

Legionella case- San Luis Obispo & Monterey County Public Health Laboratories- A Joint Investigation

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Legionella

- Legionella bacteria, normally found in soil, surface water and groundwater can grow in water, environment & plumbing systems
- *Legionella pneumophila* can cause Legionnaire's Disease (LD), pneumonia-like illness that can be fatal
- LD is on the rise in the U.S.
 - Rate of reported cases increased 5.5 times (2000 – 2017)

The case

- SLO Public Health Communicable Disease Mgr
- Christine Gaiger takes a phone call Friday morning, August 25, 2017
- Patient hospitalized in Texas with Dx of Legionnaire's Disease
- Santa Clara County resident
- Visited SLO county, stayed at a resort cabin, visited Mid-State Fair
- Patient certain that LD contracted at resort

Response 1

- This is a Friday! But Deputy HO, Lab Dir, EHS Dir and staff meet--- 10am
- EH staffer– travels to resort the same day and collects 12 samples – from the cabin rented by the LD patient and other sites on the resort property; returns and stores samples refrigerated

Sample sheet

Client Sample ID	Date/Time Sampled	Matrix	# of Samples	Client Sample ID	Date/Time	Matrix	# of Samples	Comments
1	8/25/17	Kitchen sink hot water	1	17	11938			
2	8/25/17	Kitchen faucet hot water grab	1	17	11940			
3	8/25/17	Bedroom sink swab	1	17	11941			
4	8/25/17	Bathroom head swab	1	17	11942			
5	8/25/17	Bedroom AC swab	1	17	11943			
6	8/25/17	Living Room AC swab	1	17	11944			
7	8/25/17	Refrigerator water dispenser swab	1	17	11945			
8	8/25/17	Well lab grab	1	17	11946			
9	8/25/17	Pool grab	1	17	11947			
10	8/25/17	Sea grab	1	17	11948			
11	8/25/17	Kiddie pool grab	1	17	11949			
12	8/25/17	Decorative fountain grab	1	17	11950			

Retransmitted By: *Peter Hoffman* Date: 8/26/17 Time: 8:22 AM
 Received By: *Stacy Evans* Date: 8/26/17 Time: 8:22 AM
 Retransmitted By: *Stacy Evans* Date: 8/26/17 Time: 8:40 AM

Matrix Key:
 17 = water
 18 = swab
 19 = air
 20 = soil
 21 = sediment

Comments: PCR
 Container = 5L
 Code = 9000

Response 2

- Monday, August 28
- Beebe calls Texas hospital– LD Dx by PCR, no Legionella culture performed = no pt isolate;
- 12 samples shipped overnight to Colo State PHL
- Wednesday, August 30
- Colo State PHL reports one grab sample is Legionella PCR, culture is under way
- Sample is LD pt cabin kitchen hot water

Response 3

- SLO Public Health notifies resort that the cabin hot water system must be treated to remove Legionella and three negative samples are required to demonstrate successful treatment

Response 4

- Resorts conducts treatment, collects post-treatment samples and sent to Monterey County PHL

Response 5

- MCPHL received 5 samples for Legionella testing on September 6, 2017
- Samples were collected in bottles without sodium thiosulfate to neutralize chlorine that could inactivate Legionella – not ideal
- Samples were tested anyway by Legionella culture and PCR.
- Lab suggested resort staff recollect samples using bottles with sodium thiosulfate

Response 6

- Wednesday, September 19
- Monterey County PH Lab receives 5 samples from the Resort
- All 5 samples were positive for Legionella by PCR; 2 were also positive by culture

Legionella Results Summary

Sample Date >	August 25		September 6		September 19	
	PCR	Culture	PCR	Culture	PCR	Culture
Cottage v	CoPHL	CoPHL	Monterey PHL	Monterey PHL	Monterey PHL	Monterey PHL
61			-	-	+	-
62			-	-	+	-
63			-	-	+	-
64	++	+	+	+	+	+
65			-	-	+	+

Post Testing Events

- Resort replaces hot water fixtures and retests
- October 13, 2017 SLO County Health Officer issues an order to the Resort: Units positive for L. pneumophila will remain closed until 3 separate hot water samples taken 24 hrs apart test negative
- Uncertain whether additional post remediation samples were collected to obtain 3 negative results

MCPHL: CDC ELITE Laboratory

- Environmental Legionella Isolation Techniques Evaluation Program
- ELITE certified laboratories must demonstrate successful testing proficiency
- MCPHL currently performs 3 different Legionella test methods



13

Legionella Test Methods

- Several different lab tests available for Legionella detection vary in usefulness, advantages and disadvantages
- Important to consult with lab regarding sample collection, transport and test interpretation



Culture



Latex Agglutination



PCR



IDEXX Legioert

14

14

Legionella Test Methods cont

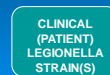
- CDC ELITE program recommends using CDC culture method plus additional testing (PCR & biochemical, antibody testing)
- PCR testing may be more sensitive; however, PCR can detect dead or injured organisms that are unable to grow on culture media
- IDEXX Legioert testing is useful for screening and monitoring
- Legionella isolated using CDC culture method can be analyzed using Whole Genome Sequencing to compare Legionella strain types

15

15

Whole Genome Sequencing to Establish Link

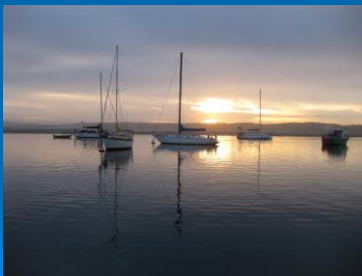
- SLO PH lab performed WGS to type Legionella strains from water samples; however, since the hospital did not obtain Legionella culture, we were unable to link strains from resort to that of patient
- Establishing links between Legionella isolated from environmental and clinical samples requires timely coordination between Environmental Health, Laboratories and Communicable Disease Experts



16

16

Questions????



17

17