Changes to tick-borne disease public health messaging in response to an emerging rickettsial pathogen

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VBDS Tick Program

Pre 1980

- Rocky Mountain Spotted fever
- Tick-borne Relapsing Fever
- Colorado Tick Fever Virus

1980

- Lyme Disease

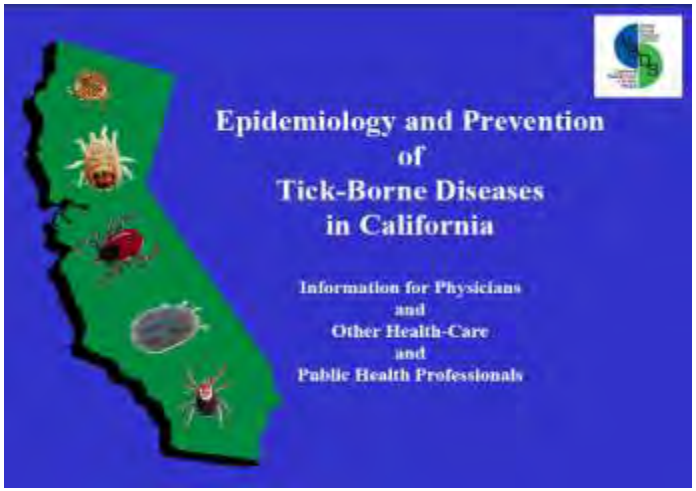
2000

- Ehrlichiosis
- Babesiosis
- Anaplasmosis
- Tularemia
- Rickettsioses (*Rickettsia* 364D)

VBDS Tick Program

- Human case reporting
- Tick surveillance
- Case investigation
- Encourage collaboration among TBD Researchers
- Coordinate Lyme Disease Advisory Committee
- Outreach

Tick-borne disease education



July 2008

- Lake County man visits ER with arm pain/swelling.
- 10 days later: full eschar ulcer
- Punch biopsy and blood taken (at ER and 27 days later)

July 2008 cont..

- IgG + : Rocky Mountain Spotted Fever (RMSF)
- Eschar +: *Rickettsia* 364D
- One *Dermacentor occidentalis* adult tick from near his house positive for *Rickettsia* 364D

Spotted Fever Group *Rickettsia*

- *Rickettsia rickettsii,* the causative agent for RMSF, is most well known, though rare in California (0 – 5 cases per year)
- Other related spotted fever group *Rickettsia* can infect humans including *Rickettsia* species 364D

  - *Rickettsia* species 364D

    - Transmitted by *Dermacentor occidentalis* (Pacific Coast tick)
    - Prevalence roughly 6% adult ticks statewide

- Tick borne transmission

Summer 2011

- Lake County:

7 yo F wakes with tick on left eyebrow

2 other ticks removed from behind her ear

Fever, muscle pain, eschar, headache

Seen at MD and CDPH notified

7/1 7/2 7/3 7/4 7/5 7/6 7/7 7/8 7/9 7/10 7/11 7/12 7/13 7/14 7/15 7/16 7/17 7/18 7/19 7/20 7/21 7/22 7/23 7/24 7/25 7/26 7/27 7/28 7/29 7/30

17 yo old brother seen and treated. Eschar found hidden in hairline.

Tick surveillance

Next Lake County case

Six Rickettsial-Associated Eschars Identified (Confirmed 364D) in California, 2008, 2011

County	Onset Date	Age, gender	Location of eschar	Known tick bite?	Presumed exposure
Lake	July, 2008	80 y.o. male	Forearm		
Lake	July 1, 2011	7 y.o. female	Above left eyebrow	Yes	Around home yard
Lake	July 19, 2011 (maybe earlier)	17 y.o. male	On neck at hairline	No tick bite recalled	"Weed-eating" around home yard
Lake	July 30, 2011 (sought medical care)	5 y.o. male	Unknown	Unknown	Unknown
Contra Costa	August 5, 2011	11 y.o. female	Back of shoulder	No tick bite recalled	Camping in yard; hiking nearby canyon
Santa Clara	September 8, 2011	Adult female	Lateral side left arm	No tick bite recalled	Walking near home

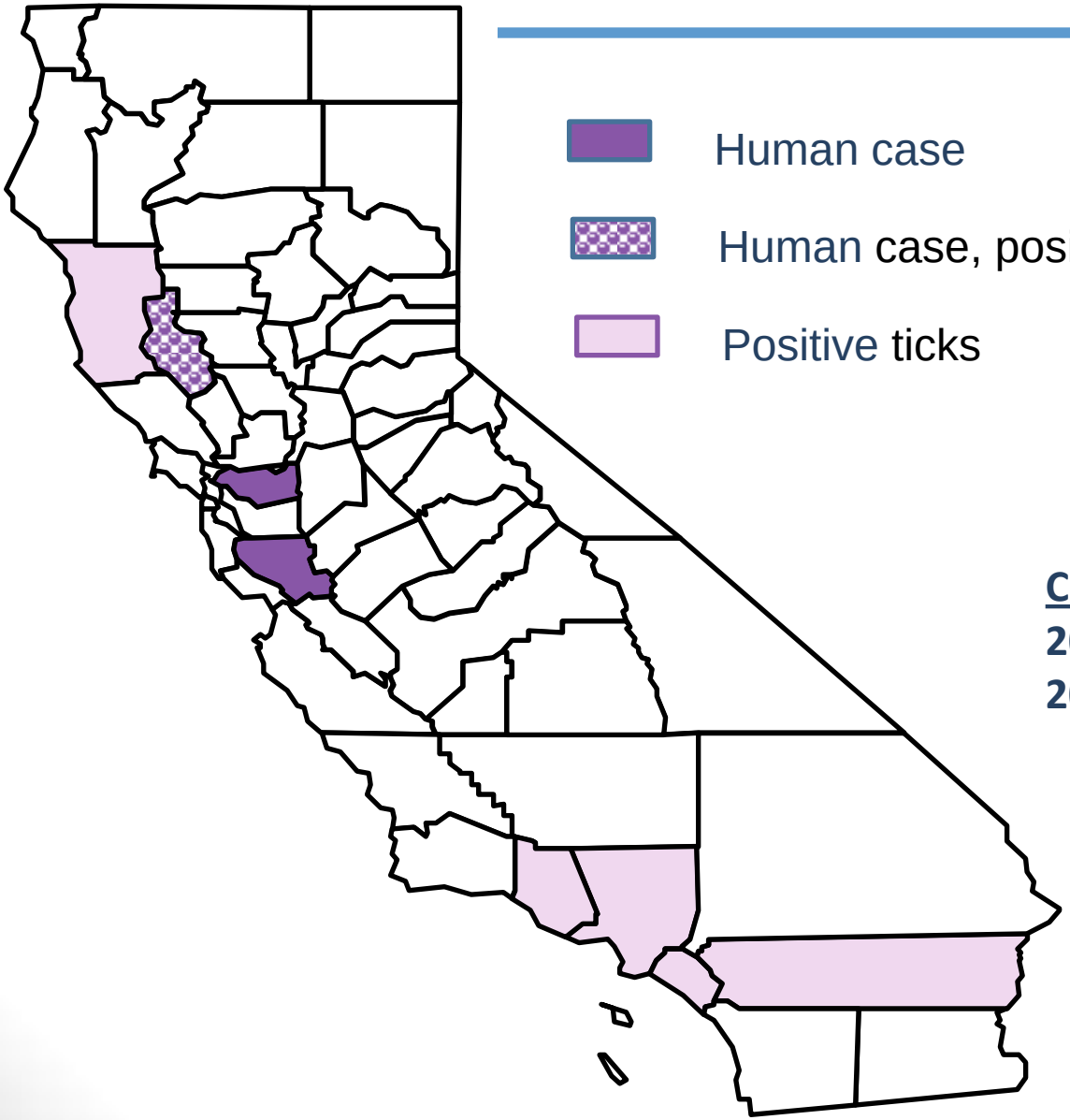
R364D: 2011 Case Summary

Case	Onset	Origin of alert to state	Serum	Eschar PCR	Known Tick bite?	Tick PCR
Lake 1	7/1	CHO	neg	POS	Yes (3-4)	POS
Lake 2	7/19	CHO	neg	POS	no	POS
Lake 3	7/30	Private physician	RMSF	POS	no	neg
Contra Costa	8/5	CHO	RMSF	POS	no	neg
Santa Clara	9/8	Private physician, anthrax initial ddx	RMSF	POS	no	neg

All cases had eschars and ticks were found at their residences. All cases resolved.

Although *Dermacentor albipictus* larvae (653), *Ixodes pacificus* larvae (8), *I. pacificus* nymphs (16), *Haemaphysalis leporispalustris* larvae (7), and *D. occidentalis* larvae (31) were found and tested only *D. occidentalis* nymphs were positive for *Rickettsia* 364D (2/28)- 7%

Distribution of SFG Rickettsia 364D Cases and Infected Ticks



Cases in California

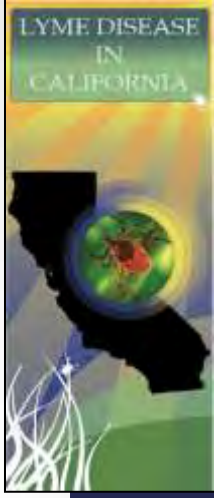
2011: 5 cases

2008: 1 case

R 364D Physician Education

- Objective: To inform physicians and health care providers about *Rickettsia* 364D in a timely and practical manner
  - Announcements to local health departments (2008 notice)
  - Physician-directed fact sheet for website posting (in progress)
  - Include in physician education presentations (in progress)

Changing public health messaging on tick borne disease



Ecology of vectors

Lyme disease

- *Ixodes pacificus* (Western black legged tick)
- Adults active: Oct-Apr
  - Wet grassy areas
- Nymphs: March-July
  - Leaf litter, wood products
- Larvae: no risk

Rickettsia 364D

- *Dermacentor occidentalis* (Pacific Coast Tick)
- Adults active: Jan-June
  - Drier grassy areas
- Nymphs: May-August
  - Same areas as *I. pacificus?*
- Larvae: Possible risk

Changing public health messaging on tick borne disease II

Transmission to humans

Lyme disease

- Attachment more than 36 hours?
- Nymph focus for prevention
  - Very small
  - 0 to >30% infected
  - Adults only 1-2%

Rickettsia 364D

- Less time? Possibly 2-20 hours (RMSF time)
- Should nymphs be the focus?
  - Same size: easy to miss
  - Small sample size but 7% infected in case follow-up
  - Adults=6%

Tick Bite Prevention

Protect Yourself from Ticks Where You Work

Occupational health powerpoint
Draft: Claudia Erickson, Health Educator

Objectives

- What are ticks?
- When can I get a tick bite (tick seasons)?
- Why it is important to prevent tick bites?
- Who is at risk for tick bites?
- How to prevent tick bites, and remove a tick

Ticks in California can transmit disease

Female western black-legged tick
Ixodes pacificus

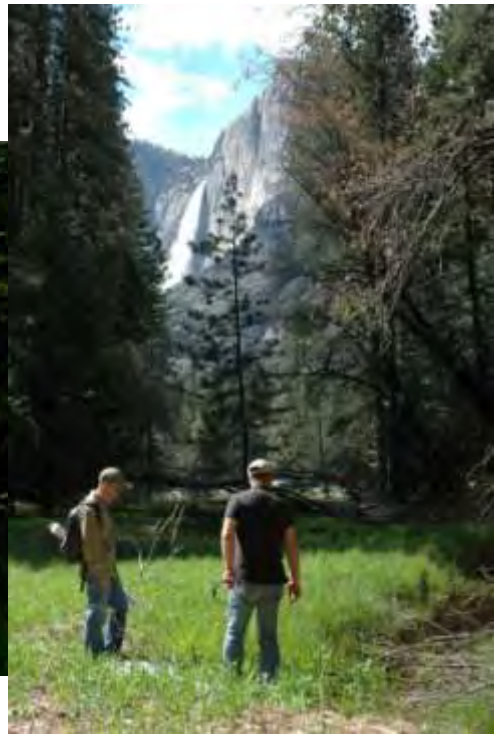
1 inch

- From left to right: adult female, adult male, nymph western black-legged tick

Female Pacific coast tick
Dermacentor occidentalis

Workers at Risk for Tick Bites

- If your job involves working outdoors where ticks are found (grassy, brushy areas; mixed hardwood forest), you may be at risk for tick bites and the diseases ticks carry.



Examples of At-Risk Occupations and Job Duties

- Construction workers
- Disaster Service Workers
- Farmers
- Foresters
- Gardeners
- Irrigation workers
- Land Surveyor
- Law Enforcement
- Park or wildlife management
- Trail construction or management
- Utility line worker

Wear the Right Gear

- Light colored protective clothing
- Long sleeves and pants
- Shirt tucked in

Use EPA-Registered Tick Repellents

Some common repellents to use on exposed skin:

- Repellent with DEET (>20%)or Picaridin

On clothing:

- Treat clothing with permethrin

While You are in Tick Habitat:

Timing is Everything!

- Check Yourself and Others Often
- Ticks are usually visible crawling up clothing
- If you find a tick on you or a co-worker, remove it promptly.

After Returning from Tick Habitat

- Wash clothing and shower soon after returning from a tick infested area
- Check yourself for ticks for 2 - 3 days after returning from tick habitat
- If you find a tick attached to you, remove it immediately.

Removing a Tick

- Cleanse the area around the tick with soap and water or antiseptic.
- Grasp the tick's mouthparts with the tweezers close to the skin.
- Using a gentle, straight-up motion, pull the tick slowly upwards.
- Apply an antiseptic to the bite site and wash your hands with soap and water.

What to Look for After a Tick Bite

Painful redness that does not expand and occurs less than 24 hours after being bitten is likely to be a local allergic reaction to the tick's saliva.

Most tick related illnesses have flu-like symptoms that develop two days to several weeks after being bitten by a tick. Tick-borne diseases can be serious if not treated.

For More Information About Ticks and Tick-borne Diseases

- Visit the California Department of Public Health Website:

http://www.cdph.ca.gov/HealthInfo/discond/Pages/TickBorneDiseases.aspx

- To see the article written specifically for outdoor workers, their supervisors, and workplace safety personnel click here:

http://www.cdph.ca.gov/HealthInfo/discond/Documents/TicksInTheWorkplaceFactSheet.pdf

- To see the CDPH Workplace Tick-bite Prevention poster click here:

http://www.cdph.ca.gov/HealthInfo/discond/Documents/OccHealthTickbitePreventionPoster.pdf

- For information on repellents: http://npic.orst.edu/ or

http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm

- For information on workplace hazards call the CDPH Occupational Health Branch Workplace Hazard Helpline at: (866) 282-5516.

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Questions??

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