

AN EPIDEMIOLOGY PUBLICATION OF THE OREGON DEPARTMENT OF HUMAN SERVICES

TICK TALK

ANY INFECTION that is typically arthropod vector-borne is reportable in Oregon.¹ With the opening of tick-questing season, this issue of the *CD Summary* reviews tick-borne diseases—vectors, clinical features, and epidemiology—in Oregon.

The table (*infra*) outlines tick-borne diseases reported in Oregon and some, which, although sighted in states directly to the north or south, have not yet been confirmed as having been acquired in Oregon. Note that reportability of some tick-borne diseases has been intermittent. Brief clinical descriptions of these diseases follow, and a map showing the distribution of hard ticks in Oregon is found on the reverse. We are unaware of published data detailing the distribution of soft ticks (specifically *Ornithodoros* spp, which transmit the agent of relapsing fever) in Oregon, but it is thought to be limited to “remote, undisturbed natural settings.”¹

LYME DISEASE

Lyme disease, caused by the spirochete *Borrelia burgdorferi*, is the most commonly reported tick-borne disease in Oregon and in the U.S. Culture of 246 deer ticks (*Ixodes pacificus*) collected in Jackson and Josephine Counties in 1997 yielded *B. burgdorferi* from 8 (3%).²

Lyme disease usually presents with the characteristic “bull’s-eye” rash known as erythema migrans (EM), accompanied by nonspecific symptoms such as fever, malaise, fatigue, headache, myalgia, and arthralgia. The incubation period from infection to onset of EM is typically 7–14 days (range, 3–32 days). Perhaps 40% of persons infected do not report a rash. Disseminated infection may be manifest as disease of the nervous system, the musculoskeletal system, or the heart.

RELAPSING FEVER

When tick-borne, this illness is caused by *Borrelia hermsii* and other *Borrelia* spp. After an incubation period of about a week (range, 4–18 days), relapsing fever begins acutely with high fever, rigors, severe headache, myalgias, arthralgias, lethargy, photophobia and cough. Patients may develop conjunctival suffusion, petechiae, and diffuse abdominal tenderness with hepatosplenomegaly. Nuchal rigidity, pulmonary rales and rhonchi, lymphadenopathy or jaundice may occur. After the first febrile episode, a truncal skin rash may develop, lasting a day or two. Febrile bouts usually last 3–7 days and are separated by afebrile periods lasting days to weeks. Up to 30% of patients develop neurological abnormalities. The untreated case-fatality rate is 2–10%, with death usually a consequence of myocarditis, cerebral hemorrhage or

Epidemiology of tick-borne diseases that may be in Oregon				
Disease	Agent	Incubation period	Vector in Oregon	Reporting in Oregon*
Babesiosis	<i>Babesia</i> spp.	1 week – 12 months	<i>Ixodes pacificus</i>	Reportable as of Mar 2002 Never confirmed in Oregon
Colorado tick fever	Colorado Tick Fever Virus (family <i>Reoviridae</i>)	Usually 4–5 days	<i>Dermacentor andersoni</i>	Reportable as of Mar 2002 and before 1987 1954–1989: 270 cases but declining sharply
Ehrlichiosis, human granulocytic	<i>E. phagocytophila</i> , <i>E. equi</i>	7–21 days	<i>Ixodes scapularis</i>	Reportable as of Mar 2002 Never confirmed in Oregon
Ehrlichiosis, human monocytic	<i>E. chaffeensis</i>	7–21 days	<i>Dermacentor andersoni</i> (?)	Reportable as of Mar 2002 Never confirmed in Oregon
Lyme disease	<i>Borrelia burgdorferi</i>	For EM, 3–32 days	<i>Ixodes pacificus</i>	Reportable as of Dec 1994 1995–2003: 145 cases
Relapsing fever	<i>Borrelia hermsii</i>	5–15 days; usually 8 days	<i>Ornithodoros hermsi</i> <i>Ornithodoros turicata</i>	Reportable as of Mar 2002 and before 1987 1978–1989: 44 cases
RMSF	<i>Rickettsia rickettsii</i>	3–14 days	<i>Dermacentor andersoni</i>	1951–2003: 93 cases
Tick paralysis	Neurotoxin	5–7 days	<i>Dermacentor andersoni</i> <i>Ixodes pacificus</i>	Not Reportable
Tularemia†	<i>Francisella tularensis</i>	1–14 days; usually 3–5 days	<i>Dermacentor andersoni</i> <i>Dermacentor variabilis</i>	1951–2003: 139 cases

*Reportability has varied over the years, but all are reportable now. Except tick paralysis, which, we forgot when we wrote the reporting rule, isn’t an infection.

†An unknown proportion are tick-borne.

*Oregon Administrative Rule 333-018-0015(5)(c); available at http://arcweb.sos.state.or.us/rules/OARs_300/OAR_333/333_018.html.



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hepatic failure. Black Butte continues to be a recognized focus of relapsing fever in Oregon. Outside of Oregon, relapsing fever can represent louse-borne infection with *B. recurrentis*.

BABESIOSIS

Babesiosis is a cosmopolitan protozoal infection of many domestic and wild mammals, particularly important in cattle. In several eastern states, especially Connecticut, Rhode Island, and Massachusetts, *Babesia microti* may be contracted via *I. scapularis* ticks. In 1991, a new strain (“WA1”) was detected in Washington and thought most likely to have been transmitted by *I. pacificus* ticks, which are prevalent throughout western Oregon.³ Infection with a closely related strain has been reported in California as well.⁴ Babesiosis has not been confirmed in Oregon, however.

RMSF

Rocky Mountain spotted fever usually presents with fever, malaise, deep muscle pain, severe headache, chills and conjunctivitis. In about half the cases, a maculopapular rash appears on the extremities on about the third day; this soon includes the palms and soles and spreads rapidly to much of the body. Petechiae and hemorrhages are common.

COLORADO TICK FEVER

Colorado tick fever (CTF) is an acute illness, characterized by biphasic fever and, infrequently, rash. After the initial fever, a brief remission is usual, followed by a second bout of fever lasting 2–3 days; neutropenia and thrombocytopenia may occur on the fourth to fifth day of fever. Encephalitis and myocarditis have also been observed.

TULAREMIA

Tularemia is most commonly transmitted by the blood or tissue of an infected animal (primarily rabbits), and can also be spread by the bite of ticks and deerflies and by drinking contaminated water. We recently reviewed clinical presentations of tularemia, along with its potential for use by terrorists.⁵

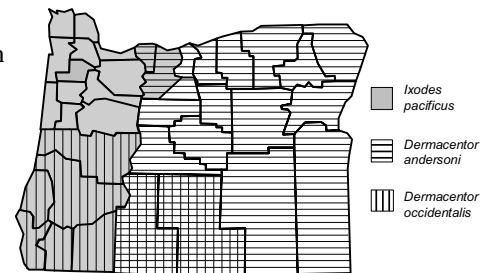
EHRlichIOSIS

Human ehrlichiosis comes in two flavors—viz., monocytic (caused by *Ehrlichia chaffeensis* and transmitted by the Lone Star tick *Amblyomma americanum*) and granulocytic (caused by the *E. phagocytophila* group and transmitted by *Ixodes* ticks). Despite what you might have read elsewhere, no confirmed cases of either type have been reported in Oregon. However, human granulocytic ehrlichiosis has been confirmed in northern California,⁶ and *I. pacificus* is found in Oregon west of the Cascades.

TICK PARALYSIS

Tick paralysis is an acute, ascending, flaccid motor paralysis that usually affects girls <10 years of age during April–June, when nymphs and mature wood ticks are most prevalent.⁷ It can be confused with Guillain-Barré syndrome, botulism, and myasthenia gravis. The pathogenesis of tick paralysis has not been fully elucidated, and pathologic and clinical effects vary by tick species.⁸ Symptoms of tick paralysis generally begin 5–7 days after a tick becomes attached (usually on the scalp), beginning with fatigue, numbness of the legs and muscle pains. Paralysis rapidly develops from the lower to the upper extremities and, if the tick is not removed, is followed by tongue and facial paralysis. Severe complications may

Distribution of Hard Ticks in Oregon



include convulsions and respiratory failure, and up to 12% of untreated cases are fatal.

CONCLUSION

Tick-borne diseases are reportable in Oregon, and most cases have occurred here during May through August. Please notify the local health department with any suspected or confirmed cases.

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