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College of Veterinary Medicine

The subject: Listeriosis

Supervision

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**Listeriosis**

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| [Listeria monocytogenes PHIL 2287 lores.jpg](http://en.wikipedia.org/wiki/File:Listeria_monocytogenes_PHIL_2287_lores.jpg)  [Listeria monocytogenes](http://en.wikipedia.org/wiki/Listeria_monocytogenes) | |
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**Listeriosis** is a [bacterial infection](http://en.wikipedia.org/wiki/List_of_infectious_diseases) most commonly caused by [*Listeria monocytogenes*](http://en.wikipedia.org/wiki/Listeria_monocytogenes),[[1]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-Sherris-1) although *L. ivanovii* and *L. grayi* have been reported in certain cases. Listeriosis primarily causes infections of the central nervous system (meningitis, meningoencephalitis, brain abscess, cerebritis) and bacteremia in those who are [immunocompromised](http://en.wikipedia.org/wiki/Immunocompromised),[[2]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-Baron-2) pregnant women, and those at the extremes of age (newborns and the elderly), as well as gastroenteritis in healthy persons who have ingested a large inoculum of the organism. *Listeria* is ubiquitous in the environment and is primarily transmitted via the oral route after ingestion of contaminated food products, after which the organism penetrates the intestinal tract to cause systemic infections. The diagnosis of listeriosis requires the isolation of the organism from the blood and/or the cerebrospinal fluid. Treatment includes prolonged administration of antibiotics, primarily ampicillin and gentamicin, to which the organism is usually susceptible.

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**Signs and symptoms**

The disease primarily affects older adults, persons with weakened immune systems, pregnant women, and newborns. Rarely, persons without these risk factors can also be affected. A person with listeriosis usually has fever and muscle aches, often preceded by diarrhea or other gastrointestinal symptoms. Almost everyone who is diagnosed with listeriosis has invasive infection (meaning that the bacteria spread from their intestines to their blood stream or other body sites). Disease may occur as much as two months after eating contaminated food.

The symptoms vary with the infected person:

* High-risk persons other than pregnant women: Symptoms can include fever, muscle aches, headache, stiff neck, confusion, loss of balance, and convulsions.
* Pregnant women: Pregnant women typically experience only a mild, flu-like illness. However, infections during pregnancy can lead to miscarriage, stillbirth, premature delivery, or life-threatening infection of the newborn.
* Previously healthy persons: People who were previously healthy but were exposed to a very large dose of Listeria can develop a non-invasive illness (meaning that the bacteria have not spread into their blood stream or other body sites). Symptoms can include diarrhea and fever.

If an animal has eaten food contaminated with Listeria and does not have any symptoms, most experts believe that no tests or treatment are needed, even for people at high risk for listeriosis.[[3]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-3)

**Cause**

[*Listeria monocytogenes*](http://en.wikipedia.org/wiki/Listeria_monocytogenes) is ubiquitous in the environment. The main route of acquisition of *Listeria* is through the ingestion of contaminated food products. *Listeria* has been isolated from raw meat, dairy products, vegetables, fruit and [seafood](http://en.wikipedia.org/wiki/Seafood). [Soft cheeses](http://en.wikipedia.org/wiki/Cheese#Classed_by_texture), unpasteurized milk and unpasteurised [pâté](http://en.wikipedia.org/wiki/P%C3%A2t%C3%A9) are potential dangers;[[1]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-Sherris-1)

Rarely listeriosis may present as [cutaneous](http://en.wikipedia.org/wiki/Cutaneous) listeriosis. This infection occurs after direct exposure to *L. monocytogenes* by intact skin and is largely confined to [veterinarians](http://en.wikipedia.org/wiki/Veterinarians) who are handling diseased animals, most often after a listerial abortion.[[4]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-4)

**Diagnosis**

[](http://en.wikipedia.org/wiki/File:Smooth_L'mono-trans.png)

*Listeria monocytogenes* grown on Biorad RAPID'L.Mono [Agar](http://en.wikipedia.org/wiki/Agar_plate)

In [CNS](http://en.wikipedia.org/wiki/Central_nervous_system) infection cases, *L. monocytogenes* can often be cultured from the blood, and always cultured from the [CSF](http://en.wikipedia.org/wiki/Cerebrospinal_fluid) (Cerebrospinal fluid). There are no reliable serological or stool tests.

**Prevention**

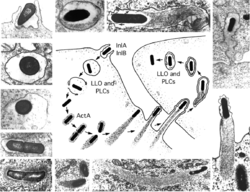
The main means of prevention is through the promotion of safe handling, cooking and consumption of food. This includes washing raw vegetables and cooking raw food thoroughly, as well as reheating leftover or ready-to-eat foods like hot dogs until steaming hot.[[5]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-CDC_Listeriosis-5)

Another aspect of prevention is advising high-risk groups such as pregnant women and immunocompromised patients to avoid unpasteurized pâtés and foods such as soft cheeses like [feta](http://en.wikipedia.org/wiki/Feta), [Brie](http://en.wikipedia.org/wiki/Brie_cheese), [Camembert cheese](http://en.wikipedia.org/wiki/Camembert_%28cheese%29), and [bleu](http://en.wikipedia.org/wiki/Bleu_cheese). [Cream cheeses](http://en.wikipedia.org/wiki/Cream_cheese), [yogurt](http://en.wikipedia.org/wiki/Yogurt), and [cottage cheese](http://en.wikipedia.org/wiki/Cottage_cheese) are considered safe. In the [United Kingdom](http://en.wikipedia.org/wiki/United_Kingdom), advice along these lines from the [Chief Medical Officer](http://en.wikipedia.org/wiki/Chief_Medical_Officer_%28United_Kingdom%29) posted in maternity clinics led to a sharp decline in cases of listeriosis in pregnancy in the late 1980s.[[6]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-6)

**Treatment**

[Bacteremia](http://en.wikipedia.org/wiki/Bacteremia) should be treated for 2 weeks, [meningitis](http://en.wikipedia.org/wiki/Meningitis) for 3 weeks, and [brain abscess](http://en.wikipedia.org/wiki/Brain_abscess) for at least 6 weeks. [Ampicillin](http://en.wikipedia.org/wiki/Ampicillin) generally is considered [antibiotic](http://en.wikipedia.org/wiki/Antibiotic) of choice; [gentamicin](http://en.wikipedia.org/wiki/Gentamicin) is added frequently for its synergistic effects. Overall mortality rate is 20–30%; of all pregnancy-related cases, 22% resulted in fetal loss or neonatal death, but mothers usually survive.[[7]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-7)

**Epidemiology**

[](http://en.wikipedia.org/wiki/File:J_Cell_Biol_2002_Aug_158(3)_409-14,_Figure_1.png)

Stages in the intracellular life-cycle of *Listeria monocytogenes*. (Center) Cartoon depicting entry, escape from a vacuole, actin nucleation, actin-based motility, and cell-to-cell spread. (Outside) Representative electron micrographs from which the cartoon was derived. LLO, PLCs, and ActA are all described in the text. The cartoon and micrographs were adapted from Tilney and Portnoy (1989).

Incidence in 2004–2005 was 2.5–3 cases per million population a year in the [United States](http://en.wikipedia.org/wiki/United_States), where pregnant women accounted for 30% of all cases.[[8]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-8) Of all nonperinatal infections, 70% occur in immunocompromised patients. Incidence in the U.S. has been falling since the 1990s, in contrast to [Europe](http://en.wikipedia.org/wiki/Europe) where changes in eating habits have led to an increase during the same time. In [Sweden](http://en.wikipedia.org/wiki/Sweden), it has stabilized at around 5 cases per annum per million population, with pregnant women typically accounting for 1–2 of some 40 total yearly cases.[[9]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-9)

There are four distinct clinical syndromes:

* Infection in pregnancy: *Listeria* can proliferate asymptomatically in the [vagina](http://en.wikipedia.org/wiki/Vagina) and [uterus](http://en.wikipedia.org/wiki/Uterus). If the mother becomes symptomatic, it is usually in the third trimester. Symptoms include [fever](http://en.wikipedia.org/wiki/Fever), [myalgias](http://en.wikipedia.org/wiki/Myalgia), [arthralgias](http://en.wikipedia.org/wiki/Arthralgias) and [headache](http://en.wikipedia.org/wiki/Headache). [Miscarriage](http://en.wikipedia.org/wiki/Miscarriage), stillbirth and preterm labor are complications of this infection. Symptoms last 7–10 days.
* Neonatal infection ([granulomatosis infantisepticum](http://en.wikipedia.org/wiki/Granulomatosis_infantisepticum)): There are two forms. One, an early-onset [sepsis](http://en.wikipedia.org/wiki/Sepsis), with *Listeria* acquired [in utero](http://en.wikipedia.org/wiki/In_utero), results in premature birth. *Listeria* can be isolated in the [placenta](http://en.wikipedia.org/wiki/Placenta), [blood](http://en.wikipedia.org/wiki/Blood), [meconium](http://en.wikipedia.org/wiki/Meconium), [nose](http://en.wikipedia.org/wiki/Human_nose), [ears](http://en.wikipedia.org/wiki/Ear), and [throat](http://en.wikipedia.org/wiki/Throat). Another, late-onset meningitis is acquired through vaginal transmission, although it also has been reported with caesarean deliveries.
* [Central nervous system](http://en.wikipedia.org/wiki/Central_nervous_system) (CNS) infection: *Listeria* has a predilection for the brain [parenchyma](http://en.wikipedia.org/wiki/Parenchyma), especially the [brain stem](http://en.wikipedia.org/wiki/Brain_stem), and the [meninges](http://en.wikipedia.org/wiki/Meninges). It can cause [cranial nerve](http://en.wikipedia.org/wiki/Cranial_nerve) palsies, [encephalitis](http://en.wikipedia.org/wiki/Encephalitis), [meningitis](http://en.wikipedia.org/wiki/Meningitis), [meningoencephalitis](http://en.wikipedia.org/wiki/Meningoencephalitis) and [abscesses](http://en.wikipedia.org/wiki/Abscess). Mental status changes are common. Seizures occur in at least 25% of patients.
* [Gastroenteritis](http://en.wikipedia.org/wiki/Gastroenteritis): *L. monocytogenes* can produce food-borne diarrheal disease, which typically is noninvasive. The median incubation period is 21 days, with diarrhea lasting anywhere from 1–3 days. Patients present with fever, muscle aches, gastrointestinal [nausea](http://en.wikipedia.org/wiki/Nausea) or [diarrhea](http://en.wikipedia.org/wiki/Diarrhea), [headache](http://en.wikipedia.org/wiki/Headache), [stiff neck](http://en.wikipedia.org/wiki/Meningism), [confusion](http://en.wikipedia.org/wiki/Confusion), loss of balance, or convulsions.

*Listeria* has also been reported to colonize the hearts of some patients. The overall incidence of cardiac infections caused by *Listeria* is relatively low, with 7-10% of case reports indicating some form of heart involvement. There is some evidence that small subpopulations of clinical isolates are more capable of colonizing the heart throughout the course of infection, but cardiac manifestations are usually sporadic and may rely on a combination of bacterial factors and host predispositions, as they do with other strains of cardiotropic bacteria.[[10]](http://en.wikipedia.org/wiki/Listeriosis#cite_note-Alonzo-10)

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