

EHRlichiosis: Notes about the Disease

North Carolina is a haven for several tickborne diseases, and the group of bacterial infections comprising ehrlichiosis is quite important in this context. Although first recognized as a human pathogen in the USA only in the mid-1980s and not made a reportable disease in NC until 1998, the real incidence of ehrlichiosis is quite likely as great as that of Rocky Mountain spotted fever (RMSF) here,¹ even though the reported morbidity does not reflect this. Like RMSF, it can result in fatalities.

Human monocytic (or monocytotropic) **ehrlichiosis** (HME), caused by *Ehrlichia chaffeensis*, is apparently the most common human form of ehrlichiosis in NC, and infections vary widely in their severity. Sometimes called “spotless spotted fever,” HME clinically resembles RMSF except for the infrequent presence of a rash in HME. *E. chaffeensis* is transmitted here by *Amblyomma americanum*, the lone star tick, so named because of the presence of a white spot in the center of the female tick’s back. Over the last several decades, *A. amblyomma* has expanded its range from coastal NC through the piedmont and is encroaching on mountain counties. Its larval, nymphal, and adult stages all readily bite humans and a variety of other mammals, particularly dogs and deer. Even lemurs in the Duke University Primate Center in Durham have been naturally infected with *E. chaffeensis*.²

Less commonly reported in NC is **human granulocytic anaplasmosis (HGA)**, formerly called **ehrlichiosis** human granulocytotropic (HGE). Although illness can be severe, HGA has a case-fatality ratio of <1%. The causative organism, *Anaplasma phagocytophilum*, has been documented and studied in NC, but much of the published research on this organism is confusing because of cross-reactivity in serologic testing between closely related ehrlichial species and its taxonomic reclassification in 2001. The vector for this disease in NC is the black-legged tick, *Ixodes scapularis*. This tick’s preference for non-human blood meals may explain the lower incidence of HGA compared with HME.

Although a third form of human ehrlichiosis, **ehrlichiosis ewingii** (caused by *Ehrlichia ewingii*) has been documented in other US states (including Tennessee), it has so far not been shown to cause human disease in NC. It primarily affects immunosuppressed patients. *E. ewingii* has been documented here in lone star ticks³ and dogs.⁴⁻⁵

A fourth form of human ehrlichiosis, **Sennetsu fever** (caused by *Neorickettsia sennetsu*), has not yet been recognized outside the Far East. The route of transmission for this mononucleosis-like disease remains to be defined.

Control of Ehrlichiosis—as with other treatable tickborne diseases—rests with both primary and secondary prevention. Reduction of tick exposure is important, but it must be combined with early treatment with an appropriate antibiotic if severe or fatal ehrlichiosis is to be avoided.

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2. CV Williams, et al., “Naturally Occurring *Ehrlichia chaffeensis* in Two Prosimian Primate Species: Ring-Tailed Lemurs (*Lemur catta*) and Ruffed Lemurs (*Varecia variegata*),” *Emerg Infect Dis* 8 (2002):1497-1500, www.cdc.gov/ncidod/EID/vol8no12/02-0085.htm.
3. L. Wolf, et al., “Prevalence of *Ehrlichia ewingii* in *Amblyomma americanum* in North Carolina,” *J Clin Microbiol* 38 (2000): 2795, jcm.asm.org/cgi/reprint/38/7/2795.
4. EE Goldman, et al., “Granulocytic Ehrlichiosis in Dogs from North Carolina and Virginia,” *J Vet Intern Med* 12, no. 2 (1998): 61-70, www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9560760&dopt=Citation.
5. SK Kordick, et al., “Coinfection with Multiple Tick-Borne Pathogens in a Walker Hound Kennel in North Carolina,” *J Clin Microbiol* 37 (1999): 2631-8, jcm.asm.org/cgi/reprint/37/8/2631.