Ehrlichiosis/Anaplasmosis

Agent(s): Bacteria belonging to the family *Anaplasmataceae*. *Ehrlichia chaffeensis* infects monocytes (a type of white blood cell involved with immune function) and causes an illness called human monocytic ehrlichiosis (HME). *E. ewingii* infects granulocytes (a different category of white blood cells) and causes a disease referred to as an *E. ewingii* infection. *Anaplasma phagocytophilum* also infects granulocytes, causing an illness called human granulocytic anaplasmosis (HGA).

Mode of Transmission: Transmitted to humans through the bite of an infected tick. *E. chaffeensis* and *E. ewingii* may infect adult and nymph stage lone star ticks and be transmitted by them. *Anaplasma phagocytophilum* may infect nymph stage and adult blacklegged ticks (deer ticks) and is primarily transmitted by the nymph stage ticks. Transmission of these pathogens occurs when an infected tick bites a person and feeds on that person (i.e., remains attached) for more than 24 hours.

Signs/Symptoms: Illness symptoms commonly include the sudden onset of fever, accompanied by one or more of the following symptoms: headache, body aches, nausea, vomiting and rash. In cases of ehrlichiosis, a rash may occur in up to 30 % of adults and 60% of children; rashes are much less common in cases of anaplasmosis. Patients may exhibit signs of thrombocytopenia (low blood platelet count) and leucopenia (low white blood cell count) and elevated liver function tests. Severe forms of illness can result in meningitis/encephalitis, bleeding disorders, difficulty breathing, organ damage and death. Persons with weakened immune systems are prone to develop more severe disease. Asplenic persons have a high risk of death.

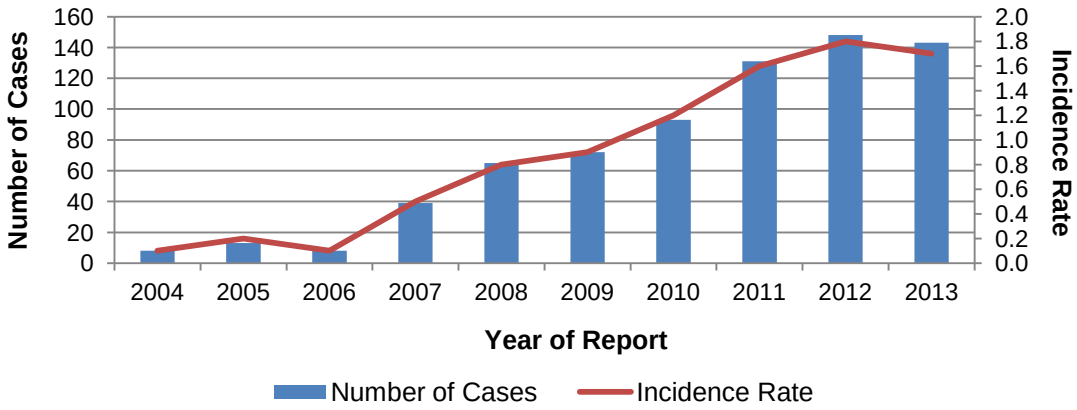
Prevention: Common practice should include minimizing tick bites by recognizing and avoiding the habitats of lone star ticks and blacklegged ticks. These habitats include humid forest environments with undergrowth or heavy leaf litter, and tall weeds and vegetative ground cover along forest margins, tree lines, forest trails and forest clearings. Repellents containing DEET, Picaridin, BioUD, IR3535, or oil of lemon eucalyptus are effective against ticks and should be applied to exposed areas of skin before entering tick habitats. When in tick-prone habitats, light-colored clothing should be worn with pants legs tucked into socks, and permethrin-based repellents should be applied to clothing, socks and shoes. After visiting tick habitats, a person should remove and wash clothing, thoroughly check all body surfaces for ticks and, if found, carefully remove attached ticks as soon as possible.

Other Important Information: Due to the many difficulties associated with diagnosis and testing of Rickettsial diseases, some cases of ehrlichiosis or anaplasmosis may be diagnosed as Rocky Mountain spotted fever (RMSF). Based on tick infection surveys, ehrlichiosis is thought to be much more common than RMSF in Virginia.

Ehrlichiosis/Anaplasmosis: 2013 Data Summary	
Number of Cases:	143
5-Year Average Number of Cases:	101.8
% Change from 5-Year Average:	+40%
Incidence Rate per 100,000:	1.7

A total of 143 cases of ehrlichiosis/anaplasmosis were reported in Virginia during 2013. This is a 3% decrease from the 148 cases seen in 2012, but is a 40% increase from the five-year average of 101.8 cases per year (Figure 13). The overall increase in reported cases over the past decade may be due to numerous factors, including increased knowledge of these diseases among healthcare providers, improvements in diagnosis and reporting, and increased tick populations. The increased tick populations result from increased deer populations, particularly in recently developed suburban areas where deer numbers are difficult to control through hunting. Adult lone star ticks and blacklegged ticks both feed primarily on deer blood for reproduction, and deer also serve as a reservoir for *E chaffeensis*. Among cases reported in 2013, 113 were specified as HME, 23 were specified as HGA, four were *E. ewingii* infections, and three were ehrlichiosis/anaplasmosis unspecified.

Figure 13. Ehrlichiosis/Anaplasmosis: Ten-Year Trend for Number of Cases and Incidence Rate, Virginia, 2004-2013



In 2013, ehrlichiosis/anaplasmosis incidence was highest in the 60 year and older age group, with 4.5 cases per 100,000, and second highest in the 50-59 year age group, with 2.4 cases per 100,000. Together, these two age groups accounted for 67% of all identified cases. From the high rates in these groups, incidence generally decreased with age, with no cases being reported in children less than 10 years of age. This pattern of age distribution, where infections occur predominantly among those over the age of 50 years, is typical of what is observed for ehrlichiosis and anaplasmosis in other endemic areas of the United States. Race information was not provided for 46% of the reported cases. Among the cases where race data were provided, incidence in the white population (1.2 per 100,000) was six times the rate in the black and "other" race populations (0.2 per 100,000, each). The incidence rate in males was higher than the rate in females (2.0 and 1.5 per 100,000, respectively).

In 2013, cases were reported from all regions of the state. The highest incidence rate (3.2 per 100,000) was seen in the southwest region, followed closely by the northwest region (3.0 per 100,000). Rates in the remaining three regions ranged from 0.8 to 1.7 cases per 100,000. Information on incidence by locality can be seen in the map below. The largest proportion of cases (48%) had symptom onset in the second quarter, while 43% had

symptom onset in the third quarter. The second and third quarters represent the spring and summer months, when ticks are most likely to feed. During 2013, one death was attributed to an *Ehrlichia chaffeensis* infection in an adult male in the 50-59 year age group who resided in the eastern region of Virginia.

Ehrlichiosis / Anaplasmosis Incidence Rate by Locality
Virginia, 2013