David N. Gaines, Speaker: Outline of Ticks and Tick-borne Disease Presentation at the VVMA Conference

My PowerPoint talk will present information about the most common tick species to bite and transmit diseases to people in Virginia. I will discuss the prevalence of lone star ticks which are, by far, the most common cause of human tick bites here, and the blacklegged tick and American dog tick which are the second and third most common cause of human tick bites. I will also list and discuss the human diseases that are associated with each of these tick species in Virginia, and the prevalence of these diseases, the seasonal occurrence and preferred environmental habitats of these ticks (i.e., where people are likely to encounter them).

Next, I will discuss Lyme disease and the Rickettsial diseases which are the most common/important tick-borne diseases of Virginia and review their clinical presentations. I will provide an overview of Lyme stages and symptoms in people, the geographic prevalence of Lyme disease in VA, and the environments/regions where it is more likely to occur. I will discuss the symptoms associated with Rickettsial diseases such as Ehrlichiosis, Anaplasmosis, Tidewater spotted fever (a.k.a., *Rickettsia parkeri*) and Rocky Mountain Spotted Fever (RMSF). I will also go into detail about the various non-pathogenic “spotted fever group Rickettsiae” that are commonly carried by ticks in Virginia and explain how exposure to these non-pathogenic *Rickettsia* causes large numbers of false laboratory positive tests for RMSF and result in a vast over-diagnosis of RMSF in human patients. I will discuss why Ehrlichiosis is the most common Rickettsial disease in Virginia, and why it is underdiagnosed.

I will discuss the issue of serological cross-reactivity among Ehrlichial agents and among spotted fever Rickettsial agents that can affect people and pets, and what the best laboratory assays are for diagnosing Rickettsial illnesses. I will present maps and a graph showing the occurrence of Ehrlichioses, Anaplasmosis and Spotted Fever Rickettsiosis in Virginia over the past decade and explain why most diagnosed cases of RMSF in human patients are probably cases of Ehrlichiosis. I will discuss the only reliable laboratory assays that can be used to identify RMSF infections. I will also discuss RMSF Transmission and how it is possible that the
driving tick behind real RMSF cases may actually be the brown dog tick, which can only be found in or near dog living habitats or on dogs. I will also touch upon the Rickettsial pathogens that are most likely to cause disease on dogs in Virginia, the tick species associated with transmission of these agents to dogs, and the problems associated with the use of serological assays for correct diagnosis of these illnesses in pets.

Next, I will discuss what people can do to prevent tick borne diseases by knowing what habitats to avoid, how the use of clothing treatments and proper methods dress before entering potential tick habitats are the most effective method of tick prevention for people. I will also cover the best strategy for applying repellents for tick prevention, and the utility of showering and doing a full body check after being in tick habitats. I will also discuss the importance of prompt removal of attached ticks and the best method to use for tick removal.

Finally, I will finish with a presentation on how to easily identify the three most common tick species that bite people in Virginia.