

HOSPITAL PHYSICIAN®

INFECTIOUS DISEASES BOARD REVIEW MANUAL

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Tick-Borne Diseases of North America

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INTRODUCTION

Ticks are bloodsucking arachnids responsible for most vector-associated human infections in North America (**Table 1**). The associated pathogens can be either protozoal, viral, or bacterial (including rickettsial and spirochetal) microbes; most infections caused by these organisms involve humans only by accident and so are classified as zoonoses. Continuing ecologic disturbance of fields and forests by outdoor sports activities and real estate development has exposed humans to various stages of ticks that normally feed on rodents, deer, or birds. Whereas many tick bites induce a small, red, pruritic lesion that drains and remains a nuisance for several weeks, others can have more serious consequences.

No tick-borne ailment has captured the recent attention of the US populace and press more than Lyme disease. This spirochete-induced disorder has increased in prevalence to the point of overdiagnosis. Rocky Mountain spotted fever (RMSF) remains a mortal threat to most human hosts, and the relatively rare, malaria-like babesiosis is occasionally responsible for the deaths of splenectomized patients. Endemic relapsing fever caused by tick bites has a unique presentation in the United States. Ehrlichial infections, however, are even more prevalent and often quite challenging to diagnose. Colorado tick fever, tick-borne encephalitis,

and tick-borne hemorrhagic fever are viral disorders that generally must be treated merely symptomatically. Finally, tick paralysis is a noninfectious toxin-mediated condition with a dramatic presentation and resolution.

Ticks having medical significance for humans are either soft or hard. Soft ticks, found mainly in arid environments, can transmit only a single known human disorder (namely, endemic relapsing fever) through *Borrelia* species such as *B. hermsii* and *B. duttonii*. Nearly all tick-related human diseases in North America involve hard ticks (the Ixodidae family of ticks). Ticks belonging to the *Ixodes* species (eg, *I. ricinus*, *I. scapularis* [commonly known as deer ticks]), have a shiny black color; the female has a red dorsal posterior. These ticks can attach to humans at all 3 stages (adult, nymph, larva) of development (**Figure 1**). *Dermacentor variabilis*, the American dog tick, is brown and white. It is larger than deer ticks and attaches to humans in the adult stage only. Finally, *Amblyomma americanum*, the Lone Star tick, is oval and black with a white spot near the center. It also can attach to humans at all 3 stages of development.

DEDICATION

Volume 7, Part 2, of the *Infectious Diseases Board Review Manual* is dedicated to the memory of J. Boyd Francis, MD.