

Dutchess County Department of Behavioral & Community Health

Tick-Borne Disease Prevention FAQ Series

PERSONAL PROTECTION MEASURES: CLOTHING

Clothing as a mechanical barrier to tick bites.

It has been suggested that appropriate dress to avoid tick bites includes long pants tucked into socks, a long-sleeved shirt tucked into pants, and the use of light colored clothing (so crawling ticks are more visible) (Piesman & Eisen, 2008). However, surveys have found that the use of protective clothing has not been adopted in a consistent and widespread manner. A study of Connecticut residents conducted between 1999 and 2004 found the majority of residents were unwilling to tuck pants into socks (Gould et al., 2008).

Summary of Scientific Evidence

The evidence and references supporting each of the following bulleted points can be found in greater detail in the text below.

- Some surveys have found there to be a protective benefit associated with the use of clothing as a mechanical barrier to tick bites, while others have not.
- One study found that light colored clothing attracted more ticks than dark colored clothing. The same study found that clothing color did not affect participant ability to find ticks crawling on clothing.
- While one field study found fewer ticks crawling on participants wearing hiking boots as compared to sneakers, another found no difference in the number of ticks found when participants wore hiking boots, sneakers, or sandals.

Evidence for Efficacy

The evidence for efficacy of protective clothing as described above is inconsistent.

A survey of Connecticut residents in the early 2000s found the use of protective clothing (long pants, long sleeved shirts, and light colored clothing) was 40% effective in the prevention of Lyme disease (Vazquez et al., 2008). Likewise, a study comparing Lyme disease serology with self-reported protective behaviors in the residents of Block Island, Rhode Island found an association between negative serology and protective clothing (Finch et al., 2014). In contrast, a case-control study conducted in 24 Lyme endemic Connecticut communities between April 2005 and November 2007 failed to find a protective benefit from wearing long pants, or wearing light colored clothing (Connally et al., 2009). Likewise a 1998 study in Chester County, PA failed to find a protective benefit from wearing long pants, tucking pants into socks, or wearing light colored clothing (Smith, Wileyto, Hopkins, Cherry, & Maher, 2001). One possible limitation of these studies is that participants who reported using protective clothing may not have done so consistently during all outdoor activities.

Light Colored versus Dark Colored Clothing

A 2005 Swedish study questions the value of wearing light colored clothing to prevent tick bites. In one part of the study a known number of ticks were placed on participants wearing either black or white clothing in order to assess if color affected participant ability to find ticks on clothing. 91% of ticks placed on light clothing were found and 93% of ticks placed on dark clothing were found. In a separate part of the study, white and black clothing was field tested in an area of high density for *I. ricinus* (the main tick vector for disease in Europe) and the number of ticks found on clothing were counted. Of all the ticks found on clothing, 62% were on light clothing and 38% were on dark clothing. The authors concluded that light clothing may attract more *I. ricinus* nymphs than dark clothing (Stjernberg & Berglund, 2005).

Footwear Selection

Since ticks quest for hosts near the ground surface, it seems reasonable that footwear selection may have an impact on tick acquisition. In one study the number of ticks acquired while walking in tick infested habitats wearing hiking boots was compared to the number acquired while wearing sneakers. Four times the number of *I. scapularis* nymphs were acquired on five minute walks while wearing sneakers than while wearing boots, and a greater number of them were found higher up on the body (pant legs) with sneakers than with boots. It should be noted that much variation exists between brands of boots and sneakers, and this study did not attempt to address those differences (Carroll & Kramer, 2001). In contrast, a 2004 study in Northern California found no difference in *Ixodes pacificus* (the primary vector for Lyme disease in California) acquisition between subjects wearing a high top hiking boot, a low cut running shoe, or a sport sandal (Lane, Steinlein, & Mun, 2004).

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