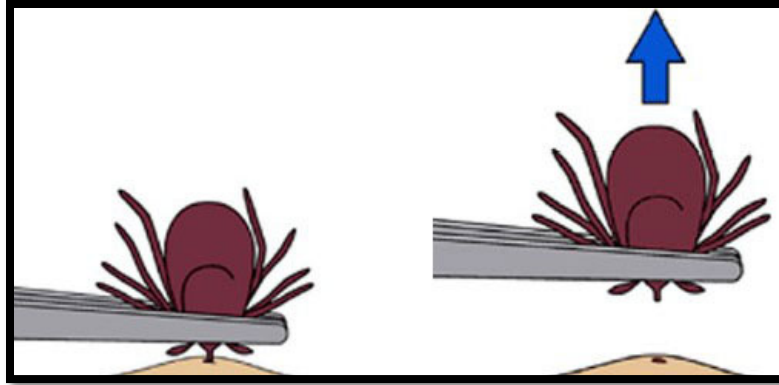


## Hey Doc – I've Been Bitten By a Tick – What Do I Do Now?

Few insect stings or arthropod bites elicit as visceral a response as tick bites. Late fall in California may herald an increase in tick-bite calls or visits by patients because this is when human-biting ticks in California are most active. These include adult western black-legged ticks (*Ixodes pacificus*), Pacific coast ticks (*Dermacentor occidentalis*), and American dog ticks (*D. variabilis*). Prompt and correct removal of an embedded tick is important to decrease the possibility of tick-transmitted diseases such as Lyme disease (transmitted by the western black-legged tick) or Rocky Mountain spotted fever (transmitted by *Dermacentor* spp. ticks), and to avoid excessive hypersensitivity or foreign body reactions such as a granuloma<sup>1</sup>.

Removing a tick is usually a straight-forward procedure that can be taught to patients, particularly if a patient is bitten frequently or cannot readily make an office visit. Medical intervention may be necessary if the tick is embedded in a sensitive or difficult-to-reach area, or if the patient lacks the necessary tools or self-confidence to remove the tick without assistance. Prompt removal is critical to decrease the possibility of disease transmission. *Rickettsia rickettsii*, the agent of Rocky Mountain spotted fever, can be transmitted soon after tick attachment and *Borrelia burgdorferi*, the agent of Lyme disease, can be transmitted a day or so after attachment<sup>2-4</sup>.

Manual removal of ticks is the best approach and simply requires a pair of medium-tipped forceps<sup>5,6</sup>; curved forceps are particularly helpful. Use gloves to protect from exposure to the tick's fluids if the tick is accidentally punctured. If possible, cleanse the area around the tick with soap and water or antiseptic solution. Using forceps, grasp the tick's mouthparts as close to the skin as possible. Using gentle, continuous traction, pull the tick slowly upwards, perpendicularly away from the skin. Do not twist or jerk the tick while pulling. Occasionally during the removal process, the body of the tick may become separated from the head, leaving the tick's mouthparts embedded in the skin. These should be removed because they can cause local irritating inflammatory reactions<sup>7</sup>. The embedded mouthparts can be removed as one would a splinter<sup>6</sup> or with a small skin punch biopsy<sup>5</sup>.



(Image courtesy of CDC)

Once removed, cleanse the bite wound with soap and water. At the medical office, the tick should be disposed of in hazardous waste or, at home, the tick can be disposed of in the trash or flushed in the toilet. If desired, it may be saved for identification by placing it in alcohol. The California Department of Public Health (CDPH) does not recommend testing a tick for the purpose of medical decision-making. Visit [CDPH's tick testing webpage](#) for more information (<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/TickTestingQA.pdf>).

The patient should be instructed to monitor for signs of tick-borne disease such as fever, rash, and flu-like symptoms up to 30 days after the tick-bite and to seek medical care in such cases. The administration of a single 200 mg dose of doxycycline to prevent Lyme disease after the bite of black-legged ticks has been suggested in highly Lyme-endemic areas<sup>8</sup>. The prophylactic value of this approach has not been studied following the bites of western black-legged ticks in California; Lyme disease epidemiology differs in the western United States from the eastern United States. Visit [CDPH's tick-borne disease epidemiology and prevalence webpage](#) for more information (<https://archive.cdph.ca.gov/HealthInfo/discond/Documents/TBDinCAEpiandPrevention.pdf>).

Some commercial tick-removal devices have been shown to be effective at facilitating the removal of ticks<sup>9-11</sup>. These devices principally have beveled slits that are designed to grasp the tick at the mouthparts close to the skin attachment site. Like the forceps procedure, the tick is then slowly and continuously pulled upwards, away from the skin, to remove it. These tools may be useful for patients often exposed to ticks or who find grasping forceps difficult.

Passive tick removal techniques such as: 1) coating the tick's body with nail polish, petroleum jelly, alcohol, or gasoline, 2) lighting the tick with a match, 3) swabbing the tick with liquid soap, or 4) injecting lidocaine at the tick attachment site, are popular lore. These techniques are based on the premise that these noxious stimuli may stop the tick's respiration and will make the tick "back out." These methods are ineffective at best<sup>6,12</sup>, dangerous at worse, and should not be used.

Patients should be reminded about the importance of tick bite avoidance and of prompt tick removal to avoid disease transmission from an infected tick. If individuals frequent areas where ticks are found, remind them to:

- Apply a repellent containing at least 20% DEET on exposed skin.
- Spray clothing, prior to wearing, with permethrin to kill ticks.
- Shower soon after returning from tick habitat to wash off any ticks.
- Place clothing worn in tick habitat in a hot dryer for 10 minutes to kill ticks.
- Perform tick checks on themselves and their pets for three days after being in an area where ticks are found.

Visit [CDPH's tick-borne diseases webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Tick-Borne-Diseases.aspx) for more information (https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Tick-Borne-Diseases.aspx).

### Reference List

- (1) Hirota K, Kurosawa Y, Goto K, Adachi K, Yoshida Y, Yamamoto O. Tick bite granuloma: Recommendations for surgical treatment. *Yonago Acta medica* 2015;58:51-52
- (2) Biggs HM, Behravesh CB, Bradley KK, et al. Diagnosis and management of tickborne rickettsial diseases: Rocky Mountain spotted fever and other spotted fever group rickettsioses, ehrlichioses, and anaplasmosis — United States. *MMWR Recomm Rep* 2016;65(No. RR-2):1–44.
- (3) Peavey CA, Lane RS. Transmission of *Borrelia burgdorferi* by *Ixodes pacificus* nymphs and reservoir competence of deer mice (*Peromyscus maniculatus*) infected by tick-bite. *J Parasitol* 1995 April;81(2):175-8.
- (4) des VF, Piesman J, Heffernan R, Schulze TL, Stafford KC, III, Fish D. Effect of tick removal on transmission of *Borrelia burgdorferi* and *Ehrlichia phagocytophila* by *Ixodes scapularis* nymphs. *J Infect Dis* 2001 March 1;183(5):773-8.
- (5) Colyar M. Tick removal techniques. *Adv Nurse Pract* 2006 May;14(5):26-7.

- (6) Roupakias S, Mitsakou P, Al Nimer A. Tick removal. *J Prev Med Hyg* 2011 February;52:40-44.
- (7) Castelli E, Caputo V, Morello V, Tomasino RM. Local reactions to tick bites. *Am J Dermatopathol* 2008 June;30(3):241-8.
- (8) Warshafsky S, Lee DH, Francois LK, Nowakowski J, Nadelman RB, Wormser, GP. Efficacy of antibiotic prophylaxis for the prevention of Lyme disease: An updated systematic review and meta-analysis. *J Antimicrob Chemother* 2010;65:1137-44
- (9) Bowles DE, McHugh CP, Spradling SL. Evaluation of devices for removing attached *Rhipicephalus sanguineus* (Acari: Ixodidae). *J Med Entomol* 1992 September;29(5):901-2.
- (10) Stewart RL, Burgdorfer W, Needham GR. Evaluation of three commercial tick removal tools. *Wilderness Environ Med* 1998;9(3):137-42.
- (11) Belli AA, Dervis E, Kar S, Ergonul O, Gargili A. Revisiting detachment techniques in human-biting ticks. *J Am Acad Dermatol* 2016 August;(75)2: 393-7
- (12) Lee MD, Sonenshine DE, Counselman FL. Evaluation of subcutaneous injection of local anesthetic agents as a method of tick removal. *Am J Emerg Med* 1995 January;13(1):14-6.

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