

# Ouch! When teeth and hands connect, bites may be beastly

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Hand injuries are frequently caused by human and animal bites, prompting as many as 330,000 emergency department visits in the United States each year. A literature review appearing in the January issue of the *Journal of the American Academy of Orthopaedic Surgeons* (JAAOS) outlines the potential complications of human and animal bites to the hand, the importance of early injury assessment, and the use of antibiotic and other treatment methods to avoid infection, permanent disability, and amputation.

"Although many people may be reluctant to immediately go to a doctor, all bites to the hand should receive medical care," said orthopaedic surgeon and lead study author Stephen A. Kennedy, MD. "And while routine antibiotics are not necessarily recommended for other bite wounds, they are recommended for a bite to the hand to reduce the risk of infection and disability."

Human bites to the hand—while accounting for only two to three percent of all hand bite injuries—can occur during altercations and include wounds caused by punching type contact with the mouth or teeth, domestic abuse, or accidentally during sports, play, or other activities. Human bites to the fingers and hand that penetrate through the skin can transmit infection through oral flora, or saliva, which contains more than 600 bacterial species.

Animals also have saliva containing a broad range of bacteria. Adult dog jaws, especially among larger breeds, are capable of exerting a bite force

of more than 300 pounds, and when combined with the variety and sharpness of their teeth—designed to clamp, hold, tear, and crush food—can cause significant injuries to hand and finger ligaments, tendons, and bones. Cats do not have the jaw strength of dogs; however, their sharp, narrow teeth also can cause serious injury. An estimated 30 percent to 50 percent of cat bites are complicated by infections, which can occur as early as three hours after injury in approximately 50 percent of the infection cases. Infections due to [dog bites](#) typically occur at less than half the rate of cat bites.

By the numbers:

- More than half of all Americans will sustain an animal bite in their lifetimes.
- Bites from domestic animals (primarily dogs) account for more than 90 percent of bites. In the United States, approximately 4.5 million people are bitten by dogs each year.
- The annual health care costs associated with cat and dog bites are estimated at more than \$850 million.

If a hand-to-mouth injury or bite occurs:

- Inspect the hand carefully for any puncture wounds. Even a small wound can inject virulent bacteria under the skin.
- If there is a puncture wound of any size, wash as soon as possible with soap and water then seek medical advice.
- If you see redness, feel increasing pain over time or see red streaking up the hand or arm (or along a tendon), these are signs of a significant infection and immediate medical attention is needed.

Prompt treatment, ideally within 24 hours of an animal or human bite, can prevent serious injury or infection:

- Symptoms of infection include erythema (redness), edema (swelling), progressive pain, and fever.
- The patient's medical, immunization, and recent antibiotic history, as well as the timing and location of injury, should be considered when determining treatment. Patients who have prosthetic joints are at risk of an infection "seeding," or anchoring, at the site of the metal, ceramic, or plastic device.
- The size and depth of the wound and the amount of devitalized (dead) tissue should be assessed along with potential damage to neurovascular structures and tendons, underlying fractures, the presence of exposed bone and/or infection, and the integrity of the joint.
- All patients with [hand](#) bites should receive antibiotic treatment, which can lower the [infection](#) rate from an average of 28 percent to 2 percent.
- Open wounds may need to be surgically irrigated and débrided (cleaned, including removal of unhealthy or dead tissue).

Provided by American Academy of Orthopaedic Surgeons

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