

OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY

ANIMAL BITES IN OREGON

If you pick up a starving dog and make him prosperous, he will not bite you.
Mark Twain (1835–1910)

Domesticated animals have become an increasingly important part of our human experience. The downside: every year >4.5 million people in the United States are bitten by a dog.¹ Almost one in five of those — about 885,000 — require medical attention; half are children.¹ This *CD Summary* reviews the epidemiology of animal bites, and attendant considerations of bacterial infection and risk of rabies.

WHO IS AT RISK?

In 2001, in the U.S. an estimated 368,245 persons were treated for dog-bite-related injuries (rate: 129.3 per 100,000 population).² The injury rate was highest for children aged 5–9 years and decreased with increasing age. Approximately 154,625 dog bites (42%) occurred among children aged ≤14 years; the rate was significantly higher for boys (293.2 per 100,000) than for girls (216.7; $p = 0.04$). For persons aged ≥15 years, the difference in rates between males (102.9) and females (88.0) was not statistically significant. The number of cases was highest during April–September, with a peak in July (11%). For persons aged ≥16 years, approximately 16,476 dog bite injuries (8%) were work-related (e.g., persons who deliver mail, packages, or food; work at an animal clinic or shelter; or do home remodeling).²

Injuries occurred most commonly to the arm/hand (45%), leg/foot (26%), and head/neck (23%). Sixty-five percent of injuries among children aged <4 years were to the head/neck region; this percentage decreased significantly with age ($p < 0.01$). Injuries to the extremities increased with age ($p < 0.01$) and accounted for 86% of injuries treated in EDs for persons aged ≥15 years. Injury diagnoses were described frequently as “dog bite” (26%); other diagnoses included puncture (40%), laceration (25%), contusion/abrasion/hematoma (6%), cellulitis/infection

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(1.5%), amputation/avulsion/crush (0.8%), and fracture/dislocation (0.4%).

Not surprisingly, having a dog in the household is associated with a higher incidence of dog bites. As the number of dogs in the home increases, so does the incidence of dog bites. Adults with ≥2 dogs in the household are five times more likely to be bitten than those living without dogs at home.³

Principles of Care: Animal Bites

- irrigation and cleansing of the wound;
- primary closure if the wound is low-risk for developing infection;
- prophylactic antibiotics for high-risk wounds or people with immune deficiency;
- rabies post-exposure treatment depending on circumstances of bite and vaccination status; see box, *verso*;
- administration of tetanus vaccine if the person has not been adequately vaccinated.

WHAT BITES OREGONIANS?

A review of animal bites reported by the local health departments identified 1,939 people who were bitten by animals in Oregon in 2013. Of the bites reported, 64% were by dogs, 25% of the bites were from cats and 2.8% from bats (Figure 1). Fifty-seven percent of bite victims were women. Of bitten males, 79% suffered dog bites, and only 18% reported cat bites; of females, 63% were bitten by dogs and 34% by cats.

Rates of reported animal bites were highest in persons age ≤9 years and from 50–69 years (Table). The vast majority of bites in children ≤9 years were by dogs (97.6%). The percentage of cat bites as well as bat bites seemed to increase with age.

Figure 1. Animal bites by species in Oregon, 2013

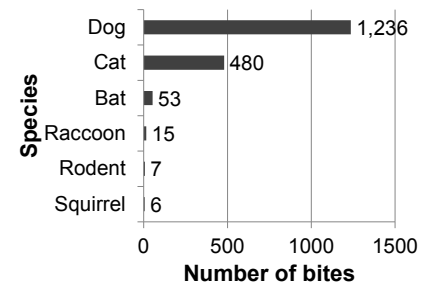


Table. Reported animal bites by age group and species, Oregon, 2013

Age group (years)	Bites/100,000	Type of bite		
		% Dog	% Cat	% Bat
0–9	56	97.6	2.4	0
10–19	37	81.6	16.7	1.7
20–29	46	68	31	1
30–39	39	71.7	27.7	0.6
40–49	39	72.4	25	2.6
50–59	52	62.4	32	5.6
60–69	71	54	42	4
70–79	46	54.7	39.6	5.7
≥80	21	48.5	51.5	0

In 2013, the 1,939 animal bites reported to the Oregon Health Authority yielded a rate of 50.3 per 100,000 persons. There was a clear seasonal pattern, with >150 bites reported each month between March and September. Dog bites drove this trend and tended to occur between March and August. Cat bites, in contrast, occurred throughout the year with a mild increase between July and September. Bat bites tend to occur between April and October and raise the spectre of rabies exposure (Figure 2, *verso*).

MEDICAL MANAGEMENT

Treatment depends on the location of the bite, the overall health condition of the bitten person and whether or not the animal had been vaccinated against rabies.

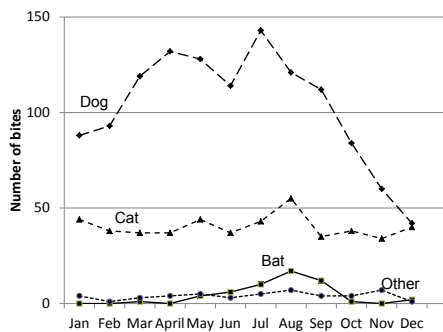
In small children, bites to the face, neck, or head are extremely hazardous. Young children and infants are often bitten in the head because their



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Figure 2. Animal bites by species and month, Oregon 2013



small stature puts their heads near dogs' mouths. Dog bites can cause fractures of the face and skull and lead to brain and nervous system infections.³ Bites to the hand, whether from cats or dogs, are potentially dangerous: they may lead to osteomyelitis or septic arthritis.⁴

In the U.S. about 1% of dog bites and about 5–10% of cat bites require hospitalization. With swift and proper care, the prognosis is usually very good. Bite management is complex, but it always begins with thorough wound cleaning and administration of tetanus vaccine if the person is not current. Decisions have to be made regarding need for antibiotics and which would be most appropriate.³ The need for rabies prophylaxis should be assessed (see box). Remember that Oregon law requires reporting of all bites of humans by mammals; friendly public health officials are standing by, ready to discuss unusual cases and the subtleties of “provoked” versus “unprovoked.”

BACTERIOLOGIC ANALYSIS

In a national study, cultures of infected wounds of 50 patients with dog bites and 57 patients with cat bites

yielded a median of 5 bacterial isolates (range, 0 to 16) at a reference laboratory. *Pasteurella* species were the most frequent isolates from both dog bites (50%) and cat bites (75%). *Pasteurella canis* was the most common isolate of dog bites, and *Pasteurella multocida* subspecies *multocida* and *septica* were the most common isolates of cat bites.⁵

Oregon Rules for Rabies

- All bats must be considered rabid until proved otherwise.
- Bites from foxes are high-risk.
- “Provoked” bites are low-risk.
- Bites from rodents and lagomorphs (rabbits, hares) are low-risk.
- Bites from adequately vaccinated animals are low-risk.
- Report animal bites within 24 hours to the local health department.

Prophylactic antibiotic treatment for bite wounds ranges between 3 and 7 days, depending on the risk of infection and depth of the wound. The regimen of choice for treating dog and cat wounds in adults is amoxicillin-clavulanate (Augmentin®) 875/125 mg orally twice a day or 500/125 mg orally three times daily. Children should be dosed at 25–50 mg/kg orally per day divided into three doses. For adults who are allergic to penicillin, prescribe clindamycin, 300 mg orally four times daily, plus a fluoroquinolone after a dog bite. Children who are allergic to penicillin can take clindamycin and trimethoprim-sulfamethoxazole.

In the case of cat bite, adult patients who are allergic to penicillin can take cefuroxime, 500 mg orally every 12 hours or doxycycline, 100 mg orally twice daily. Children with penicillin allergy can also take cefuroxime and

doxycycline, but doxycycline is contraindicated in children <8 years of age.^{6,7,8}

PREVENTION

In addition to educating children, who suffer higher rates of dog bites, prevention efforts should encourage responsible dog ownership, including training, socializing, rabies vaccination, and neutering family pets.

FOR MORE INFORMATION

- Visit the Oregon Public Health Division website: [Public Health for Veterinarians](http://public.health.oregon.gov/Veterinarians/).
- For data on rabies testing of animals in Oregon see http://public.health.oregon.gov/Diseases/Conditions/DiseasesAZ/rabies/Documents/OregonRabiesTests_2000-2013.pdf

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