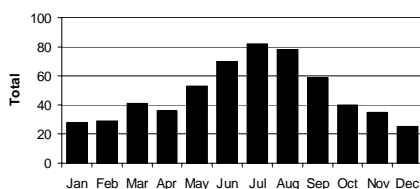


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OREGON DEPARTMENT OF HUMAN SERVICES

THOSE SUMMER BITES

ANIMAL BITES are among the endemic perils of summer, and, as usual for this time of year, our phones have been ringing off the hook (see Figure). This *CD Summary* reviews the infectious disease risks associated with animal bites. Although it is the rare animal bite that requires rabies prophylaxis, because we are asked about it so frequently we also discuss when it is indicated.

Figure 1. Animal Bites Reported to Oregon Public Health Division by Month, 2002–2006.



BITE EPIDEMIOLOGY

Although dog (and cat) ownership is common in Oregon, as anyone who has gone to the Oregon coast on a hot summer day can attest, we have few Oregon-specific data available on animal bites. Consequently we describe here what is known from national data.

Of all bite wounds in the US for which medical attention is sought, approximately 80–90% are from dogs, 5–15% from cats, and 2–5% from rodents, with the balance from other small animals (e. g., rabbits, ferrets), farm animals, monkeys, reptiles, and others.¹

Almost five million Americans are bitten by dogs each year, and the incidence of dog and cat bites has been reported as 300 bites per 100,000 population.¹⁻³ Approximately 42% of dog bites occurred

among children aged <14 years; the rate was significantly higher for boys than for girls. Case counts were slightly higher during April–September, with a peak in July (11%). For persons aged >16 years, 8% of dog-bite injuries were work-related. Overall, 98% of patients were treated and released from the ED; the remainder required hospitalization.⁴

Several dog breeds have been identified for their role in fatal attacks, including pit bulls, malamutes, chows, Rottweilers, huskies, German shepherds and wolf hybrids.^{1,2,5} From 1979 to 1988, pit bull breeds accounted for more than 41% of dog-bite-related fatalities, three times as many as German shepherds.² Rottweilers and pit bull-type dogs accounted for 67% of human injuries from dog bites in the United States during 1997–1998.

BITE INFECTIONS

Cats and Dogs

Cat bites become infected more frequently than dog bites. A dog's mouth is rich in bacteria, but only 15–20% of dog bites become infected. In contrast, approximately 30–50% of cat bites become infected.

With what do these wounds become infected? In one study, each bite had a median of 5 bacterial isolates. Both anaerobic and aerobic bacteria were isolated from 56% of the wounds; 36% of the patients had aerobes alone, and 1% anaerobes alone; 7% of cultures had no growth. *Pasteurella* species were the most frequent isolates from both dog bites (50%) and cat bites (75%);

P. canis was most common from dog bites and *P. multocida* from cat bites. Other common aerobes included *Streptococcus*, *Staphylococcus*, *Moraxella*, and *Neisseria*. Common anaerobes included *Fusobacterium*, *Bacteroides*, *Porphyromonas*, and *Prevotella*.⁶

Antibiotics are recommended for bites by **humans** or **cats** on the hand, head, neck, or genital region; puncture wounds, crush injuries, or injuries involving deeper structures, such as a bones or joints; in patients with diabetes, liver disease, etc; for bite wounds that require surgical repair; and any severe bite.

Rat and Monkey Bites

Although rat and particularly monkey bites are unusual in Oregon, no *CD Summary* would be complete without a little arcana: you never know when it will come in handy.

Rat-bite fever (RBF) is caused by either of two different organisms, *Streptobacillus moniliformis* and *Spirillum minus*. The former is the cause of almost all RBF in North America, but even that is rare in the US.⁷

Despite its name, in approximately 30% of RBF cases there is no report of a rat bite or scratch. *S. moniliformis* infection can result from merely handling infected rodents. Initial symptoms might be nonspecific, but a maculopapular rash and septic arthritis commonly develop.

Monkey bites also get infected often. Bacteria commonly infecting monkey bites include *Bacteroides* spp., *Fusobacterium* spp., streptococci, enterococci and *Eikenella corrodens*.



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Of primary concern when evaluating macaque bites are bacterial and *Herpesvirus simiae* (a.k.a. "herpes B virus") infections. Most B-virus infections have involved direct contact (bite, scratch or mucosal contact with body fluid or tissue) with macaques. Simian herpes virus can cause a rapidly progressive encephalomyelitis in infected people, with a mortality of around 70%. B-virus infection is highly prevalent (80%–90%) in adult macaques, and it must be considered a potential health hazard in all macaque bites. This risk makes macaques unsuitable as pets.⁸ Regardless of the apparent severity of the wound, medical consultation is recommended.

Antivirals, if administered early, may successfully treat the infection.⁹

TREATMENT AND RABIES RISK

Perhaps the most important step after an animal bite is the prompt and thorough cleaning of the wound with soap and water. This should be stressed, particularly to patients who call for advice about minor injuries. The need for tetanus prophylaxis should also be evaluated.

Rabies in Oregon

Because rabies can theoretically be carried by any mammal, all bites of humans by other mam-

mals are reportable to local public health officials in Oregon. That said, most mammals here carry little risk.

In Oregon, rabies is of most concern in bites by **bats** and **foxes** (See

Table 1. Rabies positivity of animals tested in Oregon, 2001–2005

Year	Bat	Fox	Cat	Dog	Other
2001	4/59	0/1	0/67	0/46	0/41
2002	12/134	2/4	0/102	0/27	0/29
2003	6/61	1/5	0/75	0/36	0/39
2004	7/88	0/2	0/105	0/42	0/27
2005	8/83	0/1	0/100	0/48	0/23
Total	37/425 (9%)	3/13 (23%)	0/449	0/199	0/159

Table. In addition, six bats have already tested positive in 2006.)

Physical contact with bats or bites by foxes may trigger a recommendation for rabies prophylaxis if the animal (or specifically, the animal's brain) is not available for rabies testing. If the animal is captured immediately, prophylaxis can be delayed until rabies testing results are reviewed.

Rabies Elsewhere

In many developing countries, bites by domestic animals still carry a substantial risk of rabies. As a result of widespread vaccination of dogs against rabies in the US, the most common source of the rabies virus is now wild animals, specifically raccoons (East Coast), skunks (Midwest, West) and bats (everywhere).

Rabies Prophylaxis

Specific anti-rabies post-expo-

sure prophylaxis (PEP), when indicated, consists of human rabies immunoglobulin (HRIG), given as soon as possible, and a vaccine series (5 doses IM in the deltoid over 28 days), initiated at the same time. Forget those hoary tales about big needles in the stomach!

There are no contraindications to PEP for exposed persons, since rabies is almost invariably fatal once contracted. However, prophylaxis should not be undertaken lightly as the biologics are expensive (\$1,500) and necessitate at least five visits to a healthcare provider.

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