the drugs taken today, then the day before, then
the day before that.

• If you add a drug, try to stop one.

By now my bias for caution with all drugs is
showing. My experience tells me it is justified.
There is one drug that can be the safest; it is
known to all good family physicians, and I will end
with a rule for that.

Each physician is a drug. With each encounter
his or her actions can do the following:
• Produce side effects.
• Exhibit a duration of action.
• Induce toxicity.
• Be indicated.
• Be contraindicated.
• Be given in an overdose.
• Be given in an underdose.
• Be given at the right interval.
• Be given at the wrong interval.
• Most of all, produce a wonderful and lasting
placebo effect.

Learn the pharmacology of being a physician.

Clifton K. Meador, MD
Nashville, Tenn

Reference
1. Lee RD. Polypharmacy: a case report and a new
protocol for management. J Am Board Fam Pract

Man's Best Friend?

The case report in this issue of the JABFP describ­
ing fulminant sepsis from a dog bite serves to re­
mind us of the family physician's responsibilities
regarding the management and prevention of dog
bites. A largely preventable epidemic looms before
us. Approximately 35 percent of American house­
holds owned a dog in 1994, and the US dog popu­
lation exceeded 52 million. The Centers for Dis­
ease Control and Prevention (CDC) estimates that
as many as 4.5 million bites occur annually, almost
800,000 of which are serious enough to require
medical attention. Bites to children represent more
than 50 percent of the total number cases. Twenty­
six percent of dog bites in children compared with
12 percent in adults require medical care. Not
only do dog bite injuries lead to serious infections,
disability, and deformity, but deaths can occur as
well. Between 1989 and 1994, 109 bite-related fa­
talities were reported, 57 percent of which were in
children younger than 10 years old. A State Farm
insurance underwriter reported that the number
of claims from dog bites increases 1 to 2 percent
each year, and in 1996 the State Farm payout for
dog bite claims went up 25 percent. In 1995 State
Farm paid $70 million on 11,000 claims and esti­
mates that the total annual insurance cost for dog
bites is about $2 billion.

In a review of 109 fatal dog attacks, among the
many breeds involved, the breeds most frequently
implicated were pit bulls, rottweilers, and German
shepherds. Dog-bite-related fatalities (18 deaths
per year in the 6-year study) remained relatively
constant compared with the rate from the previ­
ous decade. The primary difficulty in determin­
ing which breeds are most dangerous has to do
with the floating numerator (ie, numerator float­
ing without its denominator). It is important that
we know not only the percentage of bites from a
given breed but also the total number of that
breed in the general canine population and the
amount of time the dog spends around humans.
Such denominator data are unavailable. Dogs
spend a lot of time with children and in the home
and around their owners, which accounts for the
largest number of bites occurring in these set­
tings. It should come as no surprise that most
adults are bitten at home by their own dogs. Most
bites occur from dogs known by the victim, either
the family pet or a neighborhood dog. Un­
neutered male dogs are responsible for a substan­
tial number of bites.

To evaluate preventive efforts, we must con­
tinue to collect and provide accurate data to public
health and law enforcement offices, as required by
local or state ordinances. Information should in­
clude breed, sex, spay or neuter status, relation of
animal to victim, circumstances of bite, time and
location of the incident, history of previous ag­
gression, nature of restraint, vaccination and
health status of the animal (if known), and current

Submitted 17 December 1997.

From the Office of Regional Affairs and Rural Health,
WWAMI Center for Clinical Medical Education, Boise,
Idaho. Address reprint requests to James R. Blackman, MD,
Office of Regional Affairs and Rural Health, University of
Washington School of Medicine, WWAMI (Idaho) Center
for Clinical Medical Education, 777 North Raymond, Suite
WWAMI, Boise, ID 83704.
location of the animal (if known).4,8

Proper management of dog bites requires an understanding of which canine oral bacteria cause infections. The most common aerobic isolates have been α-hemolytic streptococci and Staphylococcus aureus. Anaerobic pathogens, which are found in up to 41 percent of wounds, include Bacteroides and Fusobacterium. Pasteurella multocida can be found in 25 percent of dog bite infections compared with approximately 70 percent of cat bite wounds.9

Since Butler's 1977 report regarding a new disease in man caused by an unidentified gram-negative bacillus,10 the isolated organism Capnocytophaga canimorsus has been subsequently cultured and found responsible for an increasing number of serious problems associated with dog bites or close contact with dog saliva. Most persons who contacted C canimorsus had a history of asplenia, alcoholism, or hematologic malignancy, although previously healthy individuals have become infected. It appears that the dog is a reservoir of this organism. Although an uncommon sequela of dog bites, C canimorsus infections can result in fever, malaise, myalgia, vomiting, diarrhea, abdominal pain, dyspnea, confusion, headache, and skin rash. Disseminated intravascular coagulation develops in many patients. Attention should be drawn to this organism in cases of febrile illness after dog bites or contact with dogs. Immunocompromised persons should be warned about possible serious sequelae of dog bites and should avoid direct exposure to these animals. The laboratory should be instructed to culture for C canimorsus. Cultures require prolonged incubation, and the organism can be easily overlooked. The organism might be identified more easily on peripheral blood smear.10-13

Proper wound management is required to reduce the risk of developing wound infection, sepsis, osteomyelitis, tenosynovitis, and septic arthritis. The wound should be cleaned carefully and irrigated with normal saline under pressure using a 19-gauge needle and large syringe. A 20-gauge angiographic catheter can be attached and introduced into puncture wounds to facilitate irrigation. Any devitalized tissue should be carefully debrided, and the wound inspected in detail. Because dogs can develop a tremendous force when biting, x-ray studies might be necessary to determine underlying bone and joint injury. Cultures and Gram stain are useless on a fresh wound, but they should be obtained for obviously infected wounds and victims who are already febrile or immunocompromised.14

It is useful to separate animal bites into high versus low risk when attempting to decide whether to suture the wound or provide appropriate antibiotic coverage. High-risk wounds include all human and cat bites; hand and foot wounds; wounds surgically debrided; puncture wounds; wounds involving joints, ligaments, tendons, and bones; bites with treatment delay exceeding 12 hours; and bites in immunocompromised patients. Low-risk wounds include bites involving the extremities, face, and body. High-risk wounds should not be sutured but should receive antibiotic treatment. Low-risk wounds may be sutured and do not require antibiotic treatment unless infected. Appropriate tetanus and rabies prophylaxis should be provided based on history.8,15

Dog bites to the neck and face require special considerations. Most occur in children younger than 10 years, and severe brain injury and death are most common in this age group. Most deaths occur from hemorrhage from the great vessels of the neck. The nose, mouth, and parotid region is a primary target area for dog bites.16 Carotid artery injury with delayed cerebral infarction has been reported.17 After a detailed exploration looking for damaged tissue (salivary duct, facial nerve, blood
vessels), many wounds may be closed primarily.16

Bites in older children and adults tend to occur on the extremities. Bites to the hand and foot are challenging to manage because these areas have multiple compartments that are difficult to clean. Hand and foot wounds should be treated vigorously and aggressively, with irrigation and debridement accomplished in a sterile environment. Opening loculated areas allows increased blood flow and better antibiotic penetration. These wounds should be left open.18

Given the great number of dog bites and the high proportion of victims who are children, it is clear that this potentially preventable public health problem deserves further attention by primary care providers. Anticipatory guidance should be offered to parents and older children (Table 1).2,8 Prenatal and well-child care visits provide an excellent opportunity to discuss accident prevention, including dog bites. Along with anticipatory guidance, we should support public educational efforts about responsible dog ownership and dog bite prevention, stronger animal control laws, better resources for enforcement of these laws, and better reporting of bites.

James R. Blackman, MD
Boise, Idaho

References