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EMERGENCIES

Emergency care is just that—care applied to a potentially serious condition as soon as possible while you are trying to reach your veterinarian. One of the cardinal rules in dealing with any emergency is for *you* to remain calm. If you panic, you won't be thinking clearly and you will panic your cat. Take a deep breath, quietly reassure your cat, and then do what is necessary. Don't hesitate to ask for help and remember that your cat is relying on you.

Home Emergency Medical Kit	
Container for equipment	Tweezers
Penlight	Scissors
Blanket	Grooming clippers
Rectal thermometer	Needle-nose pliers
Surgical gloves	K-Y lubricant or petroleum jelly
Cotton balls	Rubbing alcohol
Cotton swabs	Betadine or similar antiseptic scrub
Gauze pads (1 inch, 2.5 cm, square)	Hydrogen peroxide
Gauze roll (1 or 2 inches, 2.5 or 5 cm, wide)	Topical antibiotic ointment
Ace bandage (1 or 2 inches, 2.5 or 5 cm, wide)	Sterile saline eyewash
Surgical adhesive tape (½ or 1 inch, 1.5 or 2.5 cm, wide)	List of emergency phone numbers: Your veterinarian's office 24-hour emergency clinic ASPCA Animal Poison Control Center (888) 426-4435
Syringe (plastic) without a needle	
Compressed activated charcoal tables (5 grams each)	

Handling and Restraint

Any cat, no matter how docile he may be, has the potential to bite when he is severely injured, frightened, or in pain. It is important to recognize this and take proper precautions to keep from being bitten. It is therefore wise to always have control of a cat's head.

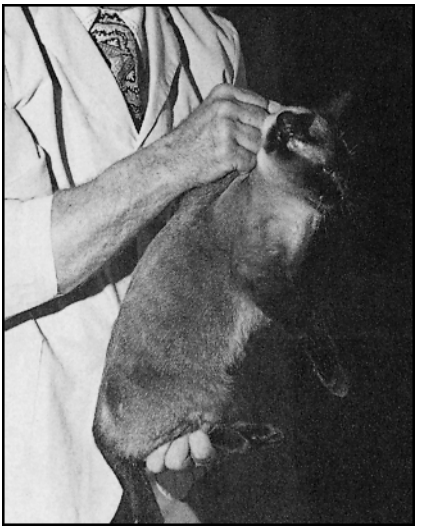
There are several effective ways to handle and restrain a cat. Your choice will depend on whether the individual animal is tranquil and cooperative or frightened and aggressive. Remember that cats have five sets of weapons—one mouth and four feet. They are extremely skilled in using these weapons, and will not hesitate to do so.

PICKING UP A CAT

As a general rule, it is advisable to reach down and pick up a cat from above. A face-to-face confrontation might provoke the cat into becoming uncooperative or aggressive.

Cooperative cats can be picked up by placing one hand around the cat beneath the chest and taking hold of the cat's front legs so they cross over each other, keeping your index finger between them for a secure grip. Pick up the cat and snuggle him close to your body, supporting his hind legs if necessary. Cradle his chin with your other hand.

To pick up an apprehensive cat, reach down and grasp him by the scruff of the neck.



Secure the back feet with your other hand.

A leash and loop restraint for an aggressive cat. The cat is immobilized by drawing the leash taut.

To keep the cat from being choked, the loop should include one front leg.

Apprehensive cats can be picked up by reaching down and lifting the cat by the scruff of his neck. Most cats under the age of 1 go limp—as they did when their mothers carried them as kittens. Older cats may not be as cooperative about scruffing. Support the cat's back feet and body with your other hand.

Frightened cats can be picked up by covering the animal with a towel. After a minute or two, as the cat becomes calmer, slide the rest of the towel underneath and lift the cat up as a bundle. This method works for aggressive cats as well, although you may want to wear thick leather gloves and use a thick blanket. It is a good idea to push a slip leash over the cat's head. This way, if he struggles and jumps out of your arms, at least he cannot completely escape.

Aggressive cats can be picked up by slipping a leash or a loop of rope over the cat's head and one front leg. Then lift the animal by the leash and set him down on a table or into a cat carrier or box. Do not attempt to lift the cat simply with a loop around his neck. This method should be used *only as a last resort* (when the method above doesn't work), because it is certain to agitate the cat further.

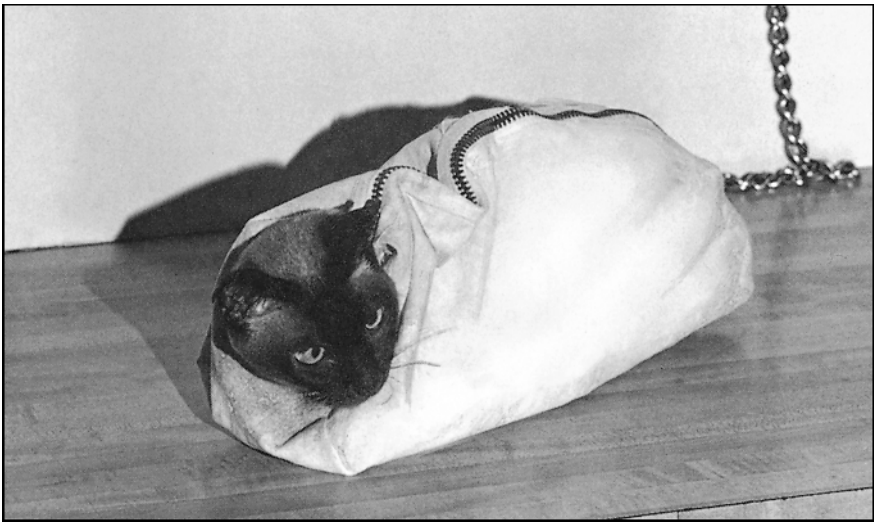
Another option is to use a small squeeze cage or squeeze box. The cat is lured into a special box that can be tightened gently around the body to allow for injections and a minimal physical exam. A fishing net can also be used to contain the cat, but beware of claws reaching through!

RESTRAINING FOR TREATMENT

When the cat is cooperative, routine procedures such as grooming, bathing, and medicating the cat are best carried out in quiet surroundings with a minimum of physical restraint. Approach the cat with confidence and handle him gently. If you are calm and go about this matter-of-factly, most cats handle moderate restraint and treatments reasonably well. Many can be coaxed into accepting the procedure and do not need to be restrained.

Cooperative cats can be lifted onto a smooth, raised surface, such as a tabletop or a high tier of a cat tree. The cat will be less secure—but still not frightened. Speak in a calm, soothing voice until the cat relaxes. Rubbing the ears and scratching the head will calm many cats. Place one hand around the front of the cat's chest to keep him from moving forward. Use your other hand to administer treatment.

Some cats are quite cooperative while being held by the scruff of the neck. However, some cats will object strenuously.



A cat bag restraint may be useful for treating the head, but some cats really hate getting into them.

Simply wrapping the cat in a towel is often the easier solution. Some veterinary hospitals transport their cats around the hospital this way.

Uncooperative cats can be handled in several ways, depending on the degree of agitation. If the cat is cooperative enough to permit handling. Some cats respond with quiet to simply having the scruff held and gently tugged back and forth or holding the scruff and gently tapping on the head as a distraction. This is more likely to be true for cats under age 1. If this is not the case, hold the scruff and press firmly against the top of the table so that the cat stretches out. These actions will prevent you from being scratched by the cat's rear claws.

When help is available, have your assistant stand behind the cat and place both hands around the cat's neck or front legs while pressing their arms against the cat's sides. Wrapping a towel or blanket around the cat has a calming effect and is useful for short procedures such as giving medication. An assistant is required to steady the cat and hold the wraps in place.

A coat sleeve makes an excellent restraint. The cat will often scoot into it willingly. Hold the end of the sleeve securely around the cat's neck. Now you can treat the head or tail.

Cat bags are special bags made for restraining cats. You place the cat on the unzipped bag, then quickly zip it around his body up to his neck. Some veterinarians really like them. However, cat bags are widely disliked by cats, and they struggle about getting into it and may not be calm once inside. An easier solution may be to simply wrap the cat in a towel.

There are also muzzles made especially for cats. These have a cloth circle to enclose the muzzle and, usually, a snap lock strap to go behind the ears.

An assistant is required to restrain a cat this way for a short procedure.

When procedures take longer and the cat cannot be managed by the methods just described, lift the cat straight up from behind by the scruff of the neck with one hand and hold his rear paws together with the other. Press down firmly on the table so the cat is lying on his side with his body extended. Now have an assistant hold the front legs together in one hand and the back legs together in the other hand, as shown in the photo on page 6.

If you don't have an assistant, you may bind the front legs together with something soft, such as a bandana, taking two or three turns below the elbows and tying it off securely. Secure the rear legs by wrapping another bandana above the hocks. Calm the cat by covering his head with a towel or cloth. Do not leave a cat alone when restrained like this.

When properly restrained, cats usually settle down and accept the treatment. Once released, most soon forget the unpleasant experience. Some cats will turn and strike as soon as they are released, however, so be prepared.

If the cat is truly upset, consider sedation for any involved treatments he needs. The risks of sedation may be minimal in a healthy cat, compared to the stress of fighting him for treatment. There are also special restraint cages, usually used by veterinarians and humane societies to handle feral or extremely agitated cats. Ask your veterinarian about these.

RESTRAINING COLLARS

An Elizabethan collar, named for the high neck ruff popular during the reign of Queen Elizabeth I of England, is a useful device to keep a cat from scratching at the ears and biting at wounds and skin problems. Older models are made of hard plastic, but newer ones are softer and more flexible, making them less annoying for the cat. These collars can be purchased from pet supply stores and some veterinarians may loan them out with a deposit. Make sure the collar is not too tight around the cat's neck.

The newer Elizabethan collars are softer and less annoying for the cat than hard plastic models.

The BiteNot collar may be more comfortable for a cat than an Elizabethan collar.

A newer option is the BiteNot collar. This high-necked collar prevents a cat from turning his head to bite. As with an Elizabethan collar, good fit is important. The collar must be just as long as the cat's neck.

Another option is a neck collar, which is simply a wide collar made of flexible cardboard that is taped around the neck. The collar should be about 2 or 3 inches (5 or 8 cm) wide, so that the cat is comfortable, but cannot bend his head and neck all the way down. Be sure to pad the area around the neck to prevent sores and irritation.

Many cats cannot or will not drink water or eat while wearing any type of restraining collar. In that case, temporarily remove the collar several times each day and monitor the cat. Cats with restraining collars must be kept indoors.

TRANSPORTING AN INJURED CAT

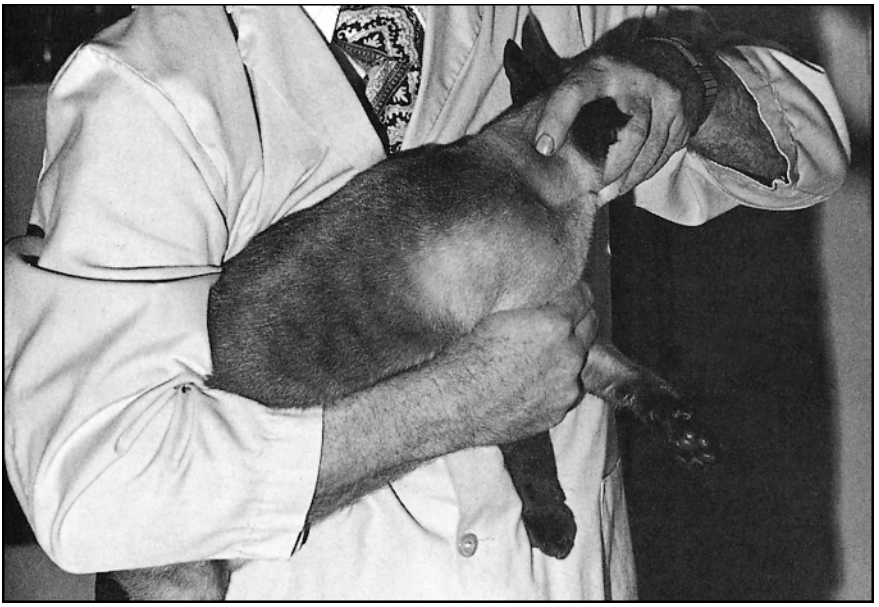
No matter how docile by basic nature, *any cat in pain may scratch or bite***.** Proper handling will prevent injuries. Furthermore, struggling can cause a weak or injured cat to tire quickly and can induce shock and collapse.

If you are able to handle the cat, pick him up as described in *Cooperative Cat* (page 2), then settle him over your hip so his rear claws project out behind you where they can do no harm. Press the inside of your elbow and forearm against the cat's side, holding him firmly against your body.

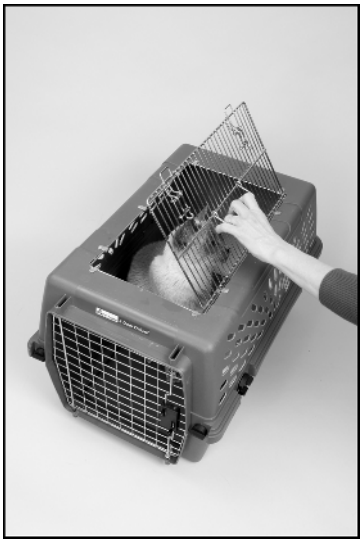
If the cat is frightened or in pain, take precautions to avoid injury. Lift the cat at once from behind by the nape of the neck, support his body underneath, and lower him into a cat carrier or a cloth bag such as a pillowcase. The material must not be airtight, or the cat will smother.

If you have a blanket or towel, throwing this over the cat and then scooping him up often works well. Make sure the cat can breathe. To transport the cat, lower him, towel and all, into a carrier or box. *Transport the cat to the veterinary hospital.*

A cat with a possible back injury should be carried on a piece of stiff cardboard or small wooden board or stretcher. Masking tape can be stretched over the cat to hold him on the stretcher or a blanket can be wrapped around the stretcher and cat to hold him securely.



If you can safely handle the injured cat, hold him firmly against your body with his rear feet pressed out behind. Cover his eyes and ears with your other hand to help calm him.



This carrier loads from the top or the side. It's a lot easier to lower an uncooperative cat in from the top than it is to push him in from the side.

If you don't have a carrier, lift the cat as described in the text on page 8 and lower him into a sack or a pillowcase.

Artificial Respiration and Heart Massage

Artificial respiration is an emergency procedure used to exchange air in an unconscious cat who's not breathing. Heart massage is used when no heartbeat can be heard or felt. When heart massage is combined with artificial respiration, it is called *cardiopulmonary resuscitation (CPR)*. When a cat stops breathing, heart function soon also stops, and vice versa. It is therefore important to know both aspects of CPR. CPR can be performed by one person, but it is easier if two people are available. One does the breathing and the other does the heart massage.

The following emergencies may require artificial respiration or CPR:

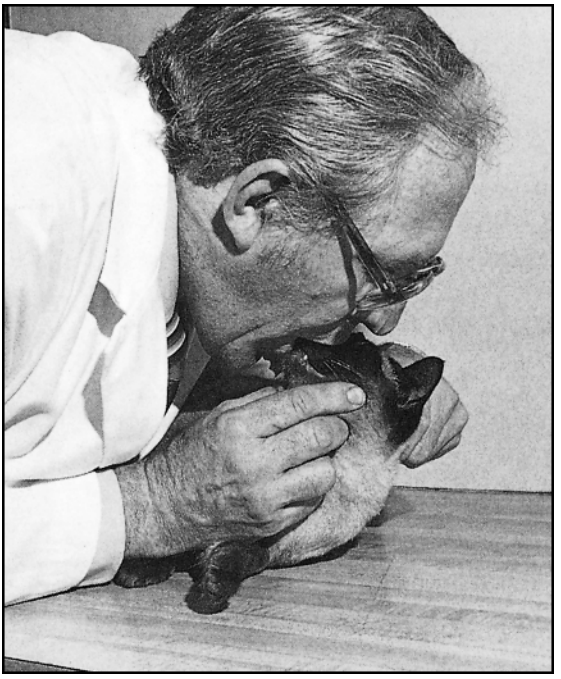
Coma
Electric shock
Head injury
Metabolic problems
Obstructed airway (choking)
Poisoning
Prolonged seizure
Shock
Sudden death
Trauma

Before you begin any emergency aid, you need to determine how much help your cat needs and of what type. If your cat is awake and resists any of this treatment, he does not need it.

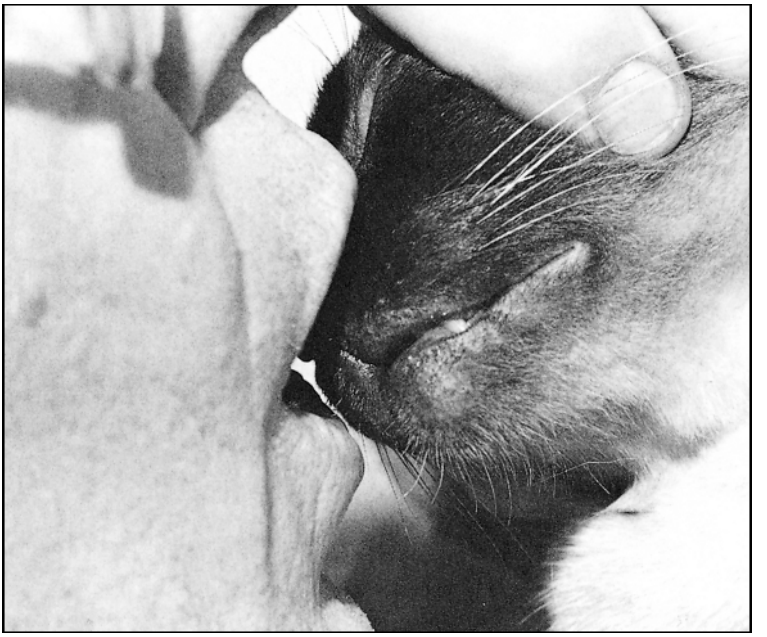
Artificial Respiration or CPR?	
Is the cat breathing? Observe the rise and fall of the chest. Feel for air against your cheek.	If **YES,** pull out the tongue and clear the airway. You may need to clear the airway by gently opening the mouth and wiping with your finger to be sure nothing is stuck or collecting in the mouth or opening to the airway, such as vomit. Observe the cat. If **NO**, feel for a pulse.
Does the cat have a pulse? Feel for the femoral artery located in the groin. Or feel the chest carefully to detect a heartbeat. Put your hand under and around the cat's chest and compress very lightly to feel for a heartbeat.	If **YES**, start artificial respiration. If **NO**, start CPR.

ARTIFICIAL RESPIRATION

1. Lay the cat on a flat surface with his *right* side down.
2. Open his mouth and clear any secretions with a cloth or handkerchief. Check for a foreign body. If present, remove it if possible. If it is impossible to reach or dislodge, perform the *Heimlich Maneuver*, described on page 33.
3. Pull the tongue forward and close the mouth. Place your mouth over the cat's nose (but not the mouth). Blow gently into the cat's nostrils. The chest will expand. Remember, *gentle* blowing—you should not be blowing hard enough to inflate a balloon.
4. Release to let the air come back out. Excess air will escape through the cat's lips, preventing overinflation of the lungs and overdistension of the stomach.
5. If the chest does not rise and fall, blow more forcefully; or, if necessary, lightly seal the lips with your hand.
6. The rate is one breath every four to five seconds (12 to 15 per minute).
7. Continue until the cat breathes on his own, or as long as the heart continues to beat.



Artificial respiration. Blow gently into the cat's nostrils.

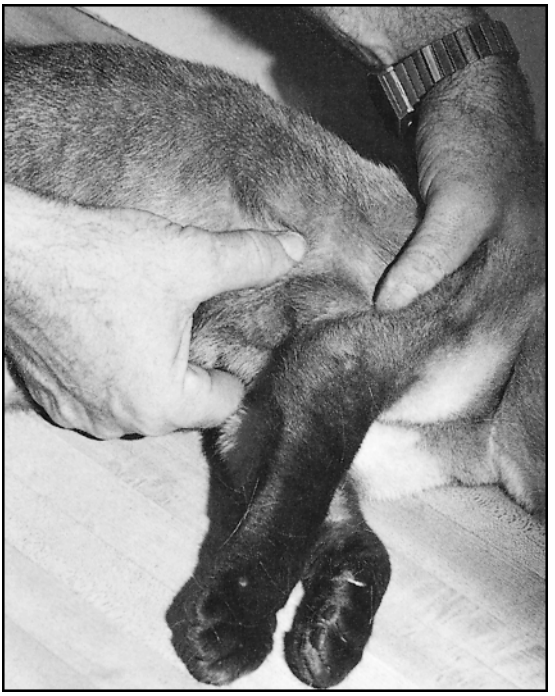


In this close view, you can see how leaving the mouth uncovered avoids the problem of overinflation.

CPR

CRP is a combination of artificial respiration and heart massage. If a cat needs heart massage, he also needs artificial respiration. On the other hand, if the cat resists your attempts to perform CPR, he probably does not need it!

1. Continue with mouth-to-nose breathing.
2. Prepare for heart massage. Place your fingers and thumb on either side of the cat's sternum or chest, behind his elbows.
3. Compress the chest firmly 6 times; administer a breath. Then repeat. Massage rate is 80 to 120 compressions per minute.
4. If possible, do not stop heart massage while administering a breath.
5. Pause every 2 minutes for 10 to 15 seconds to check for a pulse and spontaneous breathing.
6. Continue until the heart beats and the cat breathes on his own, or until no heartbeat is felt for 30 minutes.



For heart massage, place the fingers and thumb on either side of the sternum behind the cat's elbows.

Shock

Shock is caused by insufficient blood flow and oxygen to meet the body's needs. Adequate blood flow requires effective heart pumping; open, intact blood vessels; and sufficient blood volume to maintain flow and pressure. Adequate oxygenation requires an open respiratory tract and enough energy to breathe. Any condition that adversely affects the circulatory or respiratory systems, making these things impossible, can cause shock.

The cardiovascular system of an animal in shock will try to compensate for inadequate oxygen and blood flow by increasing the heart and respiratory rates, constricting the skin's blood vessels, and maintaining fluid in the circulation by reducing urinary output. This requires additional energy at a time when the vital organs aren't getting enough oxygen to carry out normal activities. After a time, shock becomes self-perpetuating. Untreated, it results in death.

Common causes of shock are dehydration (often caused by prolonged vomiting and diarrhea), heat stroke, severe infections, poisoning, and uncontrolled

bleeding. Falling from a height or being hit by a car are the most common causes of traumatic shock in cats.

Signs of early shock include panting, rapid heart rate, bounding pulse, and a bright red color to the mucous membranes of the lips, gums, and tongue. Many of these signs will be missed or considered mild—perhaps looked at as a cat who overexerted himself or is very excited. The later signs are when most owners notice and respond to their cat's condition. Signs of late shock (the ones seen most often) are pale skin and mucous membranes, a drop in body temperature, cold feet and legs, a slow respiratory rate, apathy and depression, unconsciousness, and a weak or absent pulse.

Treatment: First, evaluate. Is the cat breathing? Does he have a heartbeat? What is the extent of his injuries? Is the cat in shock? If so, proceed as follows:

1. If the cat is not breathing, proceed with *Artificial Respiration* (page 11).
2. If there is no heartbeat or pulse, administer *CPR* (page 12).
3. If the cat is unconscious, check to be sure the airway is open. Clear secretions from the mouth with your fingers. Pull out the tongue to keep the airway clear of secretions. Keep the head lower than the body.
4. Control bleeding (as described in *Wounds*, page 48).
5. To prevent further aggravating the shock:
   - Calm the cat, and speak soothingly.
   - Allow your cat to assume the most comfortable position. An animal will naturally adopt the one that causes the least pain. Do not force the cat to lie down—this may make breathing more difficult.
   - When possible, splint or support broken bones before moving the cat (see *Broken Bones*, page 16).
   - Wrap the cat in a blanket to provide warmth and to protect injured extremities. (How to handle and restrain an injured cat for transport to the veterinary hospital is discussed in *Handling and Restraint*, page 2.) Do not attempt to muzzle the cat, as this can impair breathing.
6. Head for the nearest veterinary hospital.

ANAPHYLACTIC SHOCK

Anaphylactic shock is an immediate, serious allergic reaction. It occurs when a cat is exposed to an *allergen* to which he has been sensitized. Sensitivity occurs through prior contact.

The most common drug allergen that causes anaphylactic shock is penicillin. The venom in the stings of bees and wasps can also occasionally produce anaphylactic shock. Some cats have been known to experience shock after a vaccination, although this is not common.

Anaphylactic shock causes signs and symptoms different from those described in the previous section on shock. Initially, there may be local signs at the point of contact, including pain, itching, swelling, and redness of the skin. With acute anaphylaxis, the allergic response becomes generalized, either immediately or over the course of several hours. Signs are agitation, diarrhea, vomiting, difficulty breathing, *stridor* (harsh breathing sounds) from a swollen larynx, weakness, and circulatory collapse. In untreated cases, coma and death follow.

Treatment: Emergency treatment of anaphylactic shock involves administering adrenaline (epinephrine), oxygen, antihistamines, IV fluids, and hydrocortisone—drugs that are not available at home. This is why it is best to have your veterinarian give vaccines—he or she has the drugs and equipment to treat allergic reactions in time.

A cat who has had an allergic reaction to a drug in the past should not be given that drug again. (Also see *Insect Stings*, page 43.)

Acute Painful Abdomen

An acute abdomen is an emergency that can lead to death unless treatment is started as soon as possible. The condition is characterized by the sudden onset of abdominal pain along with vomiting, retching, extreme restlessness and inability to find a comfortable position, purring, meowing, crying, grunting, and labored breathing. The abdomen is extremely painful when pressed. A characteristic position is sometimes seen in which the cat rests his chest against the floor with his rump up in the air. As the condition worsens, his pulse becomes weak and thready, his mucous membranes appear pale, and he goes into shock.

One of the following may be the cause:

- Urinary tract obstruction
- Blunt abdominal trauma (such as being kicked or hit by a car) with internal bleeding
- Rupture of the bladder
- Perforation of the stomach and/or intestines
- Poisoning
- Rupture of a pregnant uterus

A painful abdomen indicates the need for immediate veterinary attention.

- Acute peritonitis
- Intestinal obstruction

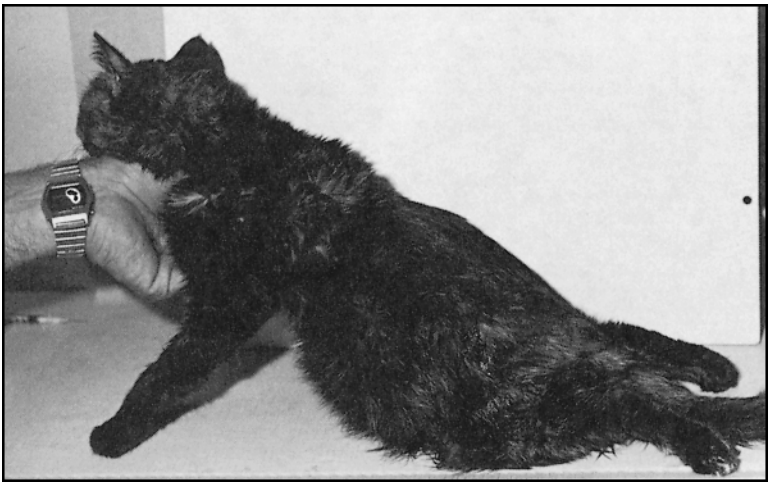
A cat with an acute abdomen is critically ill and needs *immediate* veterinary attention.

Broken Bones

Most broken bones are caused by automobile accidents and falls. Falls from apartment windows are most common in warm weather, when a screen is left open or the weight of the cat pushing on it removes the screen. The bones most commonly broken are the femur, pelvis, and jaw. Fractures of the skull and spine occur less frequently. A rather common type of fracture occurs when a car runs over a cat's tail; it is discussed in *Spinal Cord Injuries* (page 343).

Fractures are classified by type and whether the injury involves a break in the skin. Young bones tend to crack and these are called greenstick fractures, whereas the bones of elderly cats are brittle and are more likely to break.

Complete breaks are classified as open or closed. In a closed fracture, the bone does not break through the skin. In an open fracture, the bone makes contact with the outside, either because of a deep laceration exposing it or because the point of the bone protrudes through the skin. Open fractures are associated with a high incidence of bone infection.



A cat with a pelvic fracture is unable to bear weight on his rear legs. This might be confused with a spinal cord injury or arterial thromboembolism.

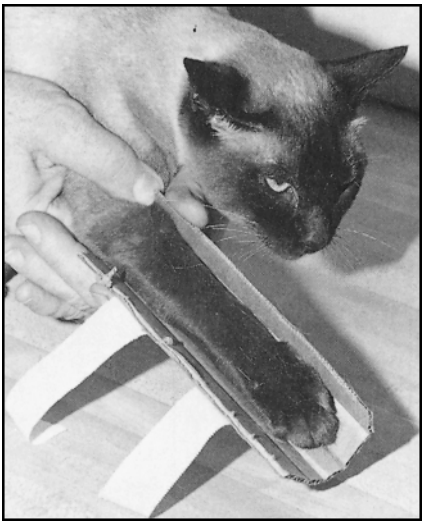
Treatment: Many of these injuries are accompanied by shock, blood loss, and injuries to other organs. Controlling shock takes precedence over treating the fracture (see *Shock*, page 15). Cats with injury or pain should be handled gently, as described in *Handling and Restraint* (page 2). Take precautions to avoid a scratch or bite.

Fractures should be immobilized to prevent further injury as you transport the cat to a veterinary hospital. Splint the involved limb. A satisfactory splint is one that crosses the joint above and below the injury. When the fracture is below the knee or elbow, immobilize the limb by folding a magazine or piece of thick cardboard around the leg. A toilet paper cardboard roll is often the right size. Then wrap it with gauze, a necktie, or tape.

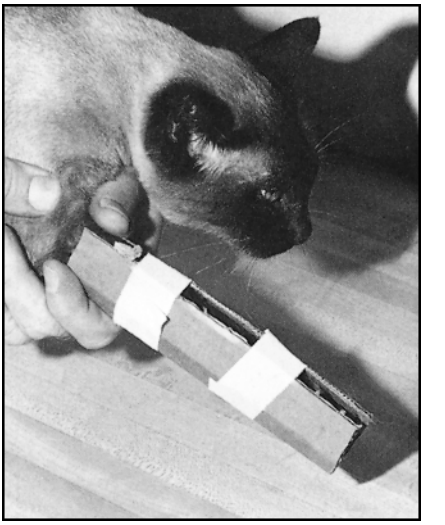
Limb fractures above the knee or elbow are immobilized by binding the leg to the body. Sometimes it is best to simply wrap the cat gently in a blanket or towel, with the injured leg close to his body. Then have someone hold the cat as still as possible while another person drives to the veterinary hospital.

If the bone is completely broken and the ends are displaced, your veterinarian will need to reduce the fracture and return the ends of the bones to their original position. Reduction is done by pulling on the limb to overcome the muscle spasm that caused the shortening. Obviously, this requires general anesthesia. Once reduced, the position of the bones must be maintained. In general, fractures above the knee or elbow are stabilized with pins and metallic plates, while those below are immobilized with splints and casts.

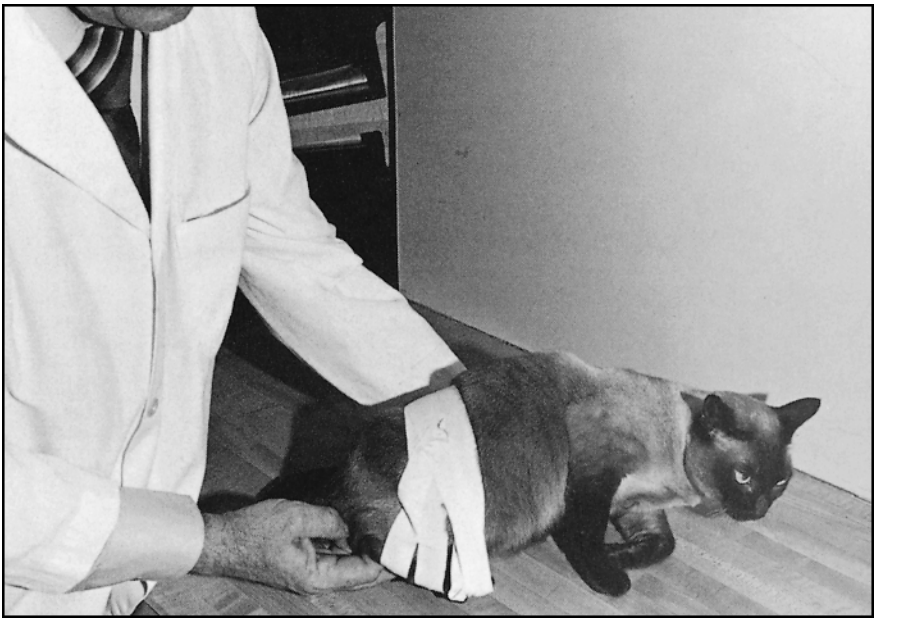
Displaced jaw fractures can cause malposition of the teeth. The jaw should be adjusted and the teeth wired together to maintain the correct position until healing is complete. Skull fractures may require surgery to elevate the depressed fragment. For more information, see *Head Injuries* (page 330).



A piece of cardboard makes a good temporary splint.



Use it for fractures of the front leg below the elbow.



Fractures above the knee joint can be immobilized by taping the leg to the body.

The fractured lower jaw shows separation of the two sides. These injuries commonly follow blows to the head.

Burns

Burns are caused by heat, chemicals, electric shocks, or radiation. Sunburn is an example of a radiation burn. It occurs on the ear flaps of cats with white coats or white noses (see *Sunburn*, page 211), and on the skin of white-coated cats who have been clipped down. A cat may be scalded by having hot liquid spilled on him or by being involved in some other household accident. A common type of burn occurs on the foot pads after walking on a hot surface such as a tin roof, stove top, or freshly tarred road.

The depth of injury depends on the length and intensity of exposure.

A first-degree burn causes the skin to become red, slightly swollen, and painful. You will see redness of the skin, occasionally blistering, perhaps slight swelling, and the burn area is tender. These superficial burns usually heal in about five to seven days.

A second-degree burn is deeper and there is blistering. These burns are extremely painful. These wounds may take up to 21 days to heal, or longer if the area gets infected.

A third-degree burn involves the full thickness of skin and extends into the subcutaneous fat. The skin appears white or leathery, the hair comes out easily when pulled, and pain is severe initially, but fades if nerve endings are

destroyed. These burns penetrate the outer layers of the skin. Since nerve endings are usually destroyed, these burns are often not as painful as second-degree ones. If more than 20 percent of the body surface is deeply burned, the outlook is poor. Fluid loss is excessive. Shock can occur and infection is likely because skin defenses are gone.

Treatment: If your cat appears to be suffering from electrical shock, use a wooden implement to slide any power cords away from him before you touch him. Alternatively, unplug all cords or turn off the circuit breakers so that you won't get a shock too.

Most burns should receive veterinary attention. Fluid loss, shock, and possible infection can be life-threatening complications of all but minor burns. *Do not* put butter or any greasy ointment on the burns. Cover with damp gauze and head to your veterinarian.

For minor burns, apply cool compresses (not ice packs) to damaged areas for 30 minutes to relieve pain. Replace as the compress becomes warm. Clip away the hair and wash the area gently with a surgical soap. Blot dry. Apply Silvadene cream or triple antibiotic ointment. Protect the area from rubbing by wrapping it with a loose-fitting gauze dressing. This bandage should be changed at least once every day so the area can be cleaned and treated. Do not using a rubbing action on damaged skin.

Treat acid, alkali, gasoline, kerosene, and other chemical burns by flushing with large amounts of water for 10 minutes. Do not let your cat groom these substances off his coat. Wear gloves and bathe the cat with mild soap and water. Blot dry and apply antibiotic ointment. Bandage loosely. If you see signs of obvious burns, such as blistering, you need to contact your veterinarian. Along with burns, some of these substances can cause toxicity.

Cats should not be allowed to groom near burned areas of skin. It may be necessary to have the cat wear an Elizabethan collar or a BiteNot collar (see page 7) to prevent grooming. Alternatively, if the area is small, it can be bandaged to keep the cat from licking it. (Mouth burns from electric cords are discussed on page 235.)

Cold Exposure

HYPOTHERMIA (LOW BODY TEMPERATURE)

Prolonged exposure to cold results in a drop in body temperature. This is most likely to occur when a cat is wet. Hypothermia also occurs with shock, after a long period under anesthesia, and in newborn kittens. (How to warm a chilled kitten is discussed in *Warming a Chilled Kitten*, page 456.) Prolonged chilling burns up the available energy in the body and predisposes the cat to low blood sugar.

The signs of hypothermia are violent shivering followed by listlessness and lethargy, a rectal temperature below 97°F (36°C), and finally, collapse and coma. Hypothermic cats can withstand extended periods of cardiac arrest because the low body temperature lowers the metabolic rate. CPR may be successful in such cases.

Treatment: Wrap your cat in a blanket or coat and carry him into the house. If the cat is wet (having fallen into icy water or been out in cold rain), give him a warm bath. Rub vigorously with towels to dry the skin.

Warm a chilled cat by applying warm water packs, wrapped in towels, to the armpits, chest, and abdomen. The temperature of the pack should be about that of a baby's bottle—warm to the wrist. Take the cat's rectal temperature every 10 minutes. Continue to change the packs until the rectal temperature reaches 100°F (37.8°C). Do not warm the cat with a hair dryer, which may cause burns.

As the cat begins to move about, give him some honey or a few spoonfuls of a glucose solution—made by adding 4 teaspoons of sugar to a pint of warm water (7 g of sugar added to 500 ml of warm water). If your cat won't drink or lick it, dab a bit of honey or Karo syrup on his gums.

FROSTBITE

Frostbite is damage to the skin and underlying tissues caused by extreme cold. It often accompanies hypothermia. It most commonly involves the toes, ears, scrotum, and tail. (Frostbite of the ear flaps is discussed on page 211.) These areas are the most exposed and are only lightly protected by fur. At first, frostbitten skin is pale and white. With the return of circulation, it becomes red and swollen. Later it may peel. Eventually, it looks much like a burn, with a line of demarcation between live and dead tissue. The dead area will turn dark and become hardened and brittle. The actual extent of the damage may not be apparent for a week or more. The dead skin separates in one to three weeks.

Treatment: Warm frostbitten areas by immersing in warm (not hot) water for 20 minutes or until the tissue becomes flushed. *Never apply snow or ice.* Tissue damage is greatly increased if thawing is followed by refreezing. Do not rub or massage the affected parts, because the damaged tissue is easily destroyed. Your cat should be taken to the veterinarian for follow-up care. Topical or oral antibiotics may be prescribed.

As sensation returns to the cold areas, they may be painful. Do not let your cat excessively groom those areas or chew on them.

Dehydration

Dehydration occurs when your cat loses body fluids faster than he can replace them. Usually it involves loss of both water and *electrolytes* (which are minerals such as sodium, chloride, and potassium). If the cat is ill, dehydration may be due to an inadequate fluid intake. Fever increases the loss of water. This becomes significant if the cat does not drink enough to offset the loss. Other common causes of dehydration are prolonged vomiting and diarrhea.

One sign of dehydration is loss of skin elasticity. When the skin along the back is pinched up into a fold, it should spring smoothly back into place. In a dehydrated cat, the skin stays up in a ridge. Another sign is dryness of the mouth. The gums, which should be wet and glistening, are dry and tacky to the touch. The saliva is thick and tenacious. Late signs are sunken eyeballs and shock.

Treatment: A cat who is noticeably dehydrated should receive prompt veterinary attention. Treatment involves replacing fluids and preventing further losses.

In mild cases without vomiting, fluids can be given by mouth. Make sure fresh, clean water is always available for your cat to drink on his own. If the cat won't drink, give him an electrolyte solution by bottle or syringe into the cheek pouch (see page XX for advice on administering liquids to your cat). Balanced electrolyte solutions for treating dehydration in children are available at drugstores. Ringer's lactate, with 5 percent dextrose in water, and Pedialyte are both suitable for cats. These solutions should only be given orally. They are given at the rate of 2 to 4 milliliters per pound (.5 k) of body weight per hour, depending on the severity of the dehydration (or as directed by your veterinarian).

Many cats will need subcutaneous or intravenous fluids administered at the veterinary hospital. Secondary kidney failure can occur as a result of severe dehydration. (Treating dehydration in infant kittens is discussed in *Common Feeding Problems*, page 466.)

Drowning and Suffocation

Conditions that prevent oxygen from getting into the lungs and blood cause asphyxiation or suffocation. These include carbon monoxide poisoning, inhaling toxic fumes (smoke, gasoline, propane, refrigerants, solvents, and others), drowning, and smothering (which can happen when a cat is left too long in an airtight space). Other causes include foreign bodies in the airways and injuries to the chest that interfere with breathing.

A cat's collar can get snagged on a fence, and the cat can strangle while struggling to get free. Be sure to provide an elastic collar that can stretch and slip over your cat's head in an emergency, or a breakaway collar with a special quick-release clasp.

Cats are natural swimmers and can negotiate short distances well. However, they can't climb out of water if the sides are steep or over a ledge. They might drown in a swimming pool if a ramp exit is not provided or if they panic and can't find the ramp and swim to exhaustion. They can also drown in a pond if they break through ice and can't get out.

The symptoms of oxygen deprivation, also called *hypoxia*, are straining to breathe, gasping for breath (often with the head extended), extreme anxiety, and weakness progressing to loss of consciousness as the cat begins to succumb. The pupils begin to dilate. The tongue and mucous membranes turn blue, also called *cyanosis*, which is a sign of insufficient oxygen in the blood.

One exception to the blue color is carbon monoxide poisoning, in which the membranes are a bright red. Carbon monoxide poisoning can be seen in cats rescued from burning buildings, trapped in car trunks, or left in a closed garage with an engine running.

Treatment: The most important consideration is to provide your cat with fresh air to breathe. (Better yet, give oxygen if it is available.) If respiration is shallow or absent, immediately give artificial respiration (see page 11). Get the cat to the nearest veterinary hospital—ideally, with one person driving while another gives respiratory support.

Carbon monoxide poisoning is frequently associated with smoke inhalation and burns of the mouth and throat. Carbon monoxide binds with hemoglobin in the blood and blocks the delivery of oxygen to the tissues. Even though the cat is breathing deeply, oxygen transport will be compromised for several hours. Breathing a high concentration of oxygen helps to overcome these effects. A veterinarian will be able to provide this therapy using an oxygen mask, a nasal tube, or an oxygen cage.

If the cat has a *pneumothorax,* an open wound into the chest (which you can determine if you hear air sucking in and out as the cat breathes), seal off the chest by pinching the skin together over the wound. Maintain this seal with a bandage wrapped around the chest or a gauze pad held firmly against the chest wound while transporting the cat to the veterinarian. For drowning, first you want to remove as much water as possible from the lungs. Hold the cat upside down by placing your hands around his lower abdomen, and gently swing the cat back and forth for 30 seconds while supporting the head. Then position the cat on his right side with the head lower than the chest and begin artificial respiration (see page 11). If there is no pulse or discernible heartbeat, heart massage should be attempted (see *CPR,* page 12). Continue efforts to resuscitate until the cat breathes without assistance or until no heartbeat is

felt for 30 minutes. Remember, cats who have been in cold water or cold temperatures can often be resuscitated even after a long time.

Once the immediate crisis is over, veterinary aid should be sought. Pneumonia from inhalation is a frequent complication.

Electric Shock

Electric shocks can be caused by chewing on power cords or coming in contact with downed wires. A shock can cause involuntary muscle contractions of the jaw that may prevent a cat from releasing the live wire. Lightning strikes are almost always fatal, and leave behind the telltale signs of singed hair and skin.

Cats who receive an electric shock may be burned, or the shock may cause an irregular heartbeat with signs of circulatory collapse. Electric current also damages the capillaries of the lungs and leads to *pulmonary edema*, which is the accumulation of fluid in the air sacs. The signs are straining to breathe, gasping for breath (often with the head extended), extreme anxiety, and weakness progressing to loss of consciousness as the cat begins to succumb. If the cat bit into a cord, you may see drooling, ulcers or burns on the lips, and coughing from lung damage.

Treatment: If your cat is found in contact with an electric cord or appliance, or downed wires, *do not touch the cat*. If possible, throw the circuit breaker or pull out the plug. Or use a wooden stick or broom handle to move the live cord away from the cat. If the cat is unconscious and is not breathing, administer artificial respiration (see page 11). Pulmonary edema must be treated by a veterinarian, and any cat with an electrical shock should be seen by a veterinarian.

Treat any burn as described in *Burns* (page 19). Mouth burns from electric cords are discussed on page 235.

Prevention: Try to move electric cords out of the way to minimize the chances of your cat playing with them. This is especially true with kittens. Try tacking the cords to the wall or enclosing them in plastic sleeves or lengths of hose.

Heat Stroke

Heat stroke is an emergency that requires immediate recognition and prompt treatment. Cats do not tolerate high temperatures as well as humans do. They sweat very minimally through their paws, and instead depend on rapid breathing to exchange warm air for cool air. Heat-stressed cats drool a great

deal and lick themselves to spread the saliva on their coats, because the evaporation of saliva is an important additional cooling mechanism. But when air temperature is close to body temperature, cooling by evaporation is not an efficient process. Cats with airway disease also have difficulty with excess heat.

Common causes of overheating or heat stroke include

- Increased environmental temperature, such as being left in a car in hot weather or being confined to a crate without water
- Airway disease that interferes with heat dissipation through rapid breathing
- Heart or lung disease that interferes with efficient breathing
- Excessive heat production caused by high fever, seizures, or strenuous exercise

Heat stroke begins with rapid, frantic, noisy breathing. The tongue and mucous membranes are bright red, saliva is thick and tenacious, and the cat often vomits. His temperature, as measured with a rectal thermometer, rises, sometimes to over 106°F (41°C). The problem is usually evident by the appearance of the cat. The condition can be confirmed by taking the animal's temperature.

If heat stroke goes untreated, the cat becomes unsteady and staggers, has diarrhea that is often bloody, and becomes progressively weaker. His lips and mucous membranes become a pale blue or gray. Collapse, coma, and death ensue.

Treatment: *Emergency measures must begin at once.* Take the rectal temperature every 10 minutes. Mild cases respond by moving the cat to cooler surroundings, such as an air-conditioned building or car. If the cat's temperature is over 106°F (39.4°C) or if the cat becomes unsteady, apply wet, cold towels to the armpits and groin, as well as on the head, or immerse the cat's body (not the head) in cool water until the rectal temperature reaches 103°F. As an alternative, wet the cat down with a garden hose. Ice packs can be applied to the head and the groin area. Stop the cooling process and dry the cat when the temperature falls below 103°F. The thermoregulatory system is not functioning normally, and further cooling may produce hypothermia.

Any cat with suspected heat stroke should be seen by a veterinarian. Delayed and secondary problems can include kidney failure, cardiac arrhythmias, and seizures. Heat stroke can also be associated with swelling of the throat. This aggravates the problem. A cortisone injection from your veterinarian may be required to treat this.

Heat stroke is an emergency. Cool the cat with a cool water spray or immerse him in a tub of cool water.

Prevention:

- Do not expose cats with airway disease or impaired breathing to prolonged heat.
- Do not leave a cat in a car with the windows closed, even if the car is parked in the shade.
- If traveling in a car, keep the cat in a well-ventilated cat carrier, or better yet, an open wire cage, so the car windows can be left open.
- Provide shade and cool water to cats who spend time outdoors in runs.
- Take extra precautions in hot, humid weather and with cats who have shortened faces and muzzles, such as Persians.

Poisoning

A poison is any substance that is harmful to the body. This includes manufactured products such as prescription drugs and cleaning solutions, and also natural herbs and other plants. Their innate curiosity may lead cats to lick or taste things that are poisonous. Fastidious grooming may cause a cat to lick poisonous products from his coat.

Animal baits are palatable poisons that encourage ingestion. This makes them an obvious choice for intentional poisoning. Cats may also be unintentionally poisoned by these products if they eat a rodent who has ingested poisoned bait. (Remember that even indoor cats may hunt and kill small prey animals—rodents, insects, or small reptiles.)

Most cases suspected of being malicious poisoning actually are not. Cats, by nature, are curious and have a tendency to explore out-of-the-way places such as wood piles, weed thickets, and storage areas. They also hunt small animals, often chasing them into confined spaces. These environments put cats into contact with insects, dead animals, and toxic plants. It also means that in many cases of suspected poisoning, the actual agent will be unknown. The great variety of potentially poisonous plants and shrubs makes identification difficult or impossible, unless you have direct knowledge that the cat has eaten a certain plant or product.

Many cases of poisoning occur in the home or in the garage. Potentially poisonous substances should be kept in secure containers and, ideally, in cupboards that close securely (remember that prying paws can open some cupboard doors). Poisonous houseplants can be removed and outdoor plants removed or fenced off from pets. Keep medications in childproof containers and inside secure cupboards.

The Top Ten Poisonings in Cats

According to the ASPCA Animal Poison Control Center, these are most common poisonings that occur among cats.

1. Permethrin insecticides designed for dogs; never use dog flea and tick products on cats!
2. Other topical insecticides; follow directions carefully.
3. Venlafaxine, a human antidepressant that goes by the brand name Effexor; apparently, cats are attracted to the capsules.
4. Glow jewelry and sticks; the liquid inside is mildly toxic.
5. Lilies; virtually all varieties of lilies can lead to kidney failure.
6. Liquid potpourri; cats may lick this or clean it off their paws after stepping in it.
7. Nonsteroidal anti-inflammatory drugs, including ibuprofen and aspirin.
8. Acetaminophen (Tylenol); even one tablet can be fatal.
9. Anticoagulant rodenticides; cats may eat these or may eat rodents who have the poison in their system.
10. Amphetamines; even very small amounts are serious.

General Treatment of Poisoning

If your cat ingests an unknown substance, it is important to determine whether that substance is a poison. Most products have labels that list their ingredients, but if the label doesn't tell you the composition and toxicity of the product, call the ASPCA Animal Poison Control Center at (888) 426-4435 for specific information. The Poison Control Center has a staff of licensed veterinarians and board-certified toxicologists on call 24 hours a day, every day of the year. You will be charged a consultation fee of $50 per case, which can be charged to most major credit cards. There is no charge for follow-up calls in critical cases. At your request, the center will also contact your veterinarian. You can also log onto www.aspca.org and click on "Animal Poison Control Center" for more information, including a list of toxic and nontoxic plants.

Other poison control hotlines include the Angell Animal Poison Control Hotline, operated by Angell Animal Medical Centers and the Massachusetts SPCA (877-226-4355, www.smspca.org) and the Animal Poison Hotline, operated by the North Shore Animal League and PROSAR International Animal Poison Center at (888) 232-8870.

In some cases, you can call the emergency room at your local hospital, which may be able to give you information about how to treat the poison. Specific antidotes are available for some poisons, but they cannot be administered unless the poison is known, or at least suspected by the circumstances. Some product labels have phone numbers you can call for safety information about their products.

When signs of poisoning develop, the most important consideration is to get your cat to the nearest emergency veterinary facility at once. If possible, find the poison and bring the container with you. This provides the emergency personnel with an immediate diagnosis and expedites treatment.

If the cat has ingested the substance recently, residual poison is often present in his stomach. An initial and most important step is to rid the cat's stomach of any remaining poison. The most effective way to empty the stomach is to pass a stomach tube, remove as much of the stomach contents as possible, and then wash the stomach out with large volumes of water. This must be done by your veterinarian.

In many cases, it is preferable to induce vomiting at the scene rather than proceed directly to the veterinary hospital. For example, if you see the cat swallow the poisonous substance, it is obviously best to make the cat vomit it right back up. Similarly, if the poison was ingested within two hours but it will take 30 minutes or longer to get to a veterinary facility, it is frequently advisable to induce vomiting at home. However,

DO NOT induce vomiting

- If the cat has already vomited
- If the cat is in a stupor, breathing with difficulty, or shows any sign of neurological involvement

- If the cat is unconscious or convulsing
- If the cat has swallowed an acid, alkali, cleaning solution, household chemical, or petroleum product
- If the cat has swallowed a sharp object that could lodge in the esophagus or perforate the stomach
- If the label on the product says, "Do not induce vomiting"

How to Induce Vomiting and Prevent Poison Absorption

Induce vomiting by giving the cat hydrogen peroxide. A 3 percent solution is most effective. Give 1 teaspoon (5 ml) hydrogen peroxide per 10 pounds (4.53 kg) body weight of the cat, with a limit of 3 teaspoons. If the cat doesn't vomit after the first dose, you may repeat every 10 minutes, up to three times, until the cat vomits. If possible, get your cat to walk around or shake him gently in your arms after giving the hydrogen peroxide. This often helps stimulate vomiting.

Once the poison has been cleared from the cat's stomach, give him activated charcoal to bind any remaining poison and prevent further absorption. The most effective and easily administered home oral charcoal product is compressed activated charcoal, which comes in 5-gram tablets (recommended for the home emergency medical kit, see page 1). The dose is one tablet per 10 pounds (4.5 kg) of body weight. Products that come in a liquid, or as a powder made into a slurry, are extremely difficult to administer at home with a syringe or medicine bottle. The slurry is dense and gooey, and few cats will swallow it voluntarily. (A few cats will eat the slurry mixed with food.) These products are best administered by stomach tube. This is routinely done by your veterinarian after flushing out the stomach.

If activated charcoal is not available, coat the intestines with milk and egg whites using ¼ cup (60 ml) egg whites and ¼ cup milk. Mix this and give the cat about 2 teaspoons (10 ml) by mouth. Administer into the cat's cheek pouch using a plastic syringe (see *How to Give Medications*, page 554), or add to food. If you use the syringe, drip the mixture in because you don't want the cat to aspirate it into his lungs, which can lead to aspiration pneumonia.

Intensive care in a veterinary hospital improves the survival rate for cats who have been poisoned. Intravenous fluids support circulation, treat shock, and protect the kidneys. A large urine output assists in eliminating the poison. Corticosteroids may be given for their anti-inflammatory effects. A cat in a coma may benefit from tracheal intubation and artificial ventilation during the acute phase of respiratory depression.

A cat who is beginning to show signs of nervous system involvement is in deep trouble. *Get your cat to a veterinarian as quickly as possible*. Try to bring a sample of vomitus or, better yet, the actual poison in the original container. Do not delay administering first aid. If the cat is convulsing, unconscious, or not breathing, administer CPR (page 12).

Seizures

Seizures caused by poisons are associated with prolonged periods of hypoxia and the potential for brain damage. Continuous or recurrent seizures are controlled with intravenous diazepam (Valium) or barbiturates, which must be administered by a veterinarian.

Seizures caused by strychnine and other central nervous system poisons may be mistaken for epilepsy. This could be a problem, because immediate veterinary attention is needed in cases of poisoning, but not for most epileptic seizures. Seizures caused by poisoning usually are continuous or recur within minutes. Between seizures the cat may exhibit tremors, lack of coordination, weakness, abdominal pain, and diarrhea. In contrast, most epileptic seizures are brief, seldom lasting more than two minutes, and are followed by a quiet period in which the cat appears dazed but otherwise normal.

See *Seizures* (page 339) for seizure care. Cats cannot swallow their tongues, so don't try to pull the tongue out while the cat is having a seizure or you risk a serious bite. Wrapping the cat in a towel or blanket may help keep him quiet and out of harm during the seizure.

Contact Poisons

If your cat has a poisonous substance on his skin or coat, flush the area with large amounts of lukewarm water for 30 minutes. Wearing gloves, give the cat a complete bath in *lukewarm,* not cold, water, as described on page 124. Even if the substance is not irritating the skin, it must be removed. Otherwise, the cat will likely lick it off and swallow it. Soak gasoline and oil stains with mineral or vegetable oil (do not use paint thinner or turpentine). Work in well. Then wash the cat with a mild soap. Rub in cornstarch or flour to absorb any residual oils, then brush it out.

DRUG POISONING

Unintentional overdose with veterinary medications and accidental ingestion of both human and veterinary pills are a common cause of poisoning in all pets. Veterinary products, in particular, are often flavored to encourage a pet to take them, and will be eagerly consumed if they are discovered. Curious cats are often attracted to dropped or rolling pills and may chase and try to eat them.

Many people give over-the-counter medications to their cats, without veterinary approval, to treat a variety of symptoms; they believe that what works for people works for cats. Unfortunately, this is not true. Cats are unusually sensitive to many medications. Drugs given to cats in human dosages are almost always toxic—and some human drugs cannot be given to cats in any amount.

Common pain relievers such as ibuprofen (Advil) and acetaminophen (Tylenol) are very toxic to cats. Cats do not have the necessary enzymes to

detoxify and eliminate these drugs. Specifically, they are lacking the liver enzyme glucuronyl transferase. This enzyme breaks down drugs so they can be metabolized. Without it, ingesting certain drugs can lead to the accumulation of dangerous substances in the animal that are left behind when the drugs are metabolized. Symptoms develop quickly and include abdominal pain, salivation, vomiting, and weakness.

Other human drugs that produce a variety of toxic effects and are commonly involved in accidental poisonings include antidepressants, antihistamines, nonsteroidal pain relievers, sleeping pills, diet pills, heart pills, blood pressure pills, and vitamins.

Treatment: All instances of drug ingestion should be taken seriously. If you suspect your pet has swallowed any drug, immediately induce vomiting and coat the bowel as described on page 29. Call your veterinarian for further instructions. A specific antidote may be available for the drug in question. Also call a poison control center (see page 28).

Prevention: All medications should be safely stored in childproof containers and in closed cupboards. Always consult your veterinarian before administering any medication. Follow instructions exactly for frequency and dosage. *Never assume that a human drug is safe for pets!*

ANTIFREEZE

Poisoning by antifreeze that contains ethylene glycol is one of the most common small animal toxicities. Exposure typically occurs when antifreeze drips from the car radiator and is lapped up by the cat.

The poison primarily affects the brain and the kidneys. Signs of toxicity are dose-related, and occur within 30 minutes and up to 12 hours after ingestion. They include depression, vomiting, an uncoordinated "drunken" gait, and seizures. Coma and death can occur in a matter of hours. Cats who recover from acute intoxication frequently develop kidney failure one to three days later. Death is common.

Treatment: If you see or suspect that your pet has ingested even a small amount of antifreeze, immediately induce vomiting (see page 29) and take your cat to the veterinarian. If treatment will be delayed, administer activated charcoal (see page 29) to prevent further absorption of ethylene glycol. Cats should be placed on IV fluids and given ethanol therapy to prevent the metabolism of ethylene glycol. Intensive care in an animal hospital may prevent kidney failure. Some veterinary referral centers may offer dialysis as part of the cat's treatment.

Prevention: This common cause of pet and child poisoning can be prevented by keeping all antifreeze containers tightly closed and properly stored, preventing spills, and properly disposing of used antifreeze. A new generation of antifreeze products contains propylene glycol rather than ethylene glycol.

The U.S. Food and Drug Administration has labeled propylene glycol as "generally recognized as safe," which means it can be added to foods. However, that is in small amounts and only for people. Cats should not consume this either. Ingesting propylene glycol antifreeze can cause lack of coordination and, possibly, seizures, but is unlikely to be fatal.

RODENT POISONS

Common rat and mouse poisons include anticoagulants and hypercalcemic agents. Both can be deadly if your cat ingests them and, in some cases, if he eats a rodent who has these poisons in its system.

Anticoagulants

Anticoagulant rat and mouse poisons are the most commonly used household poisons. These products account for a large number of accidental poisonings in cats and dogs. Anticoagulants block the synthesis of vitamin K-dependent coagulation factors, which are essential for normal blood clotting.

Observable signs of poisoning do not occur until several days after ingestion. The cat may become weak and pale from blood loss, have nosebleeds, vomit blood, have rectal bleeding, develop *hematomas* and bruises beneath the skin, or have hemorrhages beneath the gums. The cat may be found dead from bleeding into the chest or abdomen.

There are two generations of anticoagulants, both in current use. The first-generation anticoagulants are cumulative poisons that require multiple feedings over several days to kill the rodent. These poisons contain the anticoagulants warfarin and hydroxycoumarin.

Second-generation anticoagulants contain bromadiolone and brodifacoum, poisons that are 50 to 200 times more toxic than warfarin and hydroxycoumarin. These products are more dangerous to pets and are capable of killing rodents after a single feeding. It is possible for a cat to be poisoned by eating a dead rodent with residual poison in its stomach.

Closely related to the second-generation anticoagulants are the long-acting anticoagulants of the indanedione class (pindone, diphacinone, diphenadione, and chlorphacinone), which are extremely toxic.

Treatment: Seek immediate veterinary help. If at all possible, bring in the product container so the veterinarian can identify the poison. This is important, because treatment depends on whether the poison was a first- or second-generation anticoagulant. With observed or suspected recent ingestion, induce vomiting (see page 29).

Treatment of spontaneous bleeding caused by all anticoagulants involves your veterinarian administering fresh whole blood or frozen plasma in amounts determined by the rate and volume of blood loss. Vitamin K_1 is a specific antidote. It is given by subcutaneous injection and repeated subcutaneously or

orally as necessary until clotting time returns to normal. With first-generation anticoagulants, this often occurs within a week. With long-acting anticoagulants, treatment takes up to a month because of the length of time the poison remains in the cat's system.

Hypercalcemic Agents

Hypercalcemic agents are poisons that contain vitamin D (cholecalciferol) as their effective agent. Cholecalciferol poisons work by raising the calcium content in blood serum to toxic levels, eventually producing cardiac arrhythmias and death. They are becoming increasingly popular because rodents do not develop resistance to them. Cats who eat poisoned rodents may develop toxicity, but in most cases, the cat must eat the poison itself to become ill.

In cats, signs of hypercalcemia appear 18 to 36 hours after ingesting the poison. The signs include thirst and frequent urination, vomiting, generalized weakness, muscle twitching, seizures, and, finally, death. Among survivors, the effects of an elevated serum calcium may persist for weeks.

Treatment: If you suspect your cat has ingested one of these poisons within the past four hours, induce vomiting (see page 29) and notify your veterinarian. Veterinary treatment involves correcting the fluid and electrolyte imbalances and lowering calcium levels using diuretics, prednisone, oral phosphorus binders, and a low-calcium prescription diet. Calcitonin is a specific antidote, but it is difficult to obtain and has only short-term effects.

Bromethalin

This rodenticide acts on the central nervous system by causing *edema* in the cells of the brain and spinal cord. One of the first signs seen in cats is paralysis, including seizures or inability to urinate. Mild cases may show only *ataxia*.

Treatment: If caught soon after ingestion, induce vomiting (see page 29) and follow up with activated charcoal (page 29). Get the cat to your veterinarian. Steroids given by your veterinarian and gingko supplements may help, at least somewhat. Once symptoms have started it can be dangerous to give any oral treatments. If the cat survives, recovery may take weeks.

POISON BAITS

Animal baits containing strychnine, sodium fluoroacetate, phosphorus, zinc phosphide, and metaldehyde are used in rural areas to control gophers, coyotes, and other predators. They are also used in stables and barns to eliminate rodents. These baits are highly palatable and therefore may be ingested by a cat. Many are extremely toxic and kill in a matter of minutes. Fortunately, they are being used less frequently because of livestock losses, concerns about persistence in the environment, and their potential to poison pets and children.

Strychnine

Strychnine is used as a rat, mouse, and mole poison. It has also been a common coyote bait. Fortunately, the use of strychnine is decreasing. In concentrations greater than 0.5 percent, its use is restricted to certified exterminators. It is available to the public in concentrations of 0.3 percent or less. With better regulation and the use of lower concentrations, strychnine is becoming a less common cause of accidental poisoning.

It is available commercially as coated pellets dyed purple, red, or green. Signs of poisoning are so typical that the diagnosis can be made almost at once. Onset is sudden (less than two hours after ingestion). The first signs are agitation, excitability, and apprehension. They are followed rather quickly by intensely painful muscular seizures that last about 60 seconds, during which the cat throws his head back, can't breathe, and turns blue. The slightest stimulation, such as tapping the cat or clapping your hands, starts a seizure. This characteristic response is used to make the diagnosis. Other signs associated with nervous system involvement include tremors, champing, drooling, uncoordinated muscle spasms, collapse, and paddling the legs.

Seizures due to strychnine and other central nervous system toxins are sometimes misdiagnosed as epilepsy. This error can be a fatal mistake, because immediate veterinary attention is necessary to treat poisoning. Epileptic seizures usually last a few minutes and do not recur during the same episode. Signs always appear in a certain order, and each attack is the same. They are over before the cat can get to a veterinarian. Usually, they are not considered emergencies (see *Seizures*, page 339).

Treatment: If your cat is showing the first signs of poisoning and hasn't vomited, induce vomiting as discussed on page 29. Do not induce vomiting if the cat exhibits signs of labored breathing or has started having seizures.

With signs of central nervous system involvement, do not delay to induce vomiting. It is important to avoid loud noises or unnecessary handling that might trigger a seizure. Cover your cat with a coat or blanket and immediately go to the nearest veterinary clinic. Further treatment involves your veterinarian administering intravenous diazepam (Valium) or barbiturates to control seizures. The cat is then placed in a dark, quiet room and disturbed as little as possible.

Sodium Fluoroacetate

Sodium fluoroacetate (compound 1080/1081), a very potent rat and gopher poison, is mixed with cereal, bran, and other rodent feeds. It is so potent that cats and dogs can be poisoned just by eating a dead rodent. Its use is restricted to licensed pest control operators and it is used infrequently in the United States, but it might be found in old barns.

The onset of signs is sudden and begins with vomiting, followed by agitation, straining to urinate or defecate, a staggering gait, atypical fits or true convulsions, and then collapse. Seizures are not triggered by external stimuli, as are those of strychnine poisoning.

Treatment: Immediately after the cat ingests the poison, induce vomiting (see page 29). Care and handling is the same as for strychnine poisoning (page 34).

Arsenic

Arsenic has been combined with metaldehyde in slug and snail baits and may appear in ant poisons, weed killers, wood preservatives, and insecticides. Its use is on the decline. Arsenic is also a common impurity found in many chemicals. Death can occur quickly after ingestion, before there is time to observe the symptoms. In more protracted cases the signs include thirst, drooling, vomiting, staggering, intense abdominal pain, cramps, diarrhea, paralysis, and death. The breath of the cat will have a strong odor of garlic.

Treatment: Induce vomiting (see page 29). Go to your veterinarian to start intravenous fluid therapy to flush the kidneys. A chelating agent to bind the arsenic, called dimercaprol, may be used, but it has side effects. British anti-Lewisite (BAL) is a specific antidote.

Metaldehyde

This poison, often combined with arsenic, is used commonly in rat, snail, and slug baits. It may also be a component of solid fuel for camp stoves. The signs of toxicity are excitation, drooling and slobbering, uncoordinated gait, muscle tremors, and weakness that leads to inability to stand within a few hours after ingestion. The tremors are not triggered by external stimuli.

Treatment: Immediately after the cat ingests the poison, induce vomiting (see page 29). The care and handling are similar as described for strychnine poisoning (page 34). Death may occur days later from liver failure.

Phosphorus

This chemical is present in rat and roach poisons, fireworks, flares, matches, and matchboxes. A poisoned cat may have a garlic odor to his breath. The first signs of intoxication are vomiting and diarrhea. They may be followed by a symptom-free interval, then by recurrent vomiting, cramps, pain in the abdomen, convulsions, and coma.

Treatment: Induce vomiting (see page 29) when you suspect the cat has ingested a product or poison that contains phosphorus. Do not coat the bowel with milk or egg whites, as this can actually promote absorption. Take your cat to the nearest veterinary facility. There is no specific antidote.

Zinc Phosphide

This substance is found in rat poisons and grain fumigant. Intoxication causes central nervous system depression, labored breathing, vomiting (often with blood), weakness, convulsions, and death. Cats who eat rodents or birds poisoned by zinc phosphide may show signs of toxicity.

Treatment: There is no specific antidote. Treat as you would for strychnine poisoning (see page 34). A stomach *lavage* must be done at a veterinary clinic. The stomach should be lavaged with 5 percent sodium bicarbonate, which raises the gastric pH and delays the formation of gas.

INSECTICIDES

There are dozens of products sold at hardware, home repair, and agricultural stores to kill ants, termites, wasps, garden pests, and other insects. Most of them contain organophosphates and carbamates as their active ingredients. With the development of pyrethrin insecticides that are equally effective but much less toxic, organophosphates and carbamates are being used less frequently.

Organophosphates and Carbamates

The organophosphates include chlorpyrifos, diazinon, phosmet, fenthion cythioate, and tetrachlorvinphos. The two most common carbamates in pet products are carbaryl and propoxur. Most cases of organophosphate or carbamate poisoning occur because the cat ingested a poison bait or was treated with flea products made for dogs. Exposure to high concentrations of chemicals in sprays and dusts is also possible. Organophosphates are especially toxic to cats.

Signs of toxicity include hyperexcitability, excessive salivation and drooling, frequent urination, diarrhea, muscle twitching, weakness, staggering, collapse, and coma. Death is by respiratory failure.

Treatment: If you suspect your cat has ingested an insecticide poison, immediately induce vomiting (see page 29) and notify your veterinarian. With any sign of toxicity, the first priority is to get your cat to the veterinarian as quickly as possible.

The specific antidote your veterinarian will administer for organophosphate poisoning (*not* carbamate poisoning) is 2-PAM (pralidoxime chloride). Atropine is given for both organophosphate and carbamate poisoning to control excessive salivation, vomiting, frequent urination and defecation, and to reverse a slow heart rate. Seizures are controlled with diazepam (Valium) or barbiturates.

In the event of skin exposure, give the cat a bath with soapy water and rinse thoroughly to remove residual insecticide.

Chlorinated Hydrocarbons

These compounds, of which the prototype is DDT, are added to sprays and dusts to control plant pests. Their use has been curtailed because of persistent toxicity in the environment. Only lindane and methoxychlor are currently approved for use around livestock. Chlorinated hydrocarbons are readily inhaled and easily absorbed through the skin. Toxicity can occur from repeated exposure or a single excessive exposure. These compounds are extremely toxic to cats.

Signs of toxicity appear rapidly. The signs include hyperexcitability with twitching of the face, followed by muscle tremors that begin at the head and progress back to involve the neck, shoulder, trunk, and rear legs. Seizures and convulsions are followed by respiratory paralysis and death.

Treatment: There is no specific antidote. The cat should be thoroughly bathed. Treatment at a veterinary hospital includes supporting life functions, removing ingested poison from the stomach by gastric lavage and/or activated charcoal, and controlling seizures.

Pyrethrins and Pyrethroids

These compounds are incorporated into many insecticidal shampoos, sprays, dusts, dips, foggers, and sprays. Pyrethrins and the synthetic pyrethroids are much safer to use on and around dogs (and humans) than are other insecticides, and they are being used more widely. However, *only* the pyrethrins are safe for cats. In addition, many over-the-counter topical flea products have concentrated pyrethrins as their active ingredient. Cats may be affected by that high level of pyrethrins.

The synthetic pyrethroids are *not* safe for use in cats. Common chemicals in this class include permethrin, allethrin, fenvalerate, resmethrin, and sumethrin. Some cats have been poisoned by simply curling up and sleeping with a dog who has one of the topical permethrin products on him or by licking or grooming a dog with those products on his coat.

Signs of toxicity include drooling, depression, muscle tremors, staggering, vomiting, and rapid, labored breathing. Simultaneous exposure to organophosphates increases the toxicity of pyrethroids. Hyperthermia (high body temperature) may be noted.

Treatment: Induce vomiting (see page 29) within two hours of ingestion. Call your veterinarian for further instructions. Do not induce vomiting if the product contains a petroleum distillate. With signs of toxicity, proceed immediately to the veterinary clinic.

For topical exposure, remove residual insecticide by bathing the cat in *lukewarm* water (bathing in hot or cold water may actually increase the rate of absorption or cause hypothermia, which increases toxicity) and Dawn dishwashing soap or feline shampoo to strip out the chemicals. (*Do not* use flea shampoo.) Rinse very thoroughly. After bathing, keep the cat warm.

If signs of hyperthermia are evident, you must attempt to cool the cat down (see *Heat Stroke*, page 24). This is more common with permethrin toxicity.

Methocarbamol may be administered by your veterinarian to control tremors; diazepam is not usually effective. Fluid therapy is recommended to thoroughly flush the kidneys.

Prevention: Most cases of poisoning occur because flea control products are not applied properly. Follow all instructions carefully. *Only use products approved for cats on cats. Never use a product made for dogs on a cat.*

PETROLEUM PRODUCTS

Gasoline, kerosene, turpentine, and similar volatile liquids can cause pneumonia if they are aspirated (enter the lungs) or inhaled. The signs of toxicity include vomiting, difficulty breathing, tremors, convulsions, and coma. Death is by respiratory failure. Ingesting these compounds will cause gastrointestinal upset and may burn the mouth and esophagus, and may cause liver or kidney failure.

Treatment: *Do not induce vomiting.* Flush the mouth thoroughly to remove any traces of residue. Be prepared to administer artificial respiration (see page 11). Activated charcoal may be recommended by your veterinarian, or stomach lavage may be used to remove as much as possible of the ingested products.

These products can be very irritating to the skin, so remove them as quickly as possible. Bathe the cat using warm, soapy water. For tar in the coat, see page 127.

LEAD

Lead is found in insecticides and previously served as a base for many commercial paints. Intoxication occurs mainly in kittens and young cats who chew on substances that have been coated with a lead paint. Other sources of lead are linoleum, fishing weights, batteries, and plumbing materials. Lead poisoning can occur in older cats if they ingest an insecticide containing lead. A chronic form does occur with repeated low-level exposure.

Acute poisoning begins with abdominal pain and vomiting. In the chronic form, a variety of central nervous system signs are possible. They include fits, uncoordinated gait, excitation, attacks of hysteria, weakness, stupor, and blindness. These are also signs of encephalitis (see page 334).

Treatment: Immediately after ingestion, induce vomiting. Seek immediate medical attention. Specific antidotes are available from your veterinarian, who can also do blood tests to determine the lead levels.

CORROSIVE HOUSEHOLD PRODUCTS

Corrosive and caustic chemicals (acids and alkalis) are found in household cleaners, dishwasher detergents, toilet bowl cleaners, drain decloggers, and commercial solvents. When ingested, they cause burns of the mouth, esophagus, and stomach. Severe cases are associated with acute perforation of the esophagus and stomach. Later, strictures of these organs may develop from tissue damage and scarring. Even simply walking through a phenolic disinfectant solution, such as Lysol, can be dangerous for cats, especially if they lick their feet to clean them.

Treatment: *Do not induce vomiting!* Vomiting will simply double the tissue damage. Rinse out your cat's mouth—under a running faucet, if possible, or with a hose. Contact your veterinarian following any exposures to these products.

The practice of giving an acid to neutralize an alkali, and vice versa, is no longer recommended because it causes heat injury to the lining of the stomach.

If these products get on the cat's skin, prevent him from licking or grooming and flush the area thoroughly for at least 10 to 30 minutes with running water.

GARBAGE AND FOOD POISONS

Cats are more particular than dogs about what they eat. Nevertheless, they do sometimes scavenge and come into contact with carrion (rotting flesh or meat), decomposing foods, animal manure, and other noxious substances (some of which are listed in *Diarrhea*, page 228). Cats are more sensitive than dogs to food poisoning and exhibit effects at lower levels of exposure. This is partly due to their smaller size and the lack of the liver enzyme glucuronyl transferase.

Signs of poisoning usually begin with vomiting and pain in the abdomen. In severe cases, they are followed two to six hours later by a diarrhea that is often bloody. Shock may occur—particularly if the problem is complicated by bacterial infection. Mild cases recover in one to two days.

Treatment: *Seek immediate veterinary attention* for signs of dehydration, toxicity, and shock. In mild cases, coat the bowel as described in *How to Induce Vomiting and Prevent Poison Absorption* (page 29).

Dangerous Foods

Along with food poisoning from spoiled foods, cats lack the enzymes to properly digest some foods. Two of these are onions and garlic. Cats can be exposed to onion from the onion powder in some baby foods or by chewing on *Allium* species plants. Garlic may be a component of some natural flea repellant products. Signs are intestinal upset and possibly anemia as toxins build up

that destroy red blood cells. Treatment may include antioxidants, oxygen therapy, and even blood transfusions for severe cases.

Chocolate and coffee can be toxic to cats, due to the stimulants they contain—theobromine and caffeine, respectively. Signs include excitability, weakness, rapid breathing, and even death. Induce vomiting (see page 29). Activated charcoal (see page 29) may also be helpful. The cat may need fluid therapy at a veterinary clinic to flush the system.

Grapes, raisins, and macadamia nuts are all foods that have been found to be toxic in dogs. It can be assumed they are not good for cats, although luckily, cats seem to avoid these products. Xylitol, an artificial sweetener found in sugar-free baked goods and gums, is another food that is toxic to dogs and can be assumed to be toxic in cats.

POISONOUS PLANTS

With some types of vegetation, only certain parts of the plant are toxic. With others, the whole plant is poisonous. Ingestion causes a wide range of symptoms. They include mouth irritation, drooling, vomiting, diarrhea, hallucinations, seizures, coma, and death. Other plant substances cause skin rash. Some toxic plants have specific pharmacological actions, and are used in making medicines. The signs they cause vary widely.

Tables of toxic plants, shrubs, and trees are included on pages 41 to 43 for reference. This list is a collection of common toxic plants. It is not a list of all poisonous plants. If you're not sure about a plant, ask your veterinarian or the local plant nursery. The ASPCA also has a list of poisonous plants on its web site (www.aspca.org). Your local Cooperative Extension is often a good source of information about poisonous plants.

TOAD AND SALAMANDER POISONING

In North America there are two species of poisonous toad (*Bufo*). The Colorado River toad is found in the Southwest and Hawaii. The marine toad is found in Florida. There is one species of poisonous salamander, the California newt, found in California.

All toads, even nontoxic ones, have a bad taste. Cats who mouth them slobber, spit, and drool. The marine toad is highly poisonous, causing death in as little as 15 minutes.

Symptoms in cats depend on the toxicity of the toad or salamander and the amount of poison absorbed. They vary from slobbering to convulsions, blindness, and death.

Treatment: Flush out your cat's mouth (use a garden hose if necessary) and induce vomiting, as described on page 29. Be prepared to administer CPR (see page 12). Take your cat to the veterinarian. Be prepared to describe the toad or salamander in as much detail as you can. Cats with salamander poisoning usually recover quickly.

Indoor Plants with Toxic Effects

Houseplants that cause a skin reaction after contact with the skin or mouth

Chrysanthemum	Poinsettia
Creeping fig	Weeping fig

Irritating plants, some of which contain oxalic acid, which causes mouth swelling, difficulty swallowing, respiratory problems, and gastrointestinal upsets

Arrowhead vine	Marble queen
Boston ivy	Mother-in-law plant
Caladium	Neththyis
Calla or arum lily	Parlor ivy
Dumbcane (dieffenbachia)	Pothos or devil's lily
Elephant's ear	Peace lily
Emerald duke	Red princess
Heart leaf (philodendron)	Saddle leaf (philodendron)
Jack-in-the-pulpit	Split leaf (philodendron)
Majesty	Tuberous begonia
Malanga	

Plants that contain a wide variety of poisons—most cause vomiting, an acutely painful abdomen, and cramps; some cause tremors, heart and respiratory problems, and/or kidney problems, which are difficult for owners to interpret

Amaryllis	Jerusalem cherry
Asparagus fern	Nightshade
Azalea	Pot mum
Bird-of-paradise	Ripple ivy
Creeping Charlie	Spider mum
Crown of thorns	Sprengeri fern
Elephant's ear	Umbrella plant
Ivy species	

continued

Outdoor Plants with Toxic Effects

Outdoor plants that can cause vomiting and diarrhea

Bittersweet woody	Indian tobacco
Castor bean	Indian turnip
Crocus	Larkspur woody
Daffodil	Poke weed
Delphinium	Skunk cabbage
Foxglove	Soapberry
Ground cherry	Tulip
Hyacinth	Wisteria

Trees and shrubs that may cause vomiting, painful abdomen, and diarrhea

American yew	Horse chestnut
Apricot	Japanese plum
Almond	Mock orange
Azalea (rhododendron)	Monkey pod
Balsam pear	Peach
Bird-of-paradise bush	Privet
Buckeye	Rain tree
Cherry	Western black locust yew
English holly	Wild cherry
English yew	

Outdoor plants with varied toxic effects

Angel's trumpet	Mescal bean
Buttercup	Moonseed
Day lily	Mushrooms
Dologeton	Nightshades
Dutchman's breeches	Pigweed
Jasmine	Poison hemlock
Jimsonweed	Rhubarb
Locoweed	Spinach
Lupine	Sunburned potatoes

Outdoor Plants with Toxic Effects	
May apple	Tomato vine
Matrimony vine	Water hemlock
Tiger lily	
Hallucinogens	
Locoweed	Periwinkle
Marijuana	Peyote
Morning glory	Poppies
Nutmeg	
Outdoor plants that cause convulsions	
Chinaberry	Nux vomica
Coriaria	Water hemlock
Moonweed	

Insect Stings, Spiders, and Scorpions

Because cats are predators and are curious by nature, they tend to be at risk from small poisonous creatures. The stings of bees, wasps, yellow jackets, and ants cause painful swelling at the site of the sting. Cats tend to get stung about the face and on the paws. Swelling may include the face and neck, or be localized to the area of the sting. If a cat is stung many times, he could go into shock as the result of absorbed toxins. Rarely, a hypersensitivity reaction (anaphylactic shock) can occur if the cat was exposed in the past (see page 13).

The stings of black widow and brown recluse spiders and tarantulas are toxic to animals. The first sign is sharp pain at the sting site. Later, the cat may develop excitability, chills, fever, and labored breathing. Shock and seizures may occur, with early paralysis from black widow bites. Most cats will die. There is antivenin if it can be obtained from your veterinarian in time. Brown recluse spider bites cause two syndromes. One is a cutaneous form with a localized blister and pain. Eventually, a bull's-eye lesion may be noted. Over a week or two, the involved skin will die and ulcerate, leaving a wound that may take months to heal. The second, visceral form is accompanied by fever, painful joints, and possibly vomiting and seizures. Cats may develop blood disorders and kidney failure. This form is much rarer and is often fatal.

Tarantula bites are usually not serious, but the barbed hairs they drop can be irritating to skin and mucous membranes.

The stings of centipedes and scorpions cause a local reaction and, at times, severe illness. These bites heal slowly. Poisonous scorpions are found only in southern Arizona (two species). A young kitten or small cat is at greater risk due to his small size.

TREATING STINGS AND BITES

1. Identify the insect or animal, if possible.
2. Remove an embedded stinger with tweezers, or scrape it out with a credit card. (Only bees leave their stingers behind.)
3. Make a paste of baking soda and apply it directly to the sting.
4. Apply ice packs to relieve swelling and pain.
5. Apply Calamine lotion and Cortaid to relieve itching if needed, but cover the area with a loose bandage so the cat will not lick off the medication.

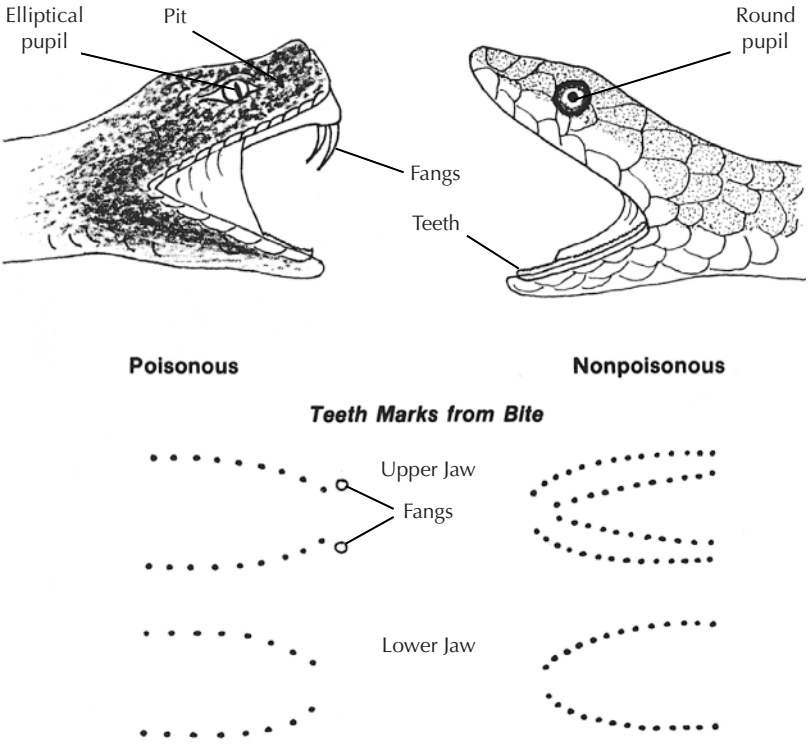
If the cat exhibits signs of generalized toxicity or anaphylaxis (restlessness, agitation, face scratching, drooling, vomiting, diarrhea, difficulty breathing, collapse, or seizures), transport him immediately to the nearest veterinary facility. If your cat is known to have reactions to bee stings, ask your veterinarian about keeping an EpiPen kit available and what dose to use for your cat. The EpiPen kits are special prepackaged kits of injectable epinephrine for counteracting anaphylactic shock. Epinephrine has a short expiration date, so check frequently to be sure your kit is not outdated.

Snake and Lizard Bites

Poisonous and nonpoisonous snakes are widely distributed throughout North America. Cats may come into contact with snakes while hunting or out of curiosity. In general, bites of nonpoisonous snakes do not cause swelling or pain. They show teeth marks in the shape of a horseshoe (no fang marks).

Ninety percent of snake bites in cats involve the head and legs. Body bites from poisonous snakes usually are lethal.

In the United States there are four poisonous varieties: cottonmouths (also called water moccasins), rattlesnakes, copperheads, and coral snakes. The diagnosis of poison snake bite is made by the appearance of the bite, the behavior of the animal bitten, and identification of the species of snake. (Kill it first, if possible.)



Except for the coral snake, all poisonous species in North America are pit vipers. Note the elliptical pupil, the pit below the eye, the large fangs, and the characteristic bite.

PIT VIPERS (RATTLESNAKES, COTTONMOUTHS, AND COPPERHEADS)

You can identify these species by their large size (4 to 8 feet, 1.2 to 2.4 m long), triangular heads, pits below and between the eyes, elliptical pupils, rough scales, and the presence of retractable fangs in the upper jaw.

The bite: You may see one or two bleeding puncture wounds in the skin; these are fang marks. You may have to search the haircoat and skin carefully at first to find the punctures. Signs of local reaction appear quickly and include sudden severe swelling, redness, and hemorrhages in the skin. The pain is immediate and severe.

Note that 25 percent of poisonous snake bites lack venom and thus do not produce a local reaction. While absence of local swelling and pain is a good sign, it does not guarantee the cat won't become sick. Severe venom poisoning has been known to occur without a local reaction.

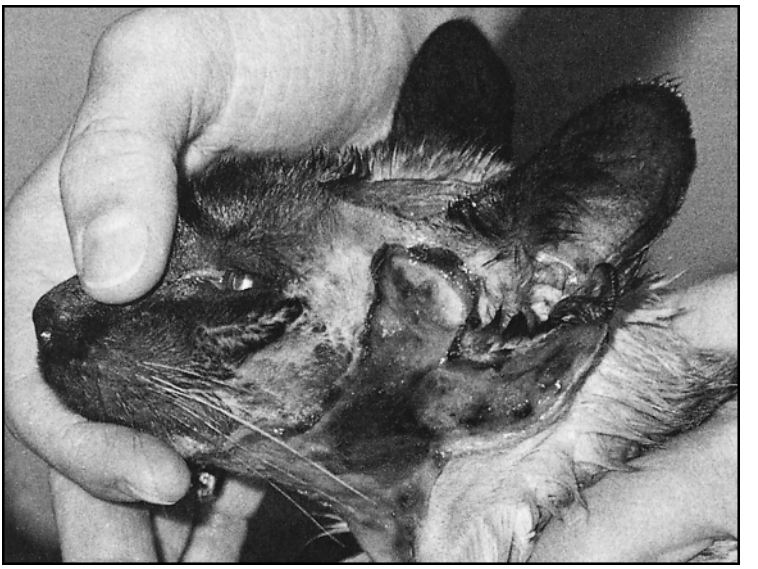
The cat's behavior: Signs of envenomation may take several hours to appear because of variables such as time of the year, species of the snake, toxicity of the venom, amount injected, location of the bite, and size and health of the cat. The amount of venom injected bears no relationship to the size of the snake. The first signs are extreme restlessness, panting, drooling, and weakness. These are followed by diarrhea, depressed breathing, collapse, sometimes seizures, shock, and death in severe cases.

CORAL SNAKES

Identify this snake by its rather small size (less than 3 feet, .9 m long), small head with black nose, and brightly colored alternating bands (red, yellow and black) fully encircling the body. The fangs in the upper jaw are not retractable.

The bite: There is less severe redness and swelling at the site of the bite, but the pain may range from mild to excruciating, depending on whether venom was injected. Look for the fang marks.

The cat's behavior: Coral snake venom is a neurotoxin, meaning it affects the nerves and causes weakness and paralysis. Signs include vomiting, diarrhea, urinary incontinence, paralysis, convulsions, and coma. Some cats will survive.



This cat with a poisonous snake bite shows an extensive face wound after loss of devitalized tissue.

LIZARDS

Two species of poisonous lizard are found in the United States, both in southwestern states. They are the Gila monster and the Mexican bearded lizard. The bite of these lizards could potentially be fatal to a cat. If the lizard has a firm hold on the cat, pry open the lizard's jaws with pliers and remove the cat from the lizard.

TREATING SNAKE AND LIZARD BITES

First identify the snake or lizard and look at the bite. If the animal is not poisonous, clean and dress the wound as described in the section on *Wounds* (below). If it appears the cat has been bitten by a poisonous snake or lizard and if you are within 30 minutes of a veterinary hospital, *proceed at once to the veterinary hospital*. If you are unable to get help within 30 minutes, follow these steps, then go to the nearest veterinarian.

- *Keep the cat quiet*. Venom spreads rapidly if the cat is active. Excitement, exercise, and struggling increase the rate of absorption. Carry the cat.
- If the bite is on the leg, apply a constricting bandage (a handkerchief or a strip of cloth) between the bite and the cat's heart. You should be able to get a finger beneath the bandage; loosen the bandage for five minutes every hour.
- Do not wash the wound, because this will increase venom absorption.
- Do not apply ice, because this does not slow absorption and can damage tissue.
- Do not make cuts over the wound and/or attempt to suck out the venom. This is never successful and you could absorb venom.

Proceed to the veterinary hospital. Veterinary treatment involves respiratory and circulatory support, antihistamines, intravenous fluids, and species-specific antivenin. The earlier the antivenin is given, the better the results. Because signs of envenomation are often delayed, all cats who have been bitten by a poisonous snake or lizard—even those who don't show signs—should be hospitalized and observed for 24 hours.

Wounds

The two most important goals in treating wounds are to stop the bleeding and to prevent infection. Wounds are painful, so be prepared to restrain the cat before treating the wound (see *Handling and Restraint*, page 2).

CONTROLLING BLEEDING

Bleeding may be arterial (bright red blood will spurt out) or venous (dark red blood will ooze out), or sometimes both. Do not wipe a wound that has stopped bleeding, as this will dislodge the clot. Similarly, don't pour hydrogen peroxide on a fresh wound. Peroxide dissolves clots and starts a fresh round of bleeding. It may also damage the tissues and delay healing.

The two methods used to control bleeding in an emergency situation are a pressure dressing and a tourniquet.

Pressure Dressing

The most effective and safest method for controlling bleeding is to apply pressure directly to the wound. Take several sterile gauze squares (or, in an emergency, use any clean cloth such as a thickly folded pad of clothing) and place it over the wound. Apply direct pressure for 5 to 10 minutes. Leave the dressing in place and bandage snugly. If material for bandaging is not available, hold the pack in place until help arrives.

Watch for signs of swelling of the limb below the pressure pack (see *Foot and Leg Bandages*, page 52). This indicates impaired circulation. If you see these signs, the bandage must be loosened or removed. Consider adding more bulk to the pack and apply a second bandage over the first. Transport the cat to a veterinary hospital.

Tourniquet

Tourniquets can be used on the extremities and tail to control arterial bleeding that can't be controlled with a pressure pack. *Tourniquets should never be used if bleeding can be controlled by direct pressure.* Always place the tourniquet *above* the wound (between the wound and the heart).

A suitable tourniquet can be made from a piece of cloth, belt, or length of gauze. Loop the tourniquet around the limb, then tighten it by hand or with a stick inserted beneath the loop. Twist the loop until the bleeding stops.

If you see the end of the artery, you might attempt to pick it up with a pair of tweezers and tie it off with a piece of cotton thread. When possible, this should be left to a trained practitioner.

A tourniquet should be loosened every 10 minutes to prevent tissue hypoxia and to check for persistent bleeding. If bleeding has stopped, apply a pressure bandage as described in the previous section. If bleeding continues, let the blood flow for 30 seconds and then retighten the tourniquet for another 10 minutes.

PUNCTURE WOUNDS

Puncture wounds are caused by bites and pointed objects. Animal bites, in particular, are heavily contaminated with bacteria. There may be bleeding. There may also be bruising, particularly if the cat was picked up in the teeth of a bigger animal and shaken. Puncture wounds are often concealed by the cat's coat and may easily be overlooked until an abscess develops a few days later.

Treating a puncture wound requires a veterinarian. It involves surgically enlarging the skin opening to provide drainage, after which the area is irrigated with a dilute antiseptic surgical solution. These wounds should not be closed. With all animal bites, keep in mind the possibility of rabies. If your cat is bitten by an animal of unknown vaccination status or a wild animal, a rabies booster may be recommended.

Bites from other cats very often lead to abscesses. Antibiotics are frequently prescribed for bite wounds and wounds that are heavily contaminated, such as puncture wounds.

TREATING WOUNDS

Nearly all animal wounds are contaminated with dirt and bacteria. Proper care and handling will reduce the risk of tetanus and prevent many infections. Before handling a wound, make sure your hands and instruments are clean.

An infected wound near the base of the tail from a cat fight. Because of the bacteria in cats' mouths, bites from other cats often lead to infection and abscess.

The five steps in wound care are as follows:

1. Skin preparation
2. Wound irrigation
3. Debridement
4. Wound closure
5. Bandaging

Skin Preparation

Remove the original pressure dressing and cleanse the area around the wound with a surgical scrub solution. The most commonly used solutions are Betadine (povidone-iodine) and Nolvasan (chlorhexidine diacetate). Both products are extremely irritating to exposed tissue in the concentrations provided in the stock solutions (Betadine 10 percent, chlorhexidine 2 percent), so be very careful that the solution does not get in the wound while scrubbing the skin around it. Dilute the solution to a weak tea color for Betadine or a pale blue color for Nolvasan.

After the scrub, start at the edges of the wound and clip the cat's coat back far enough to prevent any long hairs from getting into the wound.

Three-percent hydrogen peroxide, often recommended as a wound cleanser, has little value as an antiseptic and is extremely toxic to tissues. Do not use it on a wound, as it can damage tissues and delay healing.

Wound Irrigation

The purpose of irrigation is to remove dirt and bacteria. The gentlest and most effective method of wound cleansing is by *lavage*, which involves irrigating the wound with large amounts of fluid until the tissues are clean and glistening. Do not vigorously cleanse the wound using a brush or gauze pad because this causes bleeding and traumatizes the exposed tissue.

Tap water is an acceptable and convenient irrigating solution. Tap water has a negligible bacterial count and is known to cause less tissue reaction than sterile or distilled water.

If possible, add chlorhexidine solution or Betadine solution to the tap water for antibacterial activity. Chlorhexidine has the greater residual antiseptic effect, but either antiseptic solution (not soap solutions) is satisfactory when correctly diluted. To dilute chlorhexidine, add 25 ml of the 2 percent stock solution to 2 quarts (2 l) of water, making a 0.05 percent irrigating solution. To dilute Betadine, add 10 ml of the 10 percent stock solution to 2 quarts (2 l) of water to make a 0.2 percent irrigating solution.

The effectiveness of the irrigation is related to the volume and pressure of the fluid used. A bulb syringe is a low-pressure system. It is least effective and

requires more fluid to achieve satisfactory irrigation. A large plastic syringe removes a moderate amount of dirt and bacteria. A home Waterpik unit (used by people to clean their teeth) or a commercial lavage unit that provides a high-pressure stream of fluid is the most effective.

A garden hose with a pressure nozzle for the initial lavage, or a kitchen sink spray unit, followed by one of the methods just described to deliver the antiseptic, is a good alternative. You want to flush and clean the wound, not force dirt deeper into the tissues. Angle your flow of liquid to accomplish that and let the fluid pool to bring debris to the surface.

Debridement

Debridement means removing dying tissue and any remaining foreign matter using tissue forceps (tweezers) and scissors or a scalpel. Debridement requires experience to determine the difference between normal and devitalized tissue, and instruments to control bleeding and close the wound. Accordingly, wounds that require debridement and closure should be treated by a veterinarian.

Wound Closure

Fresh lacerations on the lips, face, eyelids, and ears are best sutured or stapled to prevent infection, minimize scarring, and speed recovery. Lacerations longer than half an inch (1.25 cm) on the body and extremities probably should be closed, but small lacerations may not need to be. The exception is small V-shaped lacerations, which almost always heal best if sutured.

Wounds contaminated by dirt and debris are quite likely to become infected if they are closed at the time of injury. These wounds should be left open or sutured around a drain that can be used for through and through irrigation. Similarly, wounds older than 12 hours should not be closed without drainage. Suturing or stapling should be avoided if the wound appears to be infected (is red, swollen, or has a surface discharge).

Your veterinarian may decide to close a wound that has been left open for several days and has developed a bed of clean tissue. Wounds that are clean after several days are resistant to infection and usually can be closed without negative consequences. Suturing such a wound is called delayed primary closure.

The length of time sutures or staples should remain in place depends on the wound's location and other characteristics. Most sutures and staples can be removed after 10 to 14 days.

Bandaging

Bandaging protects the wound from dirt and contaminants. It also restricts movement, compresses skin flaps, eliminates pockets of serum, keeps the edges of the wound from pulling apart, and prevents the cat from biting and licking at the wound. Bandaging is most effective for wounds to the extremities. Dressings

over draining or infected wounds must be changed once or twice a day. The bandage should be bulky enough to absorb the drainage without soaking through.

Bandages are more difficult to apply to cats than to dogs and, once applied, are more difficult to keep in place. Cats who do not tolerate bandages and continually remove them may be helped by mild sedation. As an alternative, an Elizabethan collar or a BiteNot collar may be helpful. Wounds about the head and those draining pus are best left open to help drainage and ease of treatment.

When a cat claws and macerates a wound or continually scratches at a skin condition, treatment can be facilitated by bandaging his back feet or securing baby socks over the paws, and clipping his nails.

Bandaging is made much easier when a cat is gently but firmly restrained, as discussed on page 2. The bandaging equipment you will need is listed in the *Home Emergency and Medical Kit* (page 1).

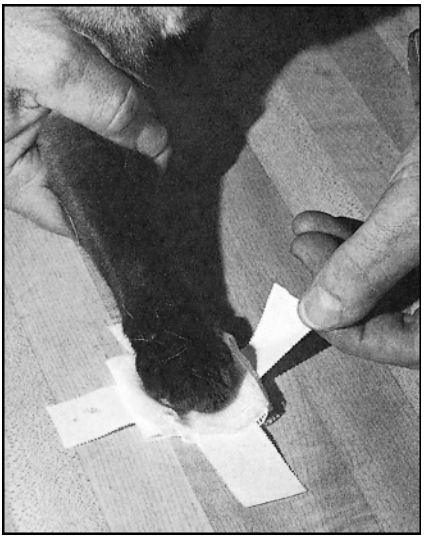
Foot and Leg Bandages

To bandage a foot, place several sterile gauze pads over the wound. Pull apart a cotton ball and insert small bits between the cat's toes. Hold in place with adhesive tape looped around the bottom of the foot and back across the top until the foot is snugly wrapped.

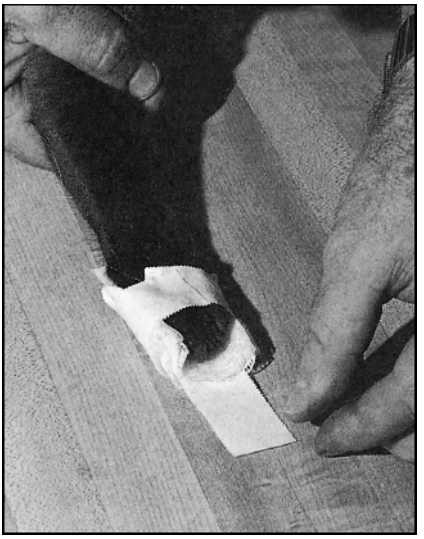
For leg wounds, begin by wrapping the foot as just described. Then cover the wound with several sterile gauze pads and hold in place with strips of adhesive tape. On top, pad the entire leg with plenty of cotton so the dressing won't become too tight and interfere with circulation. Wrap the leg first with roll gauze, firmly but not too tightly, then wrap the leg with elastic tape or bandage, as shown in the photographs on page 53. Your veterinarian or a veterinary technician can show you the best way to bandage an individual wound.

Veterinary wraps, such as VetWrap, work well, but you need practice to have the right amount of tension so you don't cut off circulation. Flex the knee and foot several times to be sure the bandage is not too tight and that there is good movement at the joints.

Wrap the tape around the leg at the top, but do not overlap it because you want the tape to stick to the cat's hair. This technique keeps the dressing from sliding up and down, which often happens when only a roll gauze bandage is used without tape at the top. When a dressing is to be left in place for some time, check every few hours to be sure the foot is not swelling. Over the next few hours, check the toes for coolness and observe the feet for swelling. Swelling of the leg below a bandage will be seen in the toes. When the toes are swollen, the nails are spread apart instead of being side by side. If this swelling is not treated by removing the bandage, the foot becomes cold and loses feeling. If there is any question about the sensation or circulation to the



To apply a foot bandage, start by covering the injured area with several layers of gauze.



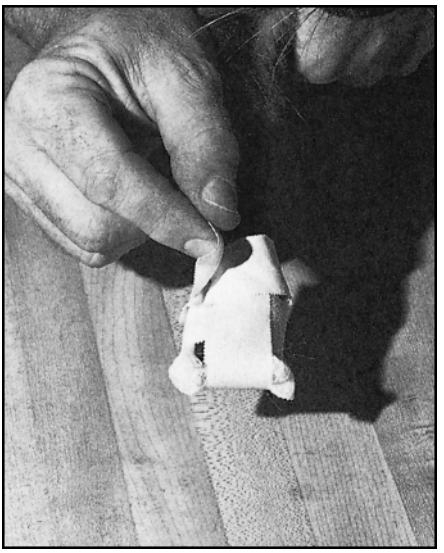
Hold the gauze in place with adhesive tape looped around the bottom of the foot and back across the top.

foot, loosen the dressing. Cats will frequently attempt to lick, bite or remove dressings that are too tight and uncomfortable.

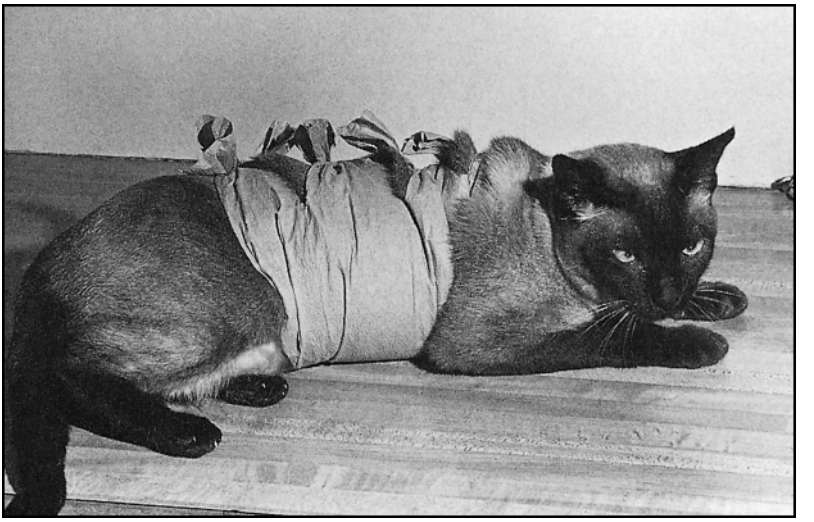
You may need to put a plastic baggie over the wound bandage when the cat goes to the litter box, to prevent litter from getting up inside the bandage. A cat with a bandage should not be allowed outside.

Bandages over clean, healing wounds can be changed every two days, but should be inspected three or four times a day for signs of constriction, limb swelling, slippage, drainage, or soiling. If there are signs of any of these problems, replace the bandage.

Wounds on the foot or leg may be covered with a splint as well as a bandage. The splint minimizes movement of the area and speeds healing.



Tape loosely to allow for good circulation.



A many-tailed bandage may be used to keep kittens from nursing if the mother's breasts are infected.

Many-Tailed Bandage

This bandage is used to protect the skin of the abdomen, flanks, or back from scratching and biting and to hold dressings in place. It is made by taking a rectangular piece of linen and cutting the sides to make tails. Tie the tails together over the back to hold the bandage in place.

Ear Bandage

These dressings are difficult to apply. Most ear injuries can be left open. To protect the ears from scratching, use an Elizabethan or a BiteNot collar.

Eye Bandage

Your veterinarian may prescribe an eye bandage as part of the treatment of an eye ailment. Place a sterile gauze square over the affected eye and hold it in place by taping around the head with 1-inch-wide (25-mm) adhesive. Be careful not to wind the tape too tight. Apply the dressing so that the ears are free.

You may need to change the dressing from time to time to apply medication to the eye. Many cats will need to wear an Elizabethan or a BiteNot collar to prevent them from removing the bandage.

To make an eye bandage, wrap a gauze roll around the eye. A pad may be placed beneath the gauze. Secure with tape. The ears should be free.

HOME WOUND CARE

Small, open wounds can be treated at home without sutures or staples. Medicate the area twice a day with a topical antibiotic ointment such as triple antibiotic. The wound can be left open or covered with a dressing. Make sure the cat is not licking or chewing at the wound. You may need to use a wound covering such as a sock, or put an Elizabethan or a BiteNot collar on the cat.

Infected wounds that are draining pus require the application of moist sterile compresses. A number of topical antiseptics are effective in treating superficial wound infections. They include chlorhexidine, Betadine (diluted as described in *Wound Irrigation*, page 50), Furacin (both the topical cream and the 0.2 percent solution), 1 percent Silvadene cream, and topical antibiotics containing bacitracin, neomycin, and polymyxin B (triple antibiotic). Apply the topical antibiotic directly to the wound or place it on a gauze pad and dab the wound.

Change the dressing once or twice a day to facilitate pus drainage. Again, try to keep the cat from licking or grooming off the medication. Distracting the cat with play or food may give the medication time to be absorbed.