

wildfire disasters highlight the importance of burn injury care in companion animals

Treating burn injuries in animals consists of managing the systemic effects of the burn injury, ensuring adequate nutrition and fluid intake, dressing the wounds, debriding dead tissue, and managing pain.

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By Julie A. Jacob



Stabilizing the animal is a critical first step to handling burn injuries before transporting the patient to a facility for long-term care. Photo courtesy Dr. Jeffrey Smith

Although burn injuries do not rank among the most common veterinarians encounter in their practices, they may see more of them in coming years. are occurring more frequently, and summers are becoming hotter, increasing the risk of dogs burning their paws on hot asphalt and cement.

In addition to wildfires, burn injuries can be caused by house fires, outdoor fires, caustic chemicals, scalding water, electrical injuries, hot radiators, s of radiation treatment, and other situations where animals come into contact with fire or extreme heat. No matter the cause, just as with human pat treating burn injuries in animals consists of managing the systemic effects of the burn injury, ensuring adequate nutrition and fluid intake, dressing t wounds, debriding dead tissue, and managing pain.

"We first evaluate the cardiovascular, respiratory, and neurological systems to see if they have life-threatening changes, and once more stable, we de the size and depth of the injury," says Deborah Mandell, VMD, professor of emergency and critical care medicine at the University of Pennsylvania (U School of Veterinary Medicine.

The first few hours are critical, Dr. Mandell says, because skin retains heat for four hours and the burn injury can continue to worsen during that tim. Ensuring adequate fluid therapy is also crucial to maintain adequate tissue perfusion during the first 12-24 hours due to the release of cytokine and inflammatory mediators.

"It can take days for the extent of the injury to become apparent, and during that time the cardiovascular, respiratory, and metabolic derangements

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are about the size of a credit card. The number of cards needed to cover the wound is multiplied by 0.45 and divided by the animal's weight in meters:

"The rule of thumb is if it's greater than 20 percent of their total body surface area, there will be serious life-threatening cardiovascular and metabolic derangement," Mandell says.

Once the animal is stabilized, focus turns to dressings, daily bandage changes, debridement, infection control, and pain management, she adds.

Silver sulfadiazine (SSD) is often used as a dressing to prevent infection and promote healing, but other dressings, such as aloe vera, medicinal honey, nanocrystalline silver or cerium nitrate with SSD are also used.

Jeff Smith, DVM, regional coordinator for the California Veterinary Medical Reserve Corps (CVMRC), which treats animals injured in wildfires and other disasters, says CVMRC veterinarians have used silver-infused bandages as an alternate to SSD, with good results.

"This change is much more supportive of the healing tissue while still being a very effective anti-infective," says Dr. Smith.

After the wildfire that destroyed Lahaina, HI, in August 2023, the Maui Humane Society treated dozens of cats that had burn injuries to their ears, feet, eyes, along with a dog, a rabbit, and guinea pigs. For dressings, the staff used SSD, SSD with insulin, and honey, says Laurie Gaines, DVM, MHS, Maui Society medical director.



Silver sulfadiazine (SSD) is a common dressing for infection prevention and healing. Silver-infused bandages can also be used. Photo courtesy Dr. Jeffrey Smith

Multimodal approach to management

Pain management is crucial and a multimodal approach targeting different pain receptors works better than using just one drug.

Burned cats injured in California wildfires are usually given a combination of an opioid, such as buprenorphine, gabapentin, and an NSAID, such as n

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Multiple approaches to debridement

Several different techniques can be used to debride burn wounds, including autolytic, enzymatic, mechanical, or surgical approaches. Ultrasonic and pressure water debridement are newer methods, but they are more expensive, Mandell says.

Maggots are another method of wound debridement. The treatment was used successfully at Lloyd Veterinary Medical Center at Iowa State University to debride wounds on a bully breed dog that had incurred second- and third-degree burns on 50 percent of its body after burning gasoline splashed on it.

The primary care veterinarian had treated the dog for a few days and stabilized it before it was brought to Lloyd, where the veterinary team decided to use medical-grade maggots to debride her wounds.

While maggots have been used for decades to debride wounds in human burn injury patients, they have not been used as much in veterinary practice due to cost and time constraints, says April Blong, DVM, associate professor of veterinary clinical sciences at Iowa State, who was one of the authors of the paper documenting the case.

"Maggots have special enzymes to break down dead tissue and they don't consume living, viable tissue. We applied the maggots and that helped quite a bit with the debridement process," says Dr. Blong. Approximately 1,500 maggots were placed over the wound and covered with a semipermeable dressing and bandages. The dog showed some discomfort during the process, requiring an increase in pain medication, but overall did well. "She was very patient," says Blong.

The dog has burn wounds 20 cm to 30 cm across, which was too large for new skin cells to grow across the entire wound, so the team used an acellular skin graft to cover the wound and facilitate new skin growth. Almost two years after the dog was injured, new skin had completely grown over its wounds.



One of the early mistakes was going through this very formalized protocol, which is not practical in the field. You often have to manage the patient seeing with a different sort of triage philosophy than if they were coming into your own veterinary clinic and get them moved on to a proper hospital Smith.



LawLaw, the last burned cat released from the Maui Humane Society after five months of hospitalization. LawLaw was adopted by a veterinary assistant. Photo courtesy Maui Humane Society

Gaines says her team learned the importance of reaching out for guidance from veterinarians who have experience treating burn injuries. Through weeks and months the Maui Humane Society staff were caring for rescued animals with burn injuries, they were in close contact with veterinary surgeons on Oahu, as well as veterinarians on the mainland who have treated animals injured in wildfires.

Finally, veterinarians who have treated animals with burn injuries say there is much to be learned and replicated from care provided to human burn patients. "Maybe we don't see as many burn patients as in humans, but the way human burn patients are treated is leaps and bounds ahead of animals and a lot we can learn and borrow from them," Blong says.

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