Distemper of Dogs

BY C. D. STEIN

ONE of the most common and frequently fatal diseases of young dogs, distemper still causes many deaths every year, though it can now be largely prevented by vaccination.

Canine distemper is an acute, highly contagious, febrile disease caused by a filtrable virus and affecting principally young dogs. The disease is characterized by a catarrhal inflammation of all the mucous membranes of the body, which is frequently accompanied by nervous symptoms and pustular eruptions of the skin. It has its human counterpart in the form of influenza, which, though not identical with distemper, is very similar in many respects.

This insidious disease, which has been referred to by some writers as the "scourge of dogdom," is one of the most common and fatal diseases affecting dogs and has probably been the subject of more discussion and investigation than any other canine malady.

It will be readily appreciated from the foregoing that distemper is a very serious and complicated disease, requiring expert attention; hence, when a dog is suspected of having it, a veterinarian should be consulted immediately. However, persons who have some knowledge of the general characteristics and methods of prevention and control of the disease are in a position to reduce to a minimum the danger that their dogs will acquire it and to safeguard affected dogs, at least to some extent, from its ravages and after effects. The purpose of this discussion is to furnish such information rather than to outline a thorough course of treatment for distemper.

Distemper is known in all countries where there are dogs and occurs in all parts of the United States at all seasons of the year, but it appears to be more prevalent during the winter and the cold damp weather of early spring and late autumn. While young dogs of all breeds are susceptible, it appears to be more common in highly bred animals than in mongrels. Puppies with weak constitutions, and pampered, overfed, underexercised pet dogs kept in overheated

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quarters appear to contract the infection more readily and suffer more from the disease than hardy animals properly fed and living in a natural environment.

While distemper is, as stated, primarily a disease of young dogs, affecting principally animals between the ages of 2 months and 1 year, typical cases are occasionally observed in mature dogs. The disease rarely occurs in unweaned pups, since some degree of protection is passed on to a nursing litter through the milk of the bitch.

According to Kirk distemper is most prevalent during the process of dentition, occurring most commonly in puppies 6 weeks to 9 months old, but cases have been observed in pups as young as 10 to 14 days old and in rare instances in very old dogs.

Few species of animals other than dogs are susceptible to the disease. Cats, rabbits, guinea pigs, rats, and human beings are not susceptible. The ferret is extremely susceptible and is used as a laboratory animal by research workers in studying the disease. Reports indicate that distemper may occur in minks, weasels, foxes, wolves, wild dogs, lynxes, and raccoons in captivity.

Devitalizing influences which decrease the resistance of puppies, such as rickets, parasitic infestation, insanitary, poorly ventilated kennels, lack of exercise, and an unbalanced diet, are factors predisposing to distemper.

**CAUSE AND TRANSMISSION**

The primary causative agent was first demonstrated to be a filterable virus by Carré in 1905. Laidlaw and Dunkin, during their classical researches on this disease in 1926 to 1928, proved conclusively that the primary causative factor in simple, uncomplicated distemper was a filterable virus. This finding has since been confirmed by a number of investigators in this country.

From a clinical standpoint, however, the disease may be divided into a primary filterable virus stage and a secondary stage complicated by invasion of bacterial organisms. Two distinct factors, therefore, play a part in canine distemper: (1) The specific filterable virus, which produces the early symptoms, and (2) the bacterial organisms, such as Alcaligenes bronchisepticus and others referred to as secondary invaders, which produce serious complicating conditions usually associated with the disease. In this respect, distemper in dogs is analogous to influenza in horses, swine, and human beings, in which a specific virus plays the primary and bacterial organisms a secondary role.

The virus is readily destroyed by heat and by most of the common disinfectants in a few hours, but it resists drying and low temperatures for several days. At temperatures below freezing it can survive for months.

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1 KIRK, HAMILTON. CANINE DISTEMPER, ITS COMPLICATIONS, SEQUELÆ, AND TREATMENT. 226 pp., illus. London. 1922.
Although it is often impossible to ascertain the source of infection in outbreaks of distemper in individual dogs or kennels, it is known that the infection may spread from affected to susceptible animals either by direct or indirect contact. Where large numbers of dogs are assembled, as in dog pounds, shows, pet shops, or boarding kennels, the infection is apt to exist and be spread to susceptible dogs. According to Laidlaw and Dunkin, distemper is highly infectious in the early stages, even before clinical symptoms are noticeable. They further reported that the virus was uniformly found in the nasal secretion and blood early in the disease but not always late in the attack. There was also evidence that infection might be carried short distances in the air in confined places.

Pyle regards droplet infection as the principal factor in natural transmission. In transmission experiments with ferrets he was unable to demonstrate that the infection was air-borne. In further experiments with dogs he obtained evidence to indicate that animals that had recovered from distemper or those immunized with live virus were not virus carriers.

**SYMPTOMS AND DIAGNOSIS**

The period of incubation in distemper (that is, the length of time between exposure to infection and the appearance of the first symptoms), is very variable. Laidlaw and Dunkin reported that under experimental conditions the incubation period tends to be constant at 4 days, with a minimum of 3 days and a maximum of 6. Pyle regards 4 or 5 days as the average period of incubation. Regenos considers the incubation period from natural exposure to range from 4 to 10 days or longer, with an average of about a week. He further reports that the average course of the disease, whether it ends in recovery or death, is 29 days, while seriously complicated cases may run a course of 4 to 12 weeks. Dailey, in reporting on observations made on more than 3,600 cases in 1 year, states that in natural exposure the incubation period is about 7 days and that the disease runs a course of about 4 weeks, barring complications.

The symptoms in an established case of distemper depend to a large extent on the form the disease takes and are therefore very variable.

The early symptoms, as a rule, are of so mild a nature that they are recognized by careful observers only. These first symptoms may be a rise in the body temperature and watery discharges from the eyes and nose. The appetite may be somewhat impaired, and the general disposition becomes more or less sluggish. In about a week's time the symptoms become well marked, a discharge of mucus and pus from eyes and nose appears, and complications of a more or less serious nature, such as broncho-pneumonia, hemorrhagic inflammation of the gastrointestinal tract, and disturbances of the brain and

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spinal cord, frequently set in. During the early stages of the disease, the body temperature may suddenly rise from the normal 101° F. to 103° or 105°. Shivering, dryness of the nostrils and a slight dry cough, increased thirst, a drowsy expression of the eyes, and a desire to sleep may be observed. Later diarrhea, pneumonia, convulsions, paralysis, or chorea (a nervous disorder) may develop. An inflammation of the membranes of the eyes may sometimes occur, which in turn may permanently damage the eyesight through ulceration or opacity of the cornea. Extreme weakness and a great loss of body weight occur in the advanced stages.

The changes in the body tissues resulting from canine distemper, like the clinical symptoms, are variable. In acute uncomplicated cases, enlargement of the spleen and abdominal lymph glands and the presence of a few scattered pin-point hemorrhages may constitute the only lesions, or tissue alterations. Subacute and chronic cases usually cause marked alterations in the respiratory and gastrointestinal tracts due to bacterial infection with secondary invaders. Hemorrhagic areas, congestion, edema (watery swelling), or pneumonia may be observed in the lungs, whereas a catarrhal or hemorrhagic enteritis, or intestinal inflammation, and exudates in the abdominal cavity may also be found.

On account of its obscure nature and great similarity to other catarrhal affections of bacterial origin, the diagnosis of distemper is sometimes difficult, especially in the early stages. In young dogs with a history of exposure to the disease, however, an elevation of body temperature, together with shivering, sneezing, partial loss of appetite, a slight eye and nasal discharge, sluggishness, and diarrhea, is very suggestive of distemper.

TREATMENT AND PREVENTION

Good nursing and proper care are important in promoting the recovery of sick dogs. Like similar febrile diseases due to filtrable viruses, distemper runs a definite course regardless of any medicinal treatment that may be administered. Therefore, nostrums advanced as so-called quick cures for distemper have no value.

The treatment of distemper is largely concerned with alleviating the symptoms and is usually attended with considerable difficulty. No drug or combination of drugs is known at this time that has a specific action in this disease. Homologous anti-canine-distemper serum, a biological product prepared from the blood of immune dogs that have been hyperimmunized against the disease, is of value in lessening the severity of an attack if administered subcutaneously or intravenously (under the skin or into the veins) during the early stages of the disease. Dogs affected with distemper should be provided with clean, warm, dry, well-ventilated quarters and should be given only small quantities of such easily digested, nourishing foods as milk, raw eggs, raw beef, and beef broth. Affected animals should be kept quiet and can be kept clean by daily grooming with brush and comb. The eyes and nose should be kept free from accumulated discharges. The eyes may be bathed with a weak boric acid solution.
to allay irritation, and petrolatum may be applied to the edges of the nostrils to prevent cracking and irritation of the skin. Under no circumstances should an affected animal be permitted to get wet or chilled, nor should drugs be administered unless prescribed by a veterinarian. When the animal begins to show signs of improvement it must not be given an undue quantity of food at one meal, since overeating may cause a relapse or even death. The convalescing dog should be allowed to exercise only very moderately.

Diseases of the nervous system frequently occur during or after an attack of distemper. Chorea, a disease characterized by a persistent twitching of certain muscles or groups of muscles, is one of the most common of these affections. No specific treatment can be recommended to cure chorea. There is a tendency for the twitching to become progressively worse and terminate in paralysis of one or more groups of muscles. A nutritious diet of fresh meat, milk, and eggs, regular evacuation of the bowels and bladder, and clean, warm, dry, and comfortable surroundings free from annoyance may assist in the recovery of mild cases. The treatment of the after effects of distemper, like that of the disease itself, should be under the supervision of a qualified veterinarian.

Much progress has been made in recent years in immunization against canine distemper, but in spite of the great advances made in the control of the disease, it still takes a heavy annual death toll among unvaccinated dogs and causes considerable financial losses to owners and breeders.

There are two recognized standard methods of distemper prophylaxis, or prevention: (1) The vaccine-virus, or Laidlaw-Dunkin method, which consists in the administration of vaccine followed by living virus, and (2) the serum-virus method, which consists in the administration of anti-canine-distemper serum and living virus. The different methods of vaccination now in use in this country are all modifications of one or the other of these basic forms of immunization. The Department of Agriculture has conducted no tests to determine the relative merits of the different methods of immunization, but reports from the field indicate that, when properly applied, any one is an effective means of controlling the disease.

It is generally believed that puppies should not be immunized against distemper until they are at least 3 months old. Some investigators who have done considerable research on this problem are of the opinion that when puppies under 4 to 6 months of age are vaccinated, complete immunity is not produced. When danger of infection is imminent, however, puppies 6 to 8 weeks old may be protected by the administration of vaccine or anti-canine-distemper serum and revaccinated at 4 to 6 months of age by one of the standard methods of immunization, which should include the administration of living virus. The dog to be vaccinated should be free from parasites and rickets and in a state of general good health.

The vaccination of dogs against distemper should be undertaken only by a qualified veterinarian, as proper immunization involves not only an understanding of the principles of immunity but the consideration of a number of other factors.
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In the control of distemper it is important that affected animals be promptly isolated, as close contact between infected and susceptible dogs during an outbreak results in a rapid passage of the disease to the latter.

Inasmuch as distemper is caused by a specific contagion that is known to remain alive and active outside the animal body, it is essential that after an outbreak the premises be thoroughly disinfected before susceptible animals are brought in. For this purpose, a 5-percent solution of phenol, a 2-percent formaldehyde solution, a 2-percent lye solution, or a 3-percent compound solution of cresol, U.S.P. (see the article on Disinfection and Disinfectants, p. 179) may be used.

To eradicate completely the contagion of distemper from the premises, it is essential that all objects that have come in contact with affected dogs, as well as the quarters occupied by them, be thoroughly cleaned and disinfected. All litter or old bedding should be burned. The infective agent is destroyed in a short time when exposed to direct sunlight. It would be advisable to allow several weeks to elapse even after a thorough cleansing and disinfection of the premises before bringing in a new puppy, unless the puppy has previously been immunized against distemper.

At the time this book went to press, the drugs and other materials mentioned in various articles—chiefly as disinfectants, insecticides, and anthelmintics—were still available for veterinary and medical use. Under war conditions, however, it is possible that some of these materials may become scarce or unavailable. In that case, the reader should obtain professional advice from the Department of Agriculture, the State experiment station, a local veterinarian, or the county agent as to available substitutes.