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## Morbidity and Mortality Weekly Report (MMWR)

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### Rabies in a Dog Imported from Iraq -- New Jersey, June 2008

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**Please note:** An erratum has been published for this article. To view the erratum, please click [here](#).

Rabies vaccination and stray dog control have led to successful control of canine rabies in the United States. The number of rabid dogs reported decreased from approximately 5,000 in 1950 to 79 in 2006, when the canine rabies virus variant associated with dog-to-dog rabies transmission was declared eliminated in the United States (1). On June 18, 2008, a mixed-breed dog, recently shipped from Iraq into the United States, was confirmed to have rabies by the Public Health and Environmental Laboratories of the New Jersey Department of Health and Senior Services. A total of 24 additional animals in the shipment, all potentially exposed to the rabid dog, were distributed to 16 states. This report summarizes the epidemiologic investigation by the New Jersey Department of Health and Senior Services, Bergen County Department of Health, and CDC, and the ensuing public health response. These findings underscore the need for vigilance regarding rabies (and other zoonotic diseases) during animal importation to prevent the possible reintroduction and sustained transmission of canine rabies in U.S. dog populations.

#### Case Report

On June 5, 2008, a shipment of 24 dogs and two cats arrived in the United States from Iraq as part of an international animal rescue operation. The goal of the operation was to reunite servicemen returning to the United States with animals they had adopted in Iraq. Upon arrival at Newark Liberty International Airport, the animals received physical examinations from volunteer licensed veterinarians. One cat became ill with neurologic signs during transport and was euthanized on arrival. The cat was tested for rabies and was negative. The remaining 24 dogs and one cat were housed for several days at the airport before distribution to their final U.S. destinations.

On June 8, one of the 24 dogs, a mixed-breed aged 11 months (dog A), became ill and was taken to a veterinarian the next day. The dog was hospitalized with fever, diarrhea, wobbly gait, agitation, and crying. The dog's condition deteriorated, progressing to lateral recumbency with periods of agitation. On June 11, the dog was euthanized. Specimens were shipped to the Public Health and Environmental Laboratories for rabies testing, but delivery of the specimens was delayed. On June 18, the specimens were tested, and rabies was diagnosed. Specimens also were submitted to CDC, where rabies was confirmed on June 26 and typed as a rabies virus variant associated with dogs in the Middle East.

#### Public Health Investigation

The potentially infectious period for a dog, cat, or ferret with rabies can begin as many as 10 days before the onset of clinical signs and continue throughout the clinical course until death (2). To identify potential rabies exposure to humans or other animals while dog A was in Iraq, during transport, or at the airport shelter, an investigation was initiated by the New Jersey Department of Health and Senior Services and the Bergen County Department of Health, with participation from CDC. The dog was reportedly in the possession of a U.S. soldier in Baghdad for approximately 7 months before shipment to the United States. The dog had been kept in an indoor-outdoor run on a military base and had not been vaccinated for rabies; the owner reported no signs of illness in the dog or potential exposure to other rabid animals during the 7 months. The owner also reported no potential exposures to other persons or animals during the 2 days of potential infectivity before the dog was transferred to the animal rescue operation for shipment on May 31.

Upon arrival in the United States, none of the 24 dogs were accompanied by the valid rabies vaccination certificates required for admission by CDC animal importation regulations.\* For dogs aged ≥3 months, a rabies vaccination must be administered at least 30 days before the date of arrival at a U.S. port. Five of the 24 dogs (not including dog A) reportedly had received a previous rabies vaccination; however, none of the information required for a valid rabies vaccination certificate was available, including vaccine manufacturer, lot numbers, or a certifying veterinarian signature. Twenty-one of the animals in the shipment, including dog A, had received a primary rabies vaccination in Iraq during May 28 -- 31, immediately before being shipped to New Jersey. Because none of the dogs met rabies vaccination requirements for importation, in accordance with the importation regulation, a confinement agreement was issued by CDC, stating where the animals would be held for at least 30 days after vaccination. During shipment and upon arrival in New Jersey, all the animals were housed in separate crates; however, interviews with persons present during the animals' arrival and stay in Newark identified potential periods during which dogs, including dog A, were allowed to intermingle.

On June 10, 1 day before dog A was euthanized and 8 days before rabies was diagnosed, the remaining 23 dogs and one cat were shipped to destinations in 16 states.† Because none of the surviving animals had a verifiable history of vaccination at least 30 days before their potential exposure to dog A, CDC recommended immediate vaccination and a 6-month quarantine for all of them (2). State health departments in the 16 states were advised of the recommendations.

During the public health investigation, 28 persons were evaluated for potential rabies exposure; 13 were identified with potential exposure because of direct contact with possibly infectious saliva (3) and were recommended to initiate rabies postexposure prophylaxis (PEP). All 23 dogs and one cat were located by state and local health authorities within 2 weeks of the rabies diagnosis. No clinical signs consistent with rabies were reported in the animals during 20 days of follow-up. All 24 animals continue to be monitored during the 6-month quarantine period.

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#### Editorial Note:

Rabies virus infection results in a fatal encephalomyelitis in humans and other mammals. Globally, the most common sources of human rabies are geographically distinct rabies virus variants maintained predominantly through dog-to-dog transmission (i.e., canine rabies), but sometimes with spillover§ into other species. In the United States, occasional spillover into dogs of rabies virus variants associated with wildlife has occurred. However, since 2004, no rabies case attributable to an indigenously acquired canine rabies virus variant has been reported (1).

Canine rabies virus variants most commonly are imported via unvaccinated dogs from areas where rabies is enzootic, such as Asia, Africa, the Middle East, and parts of Latin America, where canine variants are responsible for most of the 55,000 human rabies deaths estimated worldwide each year (4). In May 2004, an unvaccinated puppy was flown from Puerto Rico to Massachusetts as part of an animal rescue program. The day after arrival, the puppy exhibited neurologic signs, was euthanized, and was subsequently confirmed to have rabies. Six persons were recommended to receive PEP because of potential exposure. In June 2004, an unvaccinated puppy adopted by a U.S. resident in Thailand was confirmed to have rabies by the California Department of Public Health. Of 40 persons interviewed for potential rabies exposure, 12 received PEP. In March 2007, a puppy adopted by a U.S. veterinarian while volunteering in India was confirmed to have rabies by the Alaska Department of Health and Social Services. The puppy was flown in cargo to Seattle, Washington, then adopted by another veterinarian in Juneau, Alaska, where it was flown 7 days after arrival. Of 20 persons interviewed for potential rabies exposure, eight received PEP (5,6). In all three cases, the rabies virus variant was typed as a variant circulating in dogs and terrestrial wildlife in the animal's country of origin (i.e., mongoose and canine rabies virus variants enzootic in Puerto Rico, Thailand, and India, respectively).

This report reiterates the need for education of the public regarding rabies incidence in other countries and preventing rabies exposure. While traveling in areas that are endemic for rabies, travelers should not pet stray animals. In addition, travelers should not adopt stray animals without acquiring a veterinarian's health assessment and ensuring proper animal vaccination for importation. Travelers also should consider their potential for rabies exposure from animals, understand proper wound management, and promptly report animal bites to health-care providers (7). Health information for travelers is available at <http://wwwn.cdc.gov/travel/contentyellowbook.aspx>.

CDC administers federal importation regulations for dogs. These regulations allow admittance of unvaccinated dogs aged <3 months, provided the importer signs an agreement to vaccinate the dog at age 3 months and confine the animal for 30 days after the vaccination. Dogs aged ≥3 months that have not been vaccinated for rabies also must be confined until vaccinated and for 3 months after vaccination. Upon arrival in the United States, importers should declare animals to federal authorities and comply with those requirements for confinement of unvaccinated puppies.

CDC's regulations were created in the early 1950s to guide persons importing dogs or cats as their personal pets. However, recent trends in dog importations have shown an increase in the numbers of animals being imported for commercial pet trade (8). CDC is working to update current regulations and better address the importation of dogs. In July 2007, the U.S. Department of Health and Human Services posted an advance notice of proposed rulemaking to begin the process of revising CDC's animal importation regulations, including those that apply to dogs and other companion animals.¶

U.S. animal importation regulations, rabies vaccination requirements for dogs, wildlife rabies surveillance and vaccination programs, and prophylaxis for human exposures all contribute to public health protection from rabies. Continued vigilance and partnership between federal and state agencies, as well as health professionals and pet importers, are vital to decrease the risk for reemergence of canine rabies virus in the United States.

\* 42 CFR § 71.51.

† California, Colorado, Connecticut, Iowa, Kentucky, Maryland, Massachusetts, Missouri, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Virginia, and Washington.

§ Transmission of a rabies virus variant to a secondary host from a primary reservoir species, usually resulting in a dead-end infection, such as human rabies acquired from a rabid dog.

¶ Available at <http://www.cdc.gov/ncidod/dq/anprm/index.htm>.

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