

NEUROLOGIC EXAMINATION AND DIAGNOSTIC TESTING IN RABBITS, FERRETS, AND RODENTS

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Abstract

Rabbits, rodents, and ferrets are accepted as patients in many veterinary practices, with their owners being dedicated to providing excellent health care for their pets. It is of the utmost importance to provide these animals the same level of care offered to more common companion mammal species (e.g., dogs and cats). Veterinarians must be knowledgeable of anatomical and physiological parameters associated with the companion exotic mammal species to appropriately treat these animals when presented for illness or to have a surgical procedure performed. This eventually results in improved medical care and ultimately a longer and healthier life. Neurologic and musculoskeletal diseases commonly affect rabbits. However, neurologic signs are rarely reported in ferrets and rodents and often appear to be a manifestation of systemic illness rather than a primary neurologic disease. The primary aim of a neurologic examination is to determine whether a neurologic problem exists and, if so, to determine its anatomical location. When considered together with the patient's history and findings of physical examination, neuroanatomical localization allows the formulation of a list of possible differential diagnoses, which then further determines the diagnostic tests that can be performed to reach a definitive disease diagnosis. Copyright 2014 Elsevier Inc. All rights reserved.

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Neurologic disease is commonly diagnosed in rabbit patients. However, in ferrets and rodents, fewer patients are presented exhibiting neurologic clinical signs and may often be a manifestation of systemic illness rather than a primary neurologic disease. Performing a detailed neurologic examination on these companion exotic mammal species can be challenging owing to their small size, difficulties in handling, and the effects of stress on accurately interpreting certain neurologic tests. The general neurologic examination consists of a series of observations of spontaneous or induced sensory and motor functions of the animal. The primary objective of the veterinary examiner is to determine whether the presenting problem is neurologic and then, if so, to anatomically localize the lesion in a longitudinal and transverse plane. Localization of a lesion causing neurologic signs will allow the formulation of a list of differential diagnoses, provide the basis for informed decisions to prioritize diagnostic tests to expeditiously reach a definitive disease diagnosis, and enable the establishment of a prognosis.

The neuroanatomy of rabbits, rodents, and ferrets is similar to that of other mammals. Therefore, one can approach the neurologic examination on companion exotic mammals in a similar manner to that described in dogs and cats. However, rabbits and rodents are prey species and are highly effective at masking overt signs of clinical illness. Rabbits

and rodents can be very nervous during a neurologic examination and may not move, making interpretation of neurologic findings very difficult for some patients. It is important to correctly handle all small exotic mammals to avoid further trauma and unnecessary stress. Sedatives or tranquilizers should never be administered to the

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patient before a neurologic examination is performed, as the effects of these therapeutic agents may confound results.

The causes of neurologic disorders may be of traumatic, inflammatory, infectious, neoplastic, nutritional, metabolic, toxic, degenerative, idiopathic, iatrogenic, or congenital origin. Neurologic diseases can be species specific or affect multiple species; they can be associated with a multisystemic disorder or pathology may be limited to the nervous system.¹ A thorough clinical history should always be obtained in any neurologic case and it should include details about diet, husbandry, behavior, home environment, previous and current medical problems, and medications administered. A complete physical examination (including otoscopic and ophthalmoscopic examination), as the clinical status of the animal allows, should also be performed.² Occasionally, evaluation in stages may be required to minimize stress to the animal. A complete blood count and serum biochemistry panel, urinalysis, serology/polymerase chain reaction testing, and heavy metal analysis may be useful to evaluate the patient's general health status and to rule out or identify systemic or infectious diseases that may be responsible for the presenting clinical signs. Further diagnostic investigations may include radiography, ultrasonography, endoscopy, cerebral spinal fluid (CSF) collection and analysis, computed tomography (CT), and magnetic resonance imaging for specific more complicated cases.

EQUIPMENT

Equipment required to perform a basic neurologic examination is listed later and shown in Figure 1.

- Taylor's percussion reflex hammer (Prestige Medical Limited, East House, Duttons Way, Shadsworth Business Park, Blackburn, BB1 2QR, UK)
- Halstead Mosquito Forceps 12 cm Curved (VETisco, Business Incubator Office 25, Myregormie Place, Mitchelston Industrial Estate, Kirkcaldy, Fife, KY1 3NA Scotland)
- Cotton buds
- Pen torch
- Needles

EXAMINATION

Rabbit

Neurologic signs, including head tilt, circling, ataxia, paresis or paralysis, nystagmus, and seizures



FIGURE 1. Equipment used for neurologic examination of small mammals includes a percussion reflex hammer, a Halstead mosquito forceps, cotton buds, and a pen torch.

are frequently diagnosed in rabbit patients.³ It is suggested that the neurologic examination in a rabbit should follow a specific order to minimize stress and reduce handling (Table 1).⁴ Examination procedures that are relatively painless should be performed at the beginning, followed by those that either require intimate handling or are likely to cause discomfort or pain to the animal.

The Rabbit Neurologic Examination: A Step-by-Step Procedure Guide

- (1) *General observation of mental status.* Allow the rabbit to move freely around the consultation room and, while taking the history, observe its attitude, alertness, and responsiveness to the surrounding environment and external

TABLE 1. Recommended order of neurologic examination in rabbits (modified with permission from Vernau et al.⁴)

| |
|--|
| General observation (mental status, posture, and gait) |
| Palpation |
| Postural reactions |
| Spinal reflexes |
| Cranial nerves |
| Sensation |

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