

APPENDIX 5

PHYSICAL EXAMINATION: CAMELID



BASICS

OVERVIEW

- Physical examination should be performed in a methodic and thorough manner.
- Proper physical restraint in the form of a chute or halter is important.
- Because camelids are covered with fiber, a thorough hands-on examination should always be performed.

INCIDENCE/PREVALENCE

- N/A

GEOGRAPHIC DISTRIBUTION

- Worldwide

SYSTEMS AFFECTED

- All systems

PATHOPHYSIOLOGY

- Pathological processes produce specific or nonspecific changes in the physical examination parameters.
- Changes in BCS (particularly weight loss) is a reflection of poor nutrition, poor absorption of nutrition due to gastrointestinal disorders. Other disorder such as genetic defects, overall poor health may result in ill thrift an loss of condition
- The general demeanor of the animal is often affected by chronic diseases
- Rectal temperature outside of the norm may reflect a acute inflammatory/infectious process (fever) or a severe depression of the animals health (hypothermia) or exposure to the elements (hypothermia in debilitated animals and high temperature in case of heat stress)
- The pulse and respiratory rates are often increased in stressful or painful situation
- Deviations from normal auscultation characteristic of the heart, lungs and gastrointestinal system warrant detailed examination of each

HISTORICAL FINDINGS

- A detailed history should be obtained including present and past problems, routine health, nutritional and environmental management, and exposure to other animals.
- History should be obtained at an individual and herd level.

SIGNALMENT

- New world camelids. Reproductive examination differs with sex of the animal.
- Age-specific reference ranges should be considered for interpretation of findings.

PHYSICAL EXAMINATION FINDINGS

Behavioral observation

- Camelids are normally bright, alert and responsive to stimuli and their surrounding environment.
- In general, camelids show reluctance to being approached and examined, especially by strangers or in a strange environment.
- In the face of stress or fear, camelids may adopt sternal recumbency or “cush”.
- Muscle strength, gait, posture and proprioception are evaluated while the animal is being led or is spontaneously moving in the pasture to identify lameness and neurologic deficits.

Body condition scoring

- Palpation and observation of the midback (T8 to L2), fiberless area of the chest behind the elbows, dorsal pelvis, brisket and perineal region allows estimation of body condition score.
- A scale from 1 (thin) to 9 (obese) is used. Ideal body condition score is 5.

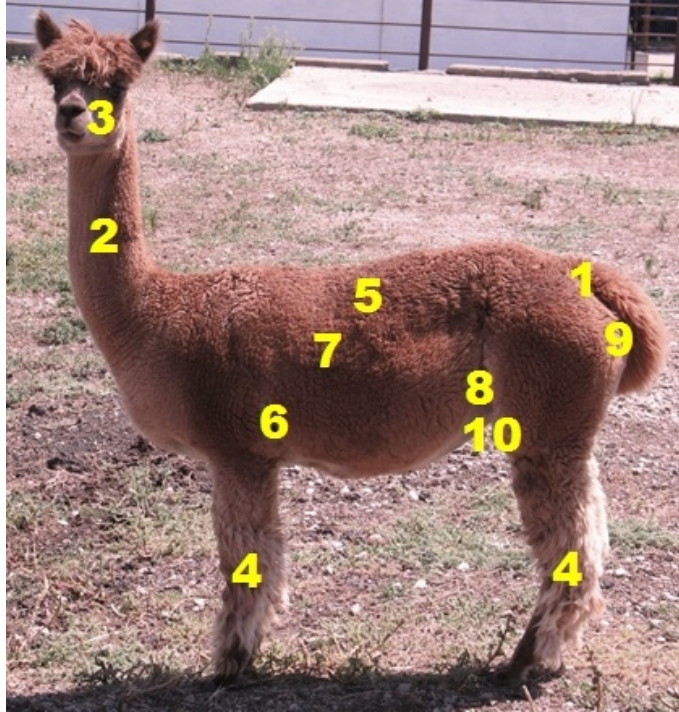
Conformation of the animal

- Conformation should be evaluated from a distance looking at the animal from the front, rear and both side
- Common conformation problems in camelids include various angular limb deformities and dropped pasterns

Physical examination

- Physical examination is performed in a methodic manner (Figure 1)

Figure 1 *Physical examination*



1: Rectal temperature

- Resting rectal temperature is 99.5 to 102 °F (37.5 to 38.9 °C).

Peripheral pulse

- Pulse is best evaluated in the medial saphenous artery.
- Reference range is 60 to 90 beats/minute

2: Respiratory rate and character

- Respiratory rate is best evaluated by observation of nostril flaring or auscultation of the trachea in the lower neck. Reference range is 10 to 30 breaths/minute.
- There is normally a combined thoracic and abdominal effort. However, excessive abdominal effort should be considered a sign of respiratory distress, as is increased nostril flaring and open-mouthed breathing.

3: Examination of the head

- Oral mucosa and conjunctiva are normally pink and moist. Capillary refill time is less than 2 seconds.
- The facial skin and ears are normally free of hyperkeratosis, crusting, erythema or dermatitis. Attention should also be paid to the mucocutaneous junctions.
- Alignment of the jaw is examined by inspection. Maxillary jaw distortion known as wry face is thought to have a genetic origin.
- On oral inspection, the lower incisors should be in contact with the anterior margin of the dental pad. Superior and inferior brachygnathism with an under or overshoot of more than 3 mm, respectively, leads to uneven wear of teeth and the need for dental care treatment.

- The mouth is inspected for missing or broken teeth. Palpation and inspection of the jaws and retropharyngeal space may help identify bony masses, abscesses or enlarged salivary glands or lymph nodes.
- Nares have clear moistness and uniform bilateral air flow. Presence of dryness, mucous, purulent or bloody discharge, as well as alterations in air flow are abnormal.
- External evaluation of ears may reveal lacerations, frostbite injury and alopecia. Animals with ear problems may show head tilt, ear droop or neurologic signs.
- Otoscopic examination is difficult due to the anatomy of camelid ears. Abnormal findings include foreign bodies and ticks. Observation of the tympanic membrane is not always possible.
- Eyelids are usually pigmented and are inspected for abnormalities, like entropion or ectropion. Tearing may be associated with blocked tear ducts.
- The cornea is inspected for presence of opacity, scarring or ulcers. Vision can be determined by observing obstacle avoidance on the lead, menace response and the animal's ability to track moving objects.
- Direct and consensus pupillary light reflexes are normally sluggish. Eye position is evaluated in a neutral position and a few abnormal positions of the head.
- Facial sensation and motor function are evaluated by probing the face, assessing the palpebral reflex and observing the position and symmetry of lips, nostrils and ears.
- Food can be offered to evaluate mastication and deglutition.
- The neck should be palpated and passively flexed to evaluate mobility, pain and palpable abnormalities.

4: Examination of the limbs

- The nails are non-weight bearing and wear with exercise on rough surfaces. Excessively long or curled toenails can lead to permanent alteration in growth or damage to tendons and ligaments, and require trimming.
- The interdigital skin is inspected for signs of mange or dermatitis.
- Foot pads are normally free of cracks, ulcers or lesions.

5: Examination of the skin and fiber

- In general, there is a coverage with long, dense fiber over the back and flanks, dorsum of the tail, neck and proximolateral limbs. Alpacas also have long fleece over the crown of the head.
- Fiber needs to be parted for evaluation of skin in fleece-covered areas of the body. Presence of scaling, crustiness and ectoparasites should be noted.
- Fiber normally does not come out with pulling. Matted fiber that comes out in clumps is abnormal.
- Lumpy lesions on the back and neck may be due to abscesses (*C. pseudotuberculosis*) or furunculosis

6: Examination of the heart

- Cardiac auscultation can be done in the short fleeced axillary area. On the left side, the pulmonic valve can be best heard over the third intercostal space under the triceps brachii. The aortic valve is found more dorsally at the fourth intercostal space, and the mitral valve more ventrally at the chondrocostal junction at the fourth or fifth intercostal space. On the right, the tricuspid valve is best heard over the fourth intercostal space caudal to the triceps brachii.

- The valve areas are palpated for presence of thrill.
- Normal heart rate is 60 to 90 bpm in adults and 90 to 120 bpm in neonates.
- First and second heart sounds are normally heard, as well as physiologic murmurs. Loud third and fourth sounds or systolic murmurs are abnormal.

7: Examination of the lungs

- The lung field is delimited by the caudal border of the triceps muscle, a line extending 20 to 25 cm caudally, and triangling back to the olecranon. Fiber must be parted to allow proper auscultation of the entire lung field.

8: Examination of the abdomen

- Gastric motility can be auscultated in the fiberless area in front of the left stifle. Normal motility is 3 to 5 movements/minute.
- Intestinal borborygmus can be evaluated in the fiberless area in front of the right stifle.
- Abdominal contour is inspected for signs of distension or ventral edema.
- Normal feces are well-formed pellets. Loose stools may be temporarily present in the face of anxiety, change in diet or green pastures, but persistently loose or watery stools are abnormal.

9: Examination of the reproductive tract

- The non-pendulous scrotum is located in the perineal area (No. 9). Inspection may reveal skin lesions, lacerations, dermatitis, enlargement or asymmetry. Heat or pain are abnormal.
- Two testicles are present within the scrotum. Testicles are ovoid in shape, symmetric, painless, freely movable within the scrotum, and resilient and painless on palpation.
- The epididymis is palpated. The head is normally bigger than the tail in camelids.
- The tip of the prepuce is directed caudally in nonaroused camelids. The skin and prepuce orifice should be free of lesions.
- A sigmoid flexure is present cranial to the scrotum. The penis and sigmoid flexure can be palpated transcutaneously for presence of masses or abnormalities. Exteriorization of the penis by manual manipulation requires general anesthesia or heavy sedation.
- In the female, the vulva is observed for conformation, size, lesions, lacerations, swelling or discharge. Vulvar discharge may be seen during the first week post-partum but it is otherwise considered abnormal in Camelids.
- Digital vaginal examination and vaginoscopic examination is performed using aseptic technique to identify vaginal or cervical lacerations, inflammation or adhesions.

10: Examination of the mammary glands

- The mammary gland possesses four teats. Camelids are reluctant to palpation of the mammary glands, but they should be non-painful, symmetric and free of lesions.

GENETICS

- N/A

CAUSES AND RISK FACTORS

- N/A



DIAGNOSIS

DIFFERENTIAL DIAGNOSIS

- N/A

CBC/BIOCHEMISTRY/URINALYSIS

- N/A

OTHER LABORATORY TESTS

- N/A

IMAGING

- N/A

DIAGNOSTIC PROCEDURES

- Additional diagnostic tests and imaging may be indicated depending on the findings of the physical examination.

PATHOLOGIC FINDINGS

- N/A



TREATMENT

THERAPEUTIC APPROACH

- N/A

SURGICAL CONSIDERATIONS AND TECHNIQUES

- N/A



MEDICATIONS

DRUG(S) OF CHOICE

- Chemical restraint may be necessary to complete the physical examination.
- Butorphanol 0.1 mg/kg IV or IM
- Xylazine 0.1 to 0.2 mg/kg IV or IM

CONTRAINDICATIONS

- Appropriate milk and meat withdrawal times must be followed

PRECAUTIONS

- Use of chemical restraint will affect evaluation of cardiovascular status and other physical parameters.

POSSIBLE INTERACTIONS

- N/A



FOLLOW-UP

EXPECTED COURSE AND PROGNOSIS

- N/A

POSSIBLE COMPLICATIONS

- N/A

CLIENT EDUCATION

- Clients should be instructed to conduct BCS periodically
- Client should be observant of any changes in demeanor or behavior which often are the first warning signs of sickness

PATIENT MONITORING

- N/A

PREVENTION /AVOIDANCE

- N/A



MISCELLANEOUS

ASSOCIATED CONDITIONS

- N/A

AGE-RELATED FACTORS

- Age-specific reference ranges should be used for interpretation of findings.

ZOONOTIC POTENTIAL

- N/A

PREGNANCY/FERTILITY/BREEDING

- N/A

RUMINANT SPECIES AFFECTED

- New world camelids.

BIOSECURITY

- N/A

PRODUCTION MANAGEMENT

- N/A

SYNONYMS

- N/A

ABBREVIATIONS

- N/A

SEE ALSO

- Body Condition Score: Alpaca and Llamas (www.fiveminutevet.com/ruminant)
- Breeding Soundness Examination: Camelids
- Camelid: Dentistry
- Camelid: Dermatology
- Camelid: Gastrointestinal Disease
- Camelid: Heat Stress
- Camelid Parasitology
- Camelid: Reproduction
- Congenital Defect: Camelid
- Down Camelid
- Lameness: Camelid
- Mastitis: Camelids
- Neonatology: Camelid
- Nutrition and Metabolic Diseases: Camelid (www.fiveminutevet.com/ruminant)

- Parasitic Skin Disease Camelid
- Respiratory Disease: Camelid
- Weight Loss: Camelid

Suggested Reading

Bedenice, D. 2009. Approach to the critically ill camelid. *Vet Clin Food Amin* 25:407-421.

Johnson, L. W. 2014. Physical examination and conformation. In: *Llama and alpaca care. Medicine, surgery, reproduction, nutrition, and herd health*, ed. C. Cebra, D.E. Anderson, A. Tibary, R.J. Van Saun and L.W. Johnson. 1st ed, St. Louis: Elsevier.

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