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How to Evaluate the Horse with an Upper Respiratory Noise

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Take Home Message

History, physical examination, laryngeal ultrasound and upper airway endoscopy are all important aspects of determining the cause of an abnormal upper respiratory noise. However, additional diagnostics such as a dynamic examination of the upper airway may be required to elucidate the problem(s) causing the abnormal respiratory noise.

A complete and thorough history is a very important part of the upper airway evaluation. It is best to obtain this information from the individual(s) that know the horse best. Most often this is the trainer or rider and may not be the owner of the horse. Specific questions regarding respiratory noise, exercise intolerance, coughing, nasal discharge, previous surgery, and current or previous treatments should be asked. Information regarding whether the noise is made during inspiration or expiration is very helpful but oftentimes it is not accurate because the owner/trainer/rider has not listened for that specifically. Try to determine if the abnormal noise occurs every time the horse works or if it is intermittent. In addition, ask questions to determine at what point during exercise the horse makes the noise. Another very important piece of information, especially in horses that show “collected” or with poll flexion is- Does the head position of the horse have an effect on the respiratory noise? It can be helpful to have the individual describe and characterize any abnormal respiratory noise(s) that the horse makes.

Begin the physical examination with auscultation of both sides of the thoracic cavity. The heart rate, rhythm, and the presence of a murmur are determined. A re-breathing examination is important to evaluate the lungs. Remember that disease(s) of the lower airways and lungs do not cause upper respiratory noise. Visual assessment of the head and nares should be performed to evaluate for asymmetry. Evaluate both nostrils for the presence of airflow and determine if it is equal. Evaluation of head and both eyes for the presence of any cranial nerve deficits should be performed. Each jugular vein should be evaluated for patency. Palpation of common surgical sites should be performed to check for scars. Palpation of a laryngoplasty scar can be difficult but clipping of the hair just ventral to the linguofacial vein can help determine if a scar is present. Palpation of the trachea should be performed to assess if the horse has had previous trauma, malformed tracheal rings, or a tracheotomy. Palpation of the larynx to assess for symmetry should also be performed. This skill is not easy and requires practice in order to become proficient. Abnormalities such as a prominent muscular process (as felt in cases of laryngeal hemiplegia) or the lack of a cricothyroid articulation (as felt in cases of laryngeal dysplasia) are important physical examination findings.

Endoscopy of the upper airway is then performed. The resting endoscopic examination is very important to determine if there are any structural or anatomic abnormalities present. Dynamic
abnormalities or problems that only occur at exercise will not be detected during the resting examination. The clinician may “get a sense” of what is happening at exercise but an evaluation of the airway at exercise is the only way to determine if a dynamic problem exists. The horse should be restrained but not sedated. Sedation can impact the function of the larynx thus making assessment difficult.¹ Common methods of restraint include twitch, lip chain, neck skin roll, and ear twitching.

To begin the resting endoscopic exam the endoscope is passed up the right nasal passage to the level of the nasopharynx. The nasopharynx should be evaluated for structural and functional abnormalities. The width of the nasopharynx at the level of the gullet pouch openings should be assessed. Horses that have collapse of the lateral pharyngeal walls during exercise often are very narrow at this location. Nasopharyngeal cicatrix formation can be seen as scarring ranging from a focal area to involvement of the entire circumference of the pharynx. This abnormality has been reported in horses from hot climates such as Texas, Louisiana, Mississippi, Oklahoma, and Florida. The ethmoid turbinates and nasomaxillary sinus opening should be examined. Abnormalities that could cause respiratory noise include an ethmoid hematoma that is causing an obstruction in the nasal passage or a mass protruding from the nasomaxillary opening obstructing the airway. The right gullet pouch should be evaluated. Abnormalities that could be encountered include gullet pouch empyema, chondroids, enlarged retropharyngeal lymph nodes, stylohyoid bone abnormalities, lymphoid hyperplasia and gullet pouch mycosis. These abnormalities do not directly cause abnormal respiratory noise but they may lead to a problem such as dorsal displacement of the soft palate. I then inspect the epiglottis. The epiglottis should be evaluated for any structural abnormalities. The most common abnormality would be epiglottic entrapment. Some clinicians take note of the length and consistency of the epiglottis as well. The ventral surface of the epiglottis should be evaluated for ulceration. This can be performed by elevating the epiglottic cartilage using a grasping instrument passed up the contralateral nasal passage. Topical application of lidocaine should be used to desensitize the area to facilitate the procedure

The degree of pharyngeal lymphoid hyperplasia should be characterized during the resting endoscopic examination. There is a grading system from one to four.² A Grade I would have a small number of inactive (white in color) lymphoid follicles spread across the dorsal aspect of the pharynx. A Grade II would have inactive as well as active lymphoid follicles (edematous and pink in color) spread across the dorsal aspect of nasopharynx to the level of the gullet pouch openings. A Grade III would have larger active follicles that may extend to the level of the soft palate. A Grade IV would have coalescing active lymphoid follicles. Having severe lymphoid hyperplasia does not directly cause abnormal respiratory noise but the severe inflammation may lead to problems such as pharyngeal collapse or dorsal displacement of the soft palate which would cause the abnormal respiratory noise.

Each arytenoid cartilage should be evaluated for structure, symmetry and movement. The shape and thickness of each arytenoid cartilage should be assessed. A granuloma can form on the axial surface of the corniculate cartilage while the remaining portion of the arytenoid cartilage or its movement is not affected. The movement of the arytenoid cartilages should be evaluated during
normal resting respiration, after swallowing, and during nasal occlusion. The goal is to determine if the structure of the arytenoid cartilages is normal and if the degree of abduction is normal. There is a grading scheme that is utilized to categorize arytenoid symmetry and movement. A Grade I has synchronous and symmetrical movement. A Grade II.1 has transient synchronous or asymmetrical movement but maximal abduction is easily achieved. A Grade II.2 has asynchronous or asymmetrical movement most of the time and maximal abduction is achieved but with difficulty. A Grade III.1 has asynchronous or asymmetrical movement and cannot maintain full abduction. A Grade III.2 has limited arytenoid movement and cannot fully abduct. A Grade III.3 has marked but not total abductor deficit. A Grade IV lacks any arytenoids movement (completely paralyzed).

Examine the right nasal passage as the endoscope is withdrawn. The nasal turbinates should be inspected for swelling, masses, or foreign material. The endoscope is then passed through the left nasal passage and the left ethmoid, nasomaxillary opening, and left guttural pouch are inspected. The trachea should be evaluated for signs of infection, hemorrhage, tracheal ring defects, granuloma formation, and for signs of prior trauma or surgery. In the typical 450kg horse the trachea can be examined nearly to the level of the tracheal bifurcation using a 1 meter endoscope. The left nasal passage is then examined as the endoscope is withdrawn. It is the author’s opinion that both nasal passages, both guttural pouches, and the trachea should be evaluated in each horse presented for a respiratory evaluation. Laryngeal ultrasound provides a non-invasive technique to gain additional information regarding the laryngeal cartilages and musculature. There are numerous upper airway abnormalities that can be diagnosed using standing endoscopy alone. However, a dynamic examination may be required to get the “full picture” of the horse’s airway.

References