

UPPER AIRWAYS ENDOSCOPY

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Scoping (upper airway endoscopy) is a common procedure performed in racing stables on a daily basis. Due to the importance of the airway for a racehorse to reach their athletic potential, the evaluation of the equine larynx is extremely valuable to evaluate animals with poor performance or airway noise. Traditionally, this procedure is performed using a fibre optic endoscope through a small eye piece. Now with the availability of digital imaging, images are able to be stored and reviewed to monitor changes that may have large impact on racing and performance. In the recent years, dynamic endoscopy or overground upper airway endoscopy has become more common; therefore allowing veterinarians to evaluate the upper airway function while the horse is working. Dynamic endoscopy is important because certain conditions are only observed or experienced while the horse is working. A thorough examination of the upper airway includes evaluating the pharynx, larynx, and trachea. The examination begins with upper airway endoscopy at rest and can proceed to dynamic endoscopy, if the cause of poor performance or noise while exercising is not explained, or further investigation is warranted.

PHARYNX

This is the first structure seen once the scope passes through the nasal passage. The pharynx joins the nasal passages to the larynx and lower airway. The base of the pharynx is comprised of the soft palate. Conditions such as dorsal displacement of the soft palate or pharyngeal collapse may be identified. The soft palate is critically important for stabilising the airway.

The position of the soft palate is mitigated by four major intrinsic muscles (tensor veli palatine, levator veli palatine, palatinus, and palatopharyngeal) and the major extrinsic muscles (genohyoideus, thyrohyoideus, geniglossus, hyoglossus, styloglossus, sternohyoideus, and stylohyoideus). Each of the muscles plays an integral role and has different nerves that innervate them. Small changes in the muscles due to nerve abnormalities or inflammation can lead to pharyngeal dysfunction. If the pharynx is not functioning properly, then the pharynx lacks stability causing turbulent airflow, noise, and poor performance. Each side of the pharynx displays the openings to the guttural pouches. Guttural pouches have diverticulum that require a guide wire or catheter to enter and are infrequently implicated in disease. They contain vital nerves and blood supply to the roof and sides of the pharynx. Although rare, infection or damage within these pouches can change the function of the airway.

LARYNX

The larynx is the central structure of the upper airway in the horse. When viewed through the endoscope, the larynx is comprised of a central epiglottis, a pair of arytenoid cartilages, vocal cords, and laryngeal sacculi. The function of the larynx is critically evaluated with particular attention to the arytenoid cartilages. Conditions such as laryngeal hemiplegia (paralysis of the left arytenoid cartilage) and arytenoid chondritis (infection of cartilage) can be identified. Laryngeal hemiplegia ("Roarer") is one of the most common diseases that are diagnosed and can have a major affect on racing performance. Horses with laryngeal hemiplegia cannot achieve maximal airflow, therefore hypoxemia (lack

of oxygen), hypercarbia (increase in carbon dioxide) and metabolic acidosis (increase in lactic acid) occurs at a faster rate than normal horses. Horses that work and race at speed for farther than 800 meters are significantly affected by obstructions of the upper airway. Reduction in the laryngeal aperture by 50 per cent increases the work of breathing 16-fold.

The epiglottis is the triangle shaped structure from the centre of the larynx. Size, shape, symmetry, and the way the epiglottis interacts with the soft palate is important. Epiglottic entrapment or sub-epiglottic cysts can be identified. The interaction with the soft palate is critical as a smaller epiglottis has been associated with epiglottic entrapment or dorsal displacement of the soft palate (DDSP) during exercise. Your veterinarian will look to see if all structures are visible, cartilage movement is normal, and to check there is no suggestion of infection.

TRACHEA AND LOWER AIRWAY

Once moving beyond the pharynx and larynx (and occasionally the guttural pouches) we enter the trachea. Within the trachea, we look for signs of mucus or bleeding. Inflammatory airway disease can affect racing performance therefore additional diagnostics such as bronchoalveolar lavage (lung wash) or trans-tracheal aspirate (trach wash) can tell us the type of inflammation or infectious agent. Depending what is seen on the lung or trach wash, treatment may be tailored for the individual horse.

Endoscopy is a valuable procedure for identification of early changes in horses in training or at sales. Multiple factors are required for horses to perform at the highest level but identifying changes early can help horses reach their athletic potential. ▣