

horses ^{and} people

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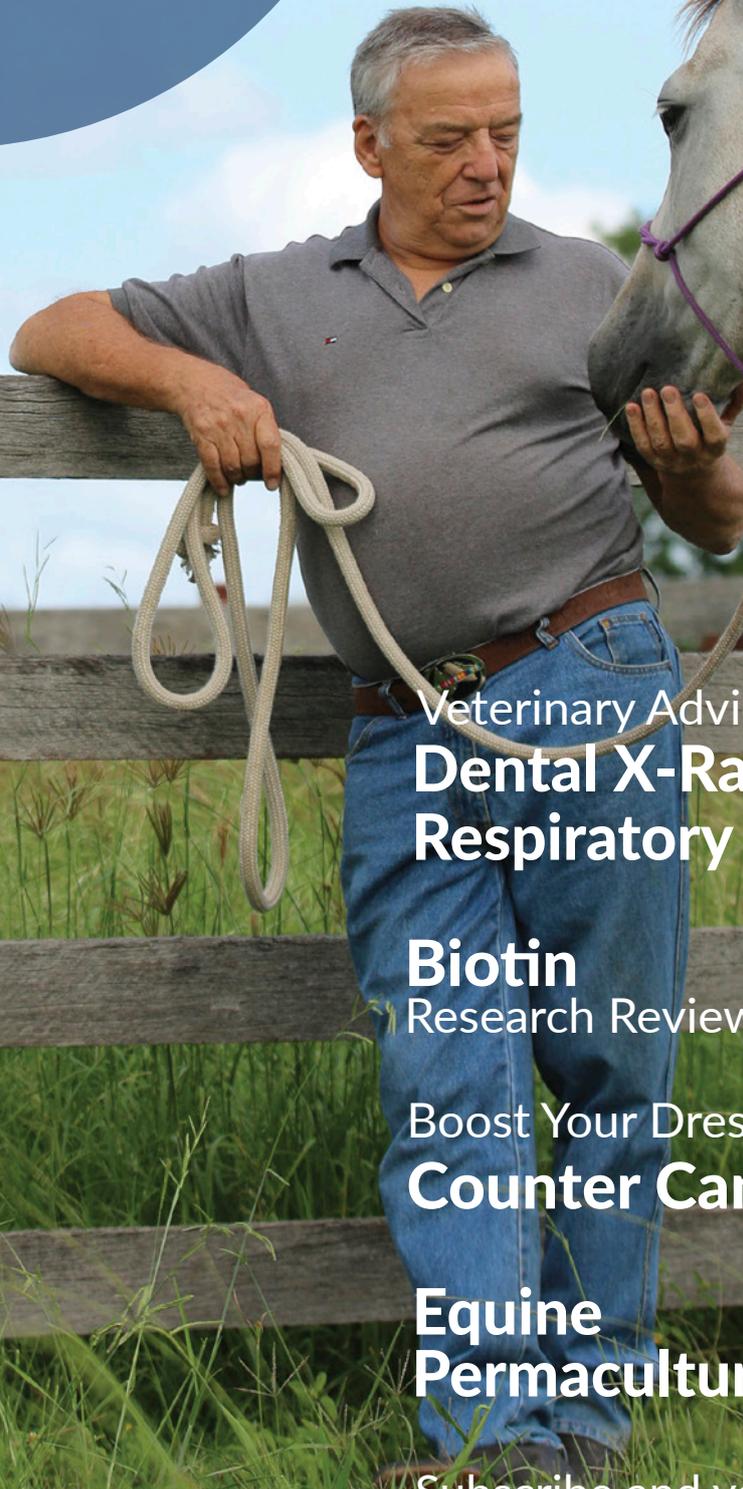
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Respiratory Conditions

Part Two



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Every day, your horse's respiratory tract is challenged by pathogens, such as bacteria, viruses and fungal elements. In the majority of cases, your horse's immune system and defence mechanisms easily overcome these small challenges without any external symptoms. Sometimes, however, when the challenge is too great or the defence mechanisms are overwhelmed, clinical infection and symptoms can result.

The anatomy of the respiratory tract has already been discussed in Part One of this series, but will be described in greater detail below in relation to specific conditions.

Types of pathogens

Viruses

As in humans, there are many viral pathogens that can cause respiratory infections in horses. A major culprit is Equine Herpes Virus (EHV), most notably type 1 and 4. Equine Rhinovirus is another player and I'm sure we all remember the outbreak of Equine Influenza (EI) in 2007.

Bacteria can run a muck in any and all anatomical regions of the respiratory tract and can jump on board when a viral infection has weakened the area's defences.

A horse with a viral respiratory infection will typically present with an elevated temperature (over 38.5 degrees), serious (watery) nasal discharge, and an increased respiratory rate and effort. They may also be heard to cough, and will likely have a reduced exercise tolerance and appetite. Of course, some horses can develop a secondary bacterial infection, due to a stressed and compromised respiratory tract, resulting in mucopurulent (thick yellow) nasal discharge.

Hendra Virus can certainly present with the respiratory signs mentioned above. However, we also know an infected horse can present with a wide variety of clinical signs, such as those seen in the neurological version with symptoms being ataxia and incoordination.

If your horse is unvaccinated and you find them in a compromised state with respiratory signs, Hendra Virus must be considered, and appropriate personal protective equipment and personal hygiene implemented before and after touching your horse. A more thorough discussion of the Hendra Virus would be best conducted in an article solely dedicated to this topic and will not be discussed further within this article.

Bacteria

Bacteria can run a muck in any and all anatomical regions of the respiratory tract and, as mentioned above, can jump on board when a viral infection has weakened the area's defences. The list of potential pathogenic bacteria is exhaustive. However, several notable culprits are discussed further below.

A bacterial respiratory infection can present with much the same clinical picture as a viral infection. However, your horse will typically have a mucopurulent nasal discharge. It is also worth noting that for a lower respiratory tract infection, the nasal discharge will be present in both nostrils. If there is only discharge from one nostril, the issue may be a little more complicated and localised to the upper respiratory tract in the sinuses or guttural pouches. This will be discussed further below.

Fungal

Fungal elements are commonly found in the respiratory tract. However, they rarely cause disease on their own. They rely on an underlying infection to weaken the horse's defence mechanism, so they may cause a secondary infection. Prolonged antibiotic or corticosteroid use may also predispose a fungal infection.

Infection can develop in the nasal passages causing fungal granulomas, within the sinuses, guttural pouches or the lungs. The clinical signs for a fungal infection are very similar to that of bacterial infection, so to differentiate between the two, a sample from the respiratory tract is necessary for a positive diagnosis.

Parasites

Interestingly, parasites can sometimes cause respiratory issues as well. The most interesting of which is Dictyocaulus arnfeldi, otherwise known as donkey lung worm. As the name suggests, this is a lung worm of donkeys, which can infect horses. It causes little concern in donkeys. However, in horses it can present as a chronic cough.



Every day, your horse's respiratory tract is challenged by pathogens, such as bacteria, viruses and fungal elements. Photo source: www.shutterstock.com.



ABOVE: Some pathogens specifically affect foals due to their age. A 'septic foal' refers to one with an overwhelming level of bacteria in their blood. Photo source: www.shutterstock.com.

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Pneumonia and pleuropneumonia

Pneumonia refers to infection within the lungs, whereas pleuropneumonia not only involves the lungs, but also the space around the lungs. The area between your horse's lungs and the inside of the thoracic cavity is referred to as the pleural space. The word 'space' is a bit of a misnomer as in a healthy horse there isn't actually a space and the lungs are suctioned to the thoracic wall.

This helps your horse inflate their lungs when breathing. In the case of pleuropneumonia, fluid accumulates in this space, which is why horses with this condition find it much harder to breathe and even walk without significant respiratory distress. They may also be reluctant to move as inflammation of the pleural lining (pleuritis) is painful.

In both pleuropneumonia and pneumonia, the lungs are affected and may develop abscesses or areas of consolidation. Consolidation is where the alveoli are full of inflammatory cells and can even have small areas of collapse. This means these areas are no longer helping the horse to absorb and exchange oxygen and carbon dioxide. Both conditions can be life-threatening, and require immediate and prompt intervention. Pneumonia can lead to pleuropneumonia if the infection is severe enough or not treated promptly.

Travel sickness

Travel sickness is a broad term used to refer to a group of illnesses that can follow transport of horses over long distances. These not only include pneumonia, but also colitis and colic.

There are several risk factors for developing a respiratory infection following travel. These include:

- Poor trailer ventilation,
- Restriction in their head movement, thus not allowing them to reach their head to the ground and clear their airways of inhaled debris including pathogens,
- Transport can be stressful and prolonged increases in cortisol levels will suppress the immune system,
- Decreased food and water intake will compromise the body's ability to conduct normal cellular activity,
- Confinement to a small area with other horses with potential to contract respiratory infections.

To help counter the risk of respiratory infections, long trips should be broken up into shorter trips to allow your horse to lower their head to the ground and clear their airways. Stopping every couple of hours and allowing your horse to rest overnight is ideal. Be sure to watch your horse closely during the week following travelling, especially in relation to respiratory rate, faecal output, appetite and rectal temperature.

Foals

Foals differ from adults in a couple of ways. They have some pathogens that specifically affect them due to their age. They can also become infected not only from pathogens inhaled into the lungs, but also from bacteria found in the blood stream (haemogenous spread). This is certainly a concern for any septic foals, i.e. those foals that have an overwhelming level of bacteria circulating in their blood stream.

This bacteria can decide to localise anywhere in the body from the joints, the gastrointestinal tract, growth plates or the lungs. Of course, young foals are at a higher risk of infection, due their naïve immune system, which has yet to develop antibodies to common challenges. This is why IgG from the mare's colostrum is so vital, with all foals recommended to have their IgG levels checked 24 hours after birth.

The level of IgG will give an indication of their risk of developing septicaemia and their immune system's capability of fighting infection. Regardless, all young foals should be watched closely and at the first signs of illness veterinary attention should be sought immediately.

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Rattles

Rattles is a foal specific respiratory infection, which gets its name from the rattling breathing and coughing heard from infected foals. It is caused by *Rhodococcus equi* and causes abscesses in the lungs of foals between the ages of 1-6 months. If left untreated, the condition can easily be fatal.

It presents with mucopurulent nasal discharge, coughing, increased respiratory effort and rate, and an elevated temperature. Treatment of rattles is with a combination of very specific antibiotics, so accurate diagnosis of the condition is important. This can be through radiographs and ultrasound of the lungs, as well as collecting samples from the lower respiratory tract to send to the lab for culture and sensitivity. Rattles is more commonly found in studs or properties with a larger number of horses and foals. It is interesting to note there is a type of plasma available that has additional antibodies targeted at preventing rattles.

Choke

Foals are very inquisitive and orally focused early in life, and can get themselves into trouble eating things they should not. Most notably, their mothers hay can sometimes get stuck in their oesophagus. This is referred to as choke and can present with spectacular nasal discharge, which owners can mistakenly take as a sign of respiratory infection. Nasal discharge from choke will normally contain feed material, as well as a large amount of saliva and even milk as the foal cannot swallow normally.

Although sometimes your foal will clear this blockage on their own, choke is still an emergency and will require your foal to be seen by your veterinarian as the longer your foal is choking, the greater the risk of them inhaling the excess saliva, food and milk. Once inhaled, this material forms the perfect medium for bacteria to establish a secondary aspiration pneumonia, which can be far more serious than the initial choke.

Strangles

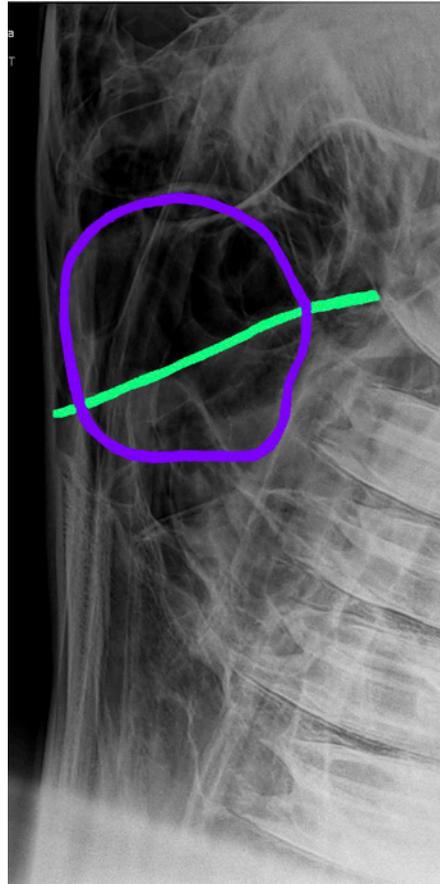
Strangles is caused by *Streptococcus equi* subsp. *equi* and is worth noting on its own, due its highly contagious nature. Strangles, as a disease entity, has been dealt with in previous articles and will not be gone into in depth in this article.



Pleuropneumonia

Ultrasound is obviously exceptionally useful in identifying pleural effusion. Any fluid between the lung and the thoracic wall will be easily identified and, if in significant quantities, will need to be drained.

Image courtesy WestVETS.



Strangles is a respiratory pathogen that causes an elevated temperature, enlargement of the lymph nodes, especially submandibular and retropharyngeal lymph nodes, and a mucopurulent nasal discharge. It gets its name from the potential for the enlarged lymph nodes to actually block air movement through the pharynx, thus 'choking' the horse.

It is more common in younger horses as their immune system is less likely to have been exposed to this pathogen in the past. It is spread through nasal excretions, as well as on contaminated tack and people. Diagnosis is made from clinical signs in combination with identifying the pathogen in the lymph nodes or guttural pouches on culture and sensitivity.

Sinusitis

The frontal and maxillary sinuses are part of the upper respiratory tract, and are located above the upper teeth and between the eyes. These can become infected primarily or secondarily to an inciting cause. In the case of secondary sinusitis, this can be caused by tooth root abscesses, which rupture into the floor of the sinus or by space occupying masses, such as sinus cysts.

Horses with a sinus infection will present with a unilateral (one sided) mucopurulent nasal discharge, which is typically quite malodorous. In more chronic cases, there can even be distortion of the bone over the sinus, due to the pressure within. Diagnosis is through oral examination, in combination with radiographs of the dental arcade and sinuses.

You may find treatment with antibiotics resolves the nasal discharge only to have it return weeks to months later. Unfortunately, systemic antibiotics on their own will not cure a sinusitis as the initiating cause must be resolved, e.g. tooth extraction or sinus cyst removal, and the sinuses will need to be flushed to remove the pools of pus accumulated.

TOP: In more chronic cases of sinusitis, there can even be distortion of the bone over the sinus, due to the pressure within. Diagnosis is through oral examination, in combination with radiographs of the dental arcade and sinuses. Photo courtesy WestVETS.

LEFT: Horses with a sinus infection will present with a unilateral (one sided) mucopurulent nasal discharge, which typically has a strong, foul smell. Image courtesy WestVETS.



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Treatment of respiratory infections will depend on the diagnosis, and can involve anything from anti-microbials to surgery and hospitalisation. Image courtesy WestVETS.

Guttural pouch disease

Guttural pouch empyema

Infection in the guttural pouch with bacteria is referred to as guttural pouch empyema. This can be a primary infection from inhaled pathogens or a secondary infection due to the rupture of abscessated retropharyngeal lymph nodes, as seen in horses with strangles. A horse with guttural pouch empyema will typically present with a predominantly unilateral nasal discharge with some discharge in the other nostril.

Guttural pouch mycosis

Infection of the guttural pouch with a fungal pathogen is referred to as guttural pouch mycosis. In this disease, plaques of fungus develop on the lining of the guttural pouch, which can erode into the wall. This is significant as there are several large blood vessels forming the lining of the guttural pouches.

Initial clinical presentation will be similar to guttural pouch empyema, but if the plaques erode into a blood vessel, there will be significant nasal haemorrhage, which normally results in death as the bleeding is unable to be controlled. There are other causes of nasal haemorrhage on a lesser scale, such as ethmoid haematomas and exercise induced pulmonary haemorrhage. These will be dealt with in Part Three of this series.

In both guttural pouch empyema and mycosis, treatment involves lavaging and medicating the pouch directly, as well as systemic medications, which often require hospitalisation and an extended period of treatment.

Diagnosis and treatment

A thorough physical exam will normally localise your horse's problem. However, sometimes further diagnostics are necessary to pin point the location or the full extent of the disease.

Ultrasound

Ultrasound examination of the thorax will identify any lesions on the surface of the lungs. Ultrasound waves do not pass through air, so any lesions deeper in the lung will be hidden by any air in the alveoli between it and the lung surface. Consolidated lung and surface abscesses are easily identified and help define the extent of the disease.

Ultrasound is obviously exceptionally useful in identifying pleural effusion. Any fluid between the lung and the thoracic wall will be easily identified and, if in significant quantities, will need to be drained. Ultrasound is also useful in the case of abscessated lymph nodes as seen in strangles.

Radiographs

Radiographs are particularly informative in issues involving the head, such as sinusitis. Due to the size of horses, we are not able to radiograph the chest as we can in cats and dogs. However, in foals, due their smaller size diagnostic images can sometimes be obtained.

Endoscopy

Endoscopy is where a camera is passed along the respiratory tract and allows us to visualise the nasal passages, guttural pouches, nasopharynx and the trachea down to its bifurcation into the primary bronchi. The endoscope also allows us to retrieve samples from targeted sites as mentioned below.

Samples for cytology, culture and sensitivity

Obtaining samples for cytology (cell type analysis), culture and sensitivity can be vital for the successful resolution of an infection. Ideally, samples should always be taken to identify the causative agent so that our treatment is as targeted as possible. Financial constraints can often restrict our ability to collect these samples and, in these circumstances, broad spectrum antimicrobial treatment are used. This is not as ideal as it can promote antimicrobial resistance.

Samples for cytology, culture and sensitivity can be collected in various ways, depending on the location of the disease and suspected pathogen. A small selection of methods include:

Treatment of respiratory infections will depend on the diagnosis, and can involve anything from anti-microbials to surgery and hospitalisation.

- A direct swab from the site, e.g. from the sinus through a trephined hole or from an abscessed lymph node.
- A guarded swab or wash through the endoscope, e.g. from the trachea or guttural pouches.
- Broncho-alveolar lavage. This is done with a tube that is placed deep into the lungs. This collects samples for cytology.
- A swab collected from the pleural cavity via ultrasound guided needle aspiration.

Treatment of respiratory infections will depend on the diagnosis, and can involve anything from anti-microbials to surgery and hospitalisation. The diagnostic tests above will identify the disease and allow your veterinarian to present you with a range of treatment options.

In Part Three of this respiratory series, Dr Linda Dillenbeck will discuss non-infectious conditions of the respiratory tract, such as inflammatory airway disease, ethmoid haematomas and left laryngeal hemiplegia.