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Ins and outs of equine housing

Generally, horses are stabled for human convenience; however, stabling is also sometimes essential for medical management of sick or injured individuals. Whatever the reason for stabling, horses have specific requirements of which Registered Veterinary Nurses (RVNs) must be aware.

Along with normal stable requirements, accommodation in an equine hospital warrants specific fittings, fixtures and cleaning protocols in order to maintain the health of the patients and the biosecurity of the practice.

Medical reasons for stabling

Stabling is an essential factor in the management of sick or injured horses, for example in the following situations:

- orthopaedic problems requiring box rest
- monitoring of sick patients requiring the horses to be stabled
- as a preventive measure for certain conditions such as laminitis, insect bite hypersensitivity or horses suffering from mud fever or rain scald
- in situations requiring isolation. (Linnenkohl and Knottenbelt, 2012)

General considerations

Size

Stabling can come in many forms and variations – from one or two loose boxes to large barns. There are some minimum requirements regarding dimensions that are standardised by the British Horse Society (BHS) and these are displayed in **Table 1**.

Walls

Walls can be made out of several materials. Wood may be the cheapest material, but



Figure 1. Brick is the most desirable stable building material.

it has disadvantages. It is:

- prone to being chewed by horses and rodents
- susceptible to damp
- invariably harder to disinfect
- a fire risk
- difficult to eradicate contagious pathogens – ringworm or infectious causes of diarrhoea, such as *Salmonella spp.*, from wooden structures. (Monsey & Devaney, 2012)

Brickwork is more expensive but is easier to keep clean and can be treated with antifungal paint or rubber (Monsey & Devaney, 2012) (**Figure 1**).

A cheaper option is to build up a brick base to prevent vermin and damp and put wooden sections on top. Breeze blocks are

the cheapest type of brick available (Scorer, 2006).

Floors and drainage

Floors are usually made of concrete as it is hard-wearing and relatively cheap. When laying concrete it is important to roughen the surface to prevent the horse from slipping.

Drainage must be considered when laying a floor in a stable. It may consist of a slope leading to a drainage hole at the base of the wall or the use of 'porcupipes', which are holes embedded in the floor leading into a system of pipes that carry fluid away (Scorer, 2006). If the floor slopes into a drainage hole, it is important to position it in a place where the horse cannot stand in it and injure itself. Drains are essential within and outside a stable to facilitate effective cleaning. They must always have covers on and these should be cleaned out daily to reduce the build-up of waste products.

Ventilation

Ventilation is important to avoid draughts at ground level – which can cause a chill – yet maintain a through-flow



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HOUSING

Table 1. Recommended stable dimensions (Monsey & Devaney, 2012)

Type/size of horse	Minimum dimensions
Ponies (up to 14.2 hands)	3.05m x 3.05m
Horses (up to 16.2 hands)	3.65m x 3.65m
Large horses (>16.2 hands)	3.65m x 4.25m
Foaling boxes	4.25m x 4.25m

of air to prevent a build-up of bacteria and reduce the transmission of airborne infection (Scorer, 2006). There are two types of ventilation – passive and active.

Passive ventilation:

- can be achieved by keeping the top door of the stable open to allow air to pass through and up into the apex of the roof
- air vents allow the air to pass out and fresh air is then drawn in through the door, maintaining a cycle
- the heat from the horse rises upwards and further encourages this cycle – this is called the ‘stack’ effect
- windows should be located on the same side as the door to prevent through draughts but provide light

- windows should be hinged at the bottom and open outwards. There should be a wire mesh or iron bars covering the glass to prevent the horse from injuring itself on the glass (Figure 2)
- the glass itself should be wired safety glass. (Scorer, 2006)

Active ventilation:

- pulls air mechanically into and/or out of the stable, usually by the use of an extractor or air-conditioning system (Scorer, 2006)
- is expensive and, as a consequence, rarely seen in equine accommodation.

Recurrent airway obstruction (RAO)

This condition is relevant to RVNs as horses are often admitted to the hospital

with RAO as a secondary condition. It is very important for RVNs to be able to recognise and manage horses with RAO as part of a holistic nursing approach.

RAO is a chronic respiratory condition where the horse develops a sensitivity to dust antigens in the environment (Scorer, 2006). When horses with RAO are exposed to allergens, a complex inflammatory cascade is initiated which results in:

- airway inflammation
- increase in the volume and viscosity of airway discharge
- increased numbers of inflammatory cells (neutrophils) in the airways
- Bronchospasm. (Slater & Knowles, 2012)

Typically RAO is seen in stabled horses and is often



Figure 2. There should be a wire mesh or iron bars covering glass in stables to prevent horses from injuring themselves.

linked to moulds in hay and straw. Horses at grass can also develop sensitivity to pollen – known as summer pasture-associated obstructive pulmonary disease (SPAOPD) – with similar clinical signs to

horses suffering from RAO. Good stable ventilation is particularly important to help reduce the risk of horses developing RAO.

Symptoms

The horse will develop a cough and display poor performance when ridden. Mucus is brought up, but there should be no elevation in temperature. Eventually the horse will begin to have difficulty breathing and will wheeze as the airways in the lungs narrow (Scorer, 2006).

Affected horses may also develop a ‘heave line’ (hypertrophy of abdominal muscles resulting from chronic and severe dyspnoea) (Slater & Knowles, 2012).

Treatment

Treatment for RAO includes environmental management – keeping the horse turned out as much as possible, using dust-free bedding and soaking hay or feeding haylage. Bronchodilators are used to reverse bronchoconstriction and improve ciliary clearance (Slater & Knowles, 2012). These agents can be given as an oral medication in feed or used as an inhaled drug.

Corticosteroids are also used to block the inflammatory cascade; however, there is a risk of laminitis associated with the use of these drugs (Slater & Knowles, 2012). Overall prevention is – as always – much better than cure with RAO and this can be achieved if close attention is paid to good ventilation, and use of dust-free bedding and dust-free forage.

Bedding

Bedding is used to provide warmth and comfort to the horse. A bank of bedding should be built up around the edge of the stable (Figure 3) to reduce draughts, provide comfort and to help prevent the horse getting cast (stuck against the wall).

The ideal bedding should be:

- warm
- absorbent

- soft
- easily managed
- non-toxic
- dust/damp free
- readily available
- easily disposed of and recycled (Scorer, 2006).

Table 2 shows the types of bedding available and the advantages and disadvantages associated with each.

Bedding for special cases

Patients often have specific bedding requirements according to the condition from which they are suffering. It is important to understand the different requirements of these patients, in order to be able to prepare appropriate accommodation quickly and effectively.

RAO

The most important aspect of treating RAO is to remove the cause of the problem – the dust, mould and/or pollen usually found in hay and straw (Scorer, 2006). These horses should be fed haylage or soaked hay. However, the more moisture that is contained in the bedding, the more likely it is to become mouldy.

Straw should be substituted with hardwood dust-extracted shavings, paper, peat or rubber matting.

Laminitis

This is inflammation of the laminae of the foot. The feet receive an inadequate supply of blood and this in turn damages the blood vessels, causing inflammation and pain (Scorer, 2006).

Horses with laminitis need to be stabled and will require soft, supportive bedding such as shavings. As these horses also like to lie down a lot, rubber matting should be used with a deep bed on top (Scorer, 2006). The bedding should be continued all the way up to the door and food and water situated close together.



Figure 3. A bank of bedding should be built up around the edge of the stable to reduce draughts, provide comfort and to help prevent the horse getting ‘cast’ (stuck against the wall).

Colic

It is vital that these patients do not have access to edible bedding, as they may need to be starved. Shavings, peat or paper can be used; and a deep bed should be supplied, with banks as the horse is likely to want to get down and roll (Scorer, 2006).

The patient should be put in a part of the hospital where it can be monitored easily.

Lighting

Lighting may be natural or artificial. Natural lighting is achieved by using windows, skylights and leaving the top half of the stable door open; but to ensure that owners and staff can see adequately, some form of artificial lighting must also be available (Scorer, 2006).

The most common form of artificial lighting is a fluorescent strip light attached to the eaves of the roof; and hanging light bulbs are not advised as the horse may be able to reach them with serious consequences. Light switches should be placed outside the stable and protected from moisture with a waterproof cover; and all cables inside or outside the stable should have sufficient waterproof coverings (Scorer, 2006).

Heating

Healthy horses can tolerate a wide range of temperatures as long as the air remains dry and draught free. Sick or

injured horses, however, and neonatal foals may require the use of supplementary heating, examples of which are listed below:

- rugs and bandages – indoor and outdoor rugs are available for all shapes and sizes of horse, pony or foal. Bandages should be applied securely and the use of ‘gamgee’ underneath will reduce the risk of the patient developing bandage sores
- duvets – commonly put under a stable rug to add extra warmth. Ensure the duvet is secured correctly to prevent slipping
- central heating – effective but very expensive, so rarely used. Heating units should be kept out of the horse’s reach
- electric fans – can be noisy and create dust. Ensure that the unit is kept out of the horse’s reach.
- infrared heat lamps – can be small, portable or permanent fixed to the wall (Figure 4). Either must be a safe distance away from the horse (Scorer, 2006).

Fittings

Some fittings are required for all stables. However, equine hospitals will need some more specific fittings and equipment. Care should be taken to ensure that all fittings are secure and placed in an area that is convenient for staff but will not endanger the horse:

Table 2. Types of bedding [Scorer, (2006) and Linnenkohl & Knottenbelt, (2012)]

Type of bedding	Comments	Advantages	Disadvantages
Straw	Barley straw may be eaten so wheat straw is more commonly used as it is less palatable	Good insulating properties. Inexpensive to buy. Easily disposed of and recycled	Dusty, therefore can increase the risk of RAO. May harbour spores. Barley and oat straw can be eaten and may cause impactions
Shavings	Used as an alternative to straw Bought in bales	Absorbent and can be bought dust-extracted so better for horses with RAO. Provides warmth	More expensive than straw. More difficult to dispose of waste. Will compost down in time
Sawdust	Used as an alternative to straw Bought in bales	Absorbent and provides warmth	More expensive than straw. More dusty than shavings. More difficult to dispose of waste. Will compost down in time
Paper	Can buy in bales or shred newspapers yourself	Absorbent and dust free. Reasonably warm	More expensive than straw. More difficult to dispose of waste. Will compost down in time
Peat moss	Used as an alternative to straw Bought in bales	Inedible. Dust free. Easily recycled. Reasonably warm	More expensive than straw. Can soften the feet. Environmental issues – becoming less readily available
Hemp	Used as an alternative to straw Bought in bales	Dust and mould free. Warm	Expensive and can be eaten
Rubber matting	Surface is anti-slip and lower Surface has drainage channels Buy as mats	Cheap to maintain after initial purchase. Good drainage and supports horse’s feet. Can provide warmth	Initial cost is expensive. Little warmth if used alone; therefore, will need to purchase additional bedding



Figure 4. Permanent heat lamps are a good source of supplementary heat for sick horses.

- hooks are required on the top and the bottom of the stable doors to hold them open and prevent them from slamming, which will frighten horses
- bolts on both doors – one on the top door and two on the lower door. A kick bolt is advised for the lower bolt to prevent clever horses who undo their top bolts to escape!
- metal strips are required on the horizontal part of the lower door to prevent the horse from chewing the wood
- tying rings should be placed at the front of the stable at the horse's eye level. Hay nets can be tied straight on to the tie ring. When tying a horse up the horse must always be attached to bailing twine, not the tie ring. If the horse panics the bailing twine will snap and release the horse
- automatic water bowls are not usually used in an equine hospital. Whilst they do save on labour, the main disadvantage is that it is not possible to monitor how much the horse is drinking (Scorer, 2006). This is not ideal for RVNs when monitoring sick patients. Usually a large water bucket is supplied as horses will drink approximately 20-40 litres of water per day under normal circumstances (Scorer, 2006). Water should be changed frequently as it does absorb ammonia from the bedding, and the water bucket should be emptied and disinfected at least once daily for every patient
- feed troughs and mangers may be concrete, wooden or plastic. These fittings are useful for patients that cannot have a hay net –

The mucking out process

- the horse should be removed from the stable and either tied up outside or put in another box. This is safer for the person mucking out and for the horse as it can't injure itself on any of the equipment
- water buckets should be removed and disinfected before being refilled and put back once the stable has been mucked out
- hay nets and discarded/uneaten hay should be removed
- starting at the front of the stable, any droppings should be removed and put on the wheelbarrow
- the remaining bedding should be forked up so that any further droppings can fall down. These should be removed
- any urine soaked bedding should then be removed. Clean bedding should be put to one side to be re-used
- the floor should be swept and left to dry before the clean bedding is spread back on to the floor. Fresh bedding should be applied on top, if required
- banks can be built if needed and the front of the bed should be swept back into a straight line. The bed should be thick enough so that if a fork is stabbed in to it, the floor cannot be felt
- the clean water bucket and fresh hay net can then be replaced (Monsey & Devaney, 2012).

foals and patients with eye ulcers. Feed troughs and mangers must be placed high enough for the horse to feed comfortably but not so high that they can't reach the food and they must be cleaned out and disinfected regularly to reduce contamination (Scorer, 2006)

- fluid hangers are hooks attached to the ceiling for suspending fluid bags for intravenous (IV) administration and other medications (Figure 5). Ideally, an overhead pulley system is used to raise and

lower the fluids when the bags need changing, and a spiral giving set allows the horse to move freely around the stable (Scorer, 2006)

- door grills are used to prevent the horse from being able to get its head over the stable door (Figure 6). These are used for patients with indwelling IV catheters. As the jugular vein is most commonly used for catheters in horses, the grill is used to prevent the catheter on the door and/or pulling it out.

Figure 5. Fluid hangers are hooks attached to the ceiling used for suspending intravenous fluid bags.



Figure 6. Door grills are used to prevent the horse from being able to get its head over the stable door and damage indwelling intravenous catheters.



Cleaning stables

It is very important that stables are 'mucked out' regularly and correctly to preserve the health of the in-patients and to prevent the spread of disease. As a general rule, stables are mucked out properly once daily in the morning and then 'skipped out' (all the faeces are removed but none of the urine) in the afternoon.

Each yard should have designated equipment such as a wheelbarrow, fork, yard brush and 'skip' and these can be colour coded for easy identification. This equipment should be disinfected on a daily basis.

Disinfecting stables

After each horse is discharged, its stable should be emptied of all bedding and then disinfected with an appropriate solution. In the case of horses with an infection, the stable should then be swabbed for culture, and cleaning repeated as necessary. (Monsey & Devaney, 2012)

All rugs, brushes, head-collars and lead-ropes, hay nets and water buckets used by the horse should be thoroughly washed and disinfected. It is very important that protocols are in place for the mucking out, maintenance and disinfection of stables and equipment in the hospital. Creation and implementation of these protocols would normally fall under the responsibility of an RVN.

Conclusion

Horses require specialised housing in general, and requirements are even more specific for equine hospital accommodation. Therefore, an RVN should have a good working knowledge of the requirements for accommodation in an equine hospital, including the size of the stable, bedding type and ventilation together with more specific requirements, such as access to a fluid hangers and heat lamps.

A broad knowledge of equine veterinary conditions is also required so that the correct accommodation can be prepared for each patient to suit their individual requirements.

RVNs are also required to produce protocols for the cleaning, disinfection and maintenance of equine

hospital accommodation. These protocols will help ensure that the health of the in-patients and the biosecurity of the equine hospital are both maintained effectively. ■

PPD questions

1. How large should a foaling box be?
2. What does RAO stand for?
3. Which type of bedding is not suitable for a colic patient?
4. Why are automatic water bowls not generally used in equine hospitals?
5. How often should a stable be cleaned out every day?

Answers
 1. 4.25m x 4.25m
 2. Recurrent airway obstruction
 3. Straw
 4. Water intake cannot be accurately monitored with automatic water bowls
 5. At least twice – they should be mucked out in the morning and skipped out in the afternoon

References

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