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Nursing the equine colic patient

Colic is a serious disorder that is encountered relatively often in equine practice. Along with the correct diagnosis and treatment, specialist nursing care is required to give patients the best chance of recovery. The registered veterinary nurse (RVN) caring for these patients must have a good knowledge of equine behaviour, the anatomy of the gastrointestinal (GI) tract and of the presenting condition.

The term colic refers to abdominal pain and is not a specific diagnosis. **Table 1** displays the various causes of colic in the horse. Initial assessment aims to separate the alimentary causes from the non-alimentary causes (Slater and Knowles, 2012).

Most colics occur as a consequence of alimentary disease and the majority (approximately 90 per cent) do not require surgery. These are called medical colics and they require only medical management. Clinical signs for medical colics tend to be – but are not always – less severe than those for surgical colics (Slater and Knowles, 2012).

Medical colic cases
Hospitalised horses are at particular risk of developing colic and should be monitored very carefully even if they have been admitted for an unrelated disorder. It is very important that the RVN takes details of the current diet from the owner, as dramatic changes in feeding can cause an impaction colic to occur.

Horses that are on ‘box rest’ are also at risk of developing an impaction colic, as a result of decreased gut motility; and those that have undergone a general anaesthetic for orthopaedic surgery present a particularly high risk of developing a caecal impaction (Barr and Jones, 2012).

With any medical colic, the horse should not be allowed to become too violent in its movements or to roll frequently because this may result in injury to both the horse and its handlers (Slater and Knowles, 2012).

Spasmodic colic
Spasmodic colic is the most common type of medical colic. The pain is the result of intestinal spasm, so horses have intermittent bouts of moderate to severe pain and yet are often normal or quiet between episodes.

Treatment includes the administration of analgesics and spasmolytics and diet should be restricted – the

patient being fed bran mashes, grass and hay only for 24 hours (Slater and Knowles, 2012). These cases are rarely admitted into an equine hospital and are usually resolved in the yard.

Tympanic/flatulent colic
This type of colic is caused by gut distension with gas – usually in the caecum and colon – following feeding on highly fermentable feeds. Pain is intermittent to moderate, becoming more severe and continuous (Slater and Knowles, 2012) and treatment is the same as for spasmodic colic.

These patients often benefit from a ride in a trailer/horsebox as this often stimulates elimination of the built-up gas from the GI tract, such that the colic has resolved once they arrive at the hospital.

Colonic impactions
Patients with colonic impactions are more commonly admitted into the hospital for treatment and nursing care. The impactions usually occur at the pelvic flexure and are predisposed by situations that result in decreased gut motility, such as:
■ decreased water intake – a frozen water trough, for example eating bedding or sand
■ diet change when the horse is stabled for the winter
■ poor dentition
■ inactivity – box rest, for example parasitism.

The pain is progressive, initially vague and intermittent, becoming mild/moderate and continuous. Horses lie quietly, occasionally roll and become more active as the gut distends (**Figure 1**). Faecal production is commonly reduced (Slater and Knowles, 2012).

Treatment includes:
■ analgesics
■ turning the horse out or lunging to promote gut activity and relieve the impaction
■ restriction of further feed intake
■ intravenous (IV) and oral fluids
■ stomach tubing with laxatives, such as paraffin or Epsom salts.

The RVN should monitor these patients on a regular basis in order to ensure that any complications or deterioration is identified and treated in a timely manner. The important clinical factors to assess and monitor for colic patients are set out in **Table 2**.

Auscultation of the equine abdomen
To auscultate the abdomen, the stethoscope is placed on the four major sites that include the left and right lower and upper paralumbar regions (**Figure 2**). Borborygmi give an indication of the status of the GI system.

The sounds should be heard in all four quadrants and will be more frequent on the left side, where most of the large colon is located. The right

upper quadrant is dominated by sounds from the caecum, which makes gentle mixing sounds interspersed about every two minutes by a sound similar to a flushing toilet.

Quiet borborygmi may be indicative of decreased motility, abdominal pain or abdominal disease; whereas very active borborygmi may be indicative of pending diarrhoea or spasmodic type abdominal pain. (Rowe et al, 2008; Snalune and Paton, 2012)

Most colonic impactions can be treated successfully with medical interventions. However, a small number can require surgical intervention,

Surgical colic cases
Table 3 shows the different types of surgical colic encountered in equine patients. Information that will be useful from a nursing perspective can be gleaned from the case veterinary surgeon, including findings on rectal examination, abdominal ultrasonography and paracentesis (Boys Smith and Millar, 2012).

Colic surgery preparation
RVNs play a significant role in the preparation of equine colic patients for surgery.

The horse should be weighed or its weight estimated and the shoes should be removed, if it is safe to do so. This will help to prevent damage to the horse, operatives and the

‘knock-down’ box. An (IV) catheter should be placed in either the left or the right jugular vein using sterile techniques (**Figure 3**) and broad-spectrum antibiotics should be administered. If the horse is severely dehydrated, pre-operative treatment with hypertonic saline may be required.

While the horse is sedated, a stomach tube should be passed and attempts made to decompress the stomach from fluid and gas. This tube is often left in place during the surgery. The mouth must be thoroughly rinsed out to enable clear passage of the endotracheal (ET) tube.

If time permits, the horse should be brushed and the ventral abdomen clipped to decrease the preparation time once anaesthesia has been induced (Boys Smith and Millar, 2012).

Postoperative care
Following recovery from anaesthesia, the horse requires intensive medical therapy and very close, regular monitoring in order to identify complications early on. Any case can develop complications and all require a dedicated team of vets and nurses – often working anti-social hours – to care for them properly (Boys Smith and Millar, 2012).

Critical care monitoring (24-hour commitment)
Record sheets are essential in systematically recording the physical and laboratory data

Table 1. Causes of colic in the horse (Slater and Knowles, 2012)

Alimentary tract	Non-alimentary tract	Conditions resembling colic
Spasmodic colic	Peritoneal pain (peritonitis, abdominal abscess)	Myopathies (rhabdomyolysis)
Tympanic colic	Liver disease (ragwort poisoning, cholelithiasis)	Laminitis
Colonic impactions	Urinary (renal calculi, pyelonephritis, bladder calculi)	Other orthopaedic conditions (e.g. bilateral flexor tendon rupture)
Small intestinal obstruction (e.g. torsion, herniation, intussusception, pedunculated lipoma)		
Large intestinal obstruction (e.g. torsion, displacement, entrapment)		
Gastroduodenal ulcers and neoplasia		
Grass sickness		
Proximal enteritis		
Other causes of severe enteritis (e.g. Salmonella)		



*Suggested Personal & Professional Development (PPD)

COLIC



Figure 1. Horses with colonic impactions lie quietly, occasionally roll and become more active as the gut distends.



Figure 2. To auscultate the abdomen, the stethoscope is placed on the four major sites that include the left and right lower and upper paralumbar regions.

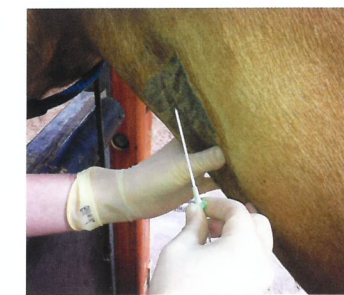


Figure 3. IV catheters should be placed using sterile techniques in either the left or the right jugular vein.

Table 2. The most important clinical factors to consider when investigating a horse with colic (Boys Smith and Millar, 2012)

Clinical factor	Clinical significance
Pain attitude and response to medication	A horse that continues to be in pain despite adequate analgesia requires further investigation. A sudden reduction in pain observed with depression, a rapid increase in heart rate and profound sweating may indicate intestinal rupture
Heart rate (HR)	Mainly influenced by hypovolaemia and endotoxaemia. Pain has a small, direct effect on HR, which varies during the course of the disease. Generally, the higher the HR, the more serious the disease: <ul style="list-style-type: none"> ■ <40 beats per minute (bpm): very mild disease ■ 40-60 bpm: mild to moderate disease ■ 60-80 bpm: moderate (be concerned) ■ >80 bpm: serious
Respiratory rate (RR)	The RR increases and the breaths become shallower with an increase in disease severity. The RR is also increased by excitement, metabolic acidosis and pain. Respiratory embarrassment can also occur with severe abdominal distension
Rectal temperature	Generally not affected by the degree of pain. Often increased by infection (e.g. <i>Salmonella</i> , peritonitis, anterior enteritis) and can be decreased with advanced ischaemic conditions
Mucous membrane colour	Varies with hydration and physiological status: <ul style="list-style-type: none"> ■ pale: simple dehydration ■ congested/hyperaemic (vasodilation): endotoxic ■ cyanotic (vasoconstriction): advanced endotoxic shock
Capillary refill time	A measure of perfusion, determined by how long it takes for a depression in mucous membrane to return to normal colour. normal: 1-2 secs mild to moderate dehydration: 3-4 secs severe dehydration: 5-6 secs
Systemic haematology: packed cell volume (PCV), total protein (TP), lactate biochemistry	PCV and TP are important factors in measuring the hydration status but also give information regarding prognosis. Both are increased by dehydration and PCV is influenced by splenic contraction. TP can also be increased during chronic inflammation. Intestinal hypoperfusion increases lactate levels owing to anaerobic metabolism. <ul style="list-style-type: none"> ■ mild dehydration (6%): 43-50 PCV (%): 80-82 TP (g/l) ■ moderate dehydration (8%): 50-55 PCV (%): 83-90 TP (g/l) ■ severe dehydration (10%): >55 PCV (%): >90 TP (g/l)
Hydration status	Skin tenting is a crude indication of hydration status and varies with age
Abdominal auscultation (gut sounds)	All four quadrants should be auscultated. Normal or increased sounds are a good sign. Persistently decreased or absent sounds are a poor sign
Abdominal distension	Gross abdominal distension is sometimes evident when the intestine, particularly the large intestine, is distended
Appetite, thirst, faecal and urine output	A normal appetite, thirst, faecal and urine output are all good signs. Appetite and faecal output are often the first two signs that a complication is developing
Results of nasogastric intubation	Obtaining more than 2-3 litres of nasogastric reflux indicates either an obstructive or functional obstruction of the small intestine. Surgery is commonly required

collected at each examination. The RVN should monitor the following parameters in the postoperative colic patient (Boys Smith and Millar, 2012):

- evidence of pain – obvious or subtle (abdominal guarding, for example, temperature, pulse and respiration
- PCV, TP and blood lactate levels
- circulating white blood cell count
- defaecation – amount,

- consistency and frequency
- urination – volume, colour and frequency
- presence of gut sounds
- appearance and integrity of surgical wound – oedema, discharge or breakdown
- nasogastric intubation – checking for reflux
- abdominal distension
- ability to ambulate and general demeanour
- heat and digital pulses in the feet.

All treatments must be recorded, including the amount of fluids administered. The frequency of checks is decided by the case veterinary surgeon. Normally a horse recovering from colic surgery would benefit from critical care checks every two to three hours until its condition stabilises and improves (Boys Smith and Millar, 2012).

IV catheter care

Catheter care is of the utmost importance in enabling efficient fluid therapy, drug administration and intravenous access in an emergency.

Patients suffering from a condition that causes a hypercoagulable state – such as endotoxaemia or large intestinal disease – are more likely to develop thrombophlebitis (Dolente et al, 2005). Thrombophlebitis is one of the most frequently reported catheter site complications in horses and is recognised as thickening within or around the vein, pain, discomfort, heat and swelling at the catheter site (Geraghty et al, 2009).

Meticulous care of IV catheters is essential and daily monitoring includes (Boys Smith and Millar, 2012):

- checking vein patency
- observing for heat, pain, swelling or exudate
- checking catheter patency
- flushing the catheter with heparinised saline at least every six hours (Figure 4)
- checking for leaks, clots,

Table 3. Types of colic seen in equine patients (Boys Smith and Millar, 2012)

Area of GI affected	Simple lesion	Strangulating lesion
Stomach	Impaction, pyloric stenosis	
Small intestine	Non-strangulating lipoma, hernia, impaction, intussusception, stenosis, adhesions, neoplasia, abdominal abscess, equine grass sickness, muscular hypertrophy of the ileum	Strangulating pedunculated lipoma, volvulus, internal hernia (epiploic foramen, gastrosplenic, mesenteric/omental/broad ligament defect, diaphragmatic), external hernia
Large intestine	Impaction, enteroliths, left dorsal displacement (nephrosplenic entrapment), right dorsal displacement, <270° colon torsion	Colon torsion (>270°), intussusception (caeco-colic), hernia
Caecum	Impaction, infarction	Intussusception, hernia
Small colon	Impaction	Strangulating lipoma, mesocolonic tear/rupture, hernia

- missing sutures, damage to – or kinking of – the catheter
- wiping the catheter cap with surgical spirit prior to any injections
- changing the injection cap every 24 hours
- changing giving sets and extension sets if damaged or contaminated
- changing protective bandage/dressing every 24 hours
- removing the catheter if any adverse signs are identified.

If a jugular vein is showing signs of thrombophlebitis, it must no longer be used – so the lateral thoracic vein is the next choice for catheter placement. Jugular veins can be monitored with ultrasound to help identify the early signs of thrombus and thrombophlebitis (Rippingale and Fisk, 2013). RVNs can carry out these ultrasound examinations.

Fluid therapy

As most postoperative colic patients require limited oral fluid intake, the initial daily fluid requirement must come from intravenous fluid administration. The total volume and rate of fluids administered to the patient must be documented accurately by the RVN.

Daily serum electrolyte tests may indicate the need for supplementation. Adjustments to fluid rates should coincide with the progress of the patient and haematology findings (Boys Smith and Millar, 2012).

Medication

Medication is essential in preventing and treating postoperative complications uniquely associated with the critically ill colic patient. It is usually commenced before surgery.

Non-steroidal anti-inflammatory drugs (NSAIDs) – most commonly flunixin meglumide and phenylbutazone – are used frequently in the management of postoperative surgical colic patients. They are administered in small doses to reduce the effects of endotoxaemia, provide analgesia, reduce inflammation and to prevent the depressive effects of endotoxins on gut motility.

The RVN must monitor signs of pain in the postoperative surgical colic patient and update the case veterinary surgeon regularly on progress (Boys Smith and Millar, 2012).

When antimicrobial therapy is employed, the RVN should ensure that an accurate weight and dose rate is obtained for the patient. Injections of – or a combination of – aminoglycosides, penicillins

and cephalosporins are most commonly used. Metronidazole is used to treat suspected anaerobic infections.

Other specialist medication includes pro-kinetic drugs, such as lidocaine, metoclopramide and erythromycin, to help stimulate gut movement; together with anti-endotoxic therapy, such as plasma and polymixin B. Anti-thrombotic drugs, such as heparin and aspirin, are also administered, and amounts and frequency of dosing must be recorded by the RVN (Boys Smith and Millar, 2012).

Abdominal support bandage ('belly band')

A 'belly band' can be applied to support an abdominal wound. The RVN should change the belly band twice daily and more often if there is a copious amount

Figure 4. IV catheters should be flushed with heparinised saline at least every six hours.**Figure 5.** Daily grooming can significantly improve the demeanour of an equine colic patient.

of drainage. Care should be taken in geldings/stallions that urine does not contaminate the belly band and, therefore, the abdominal wound (Boys Smith and Millar, 2012).

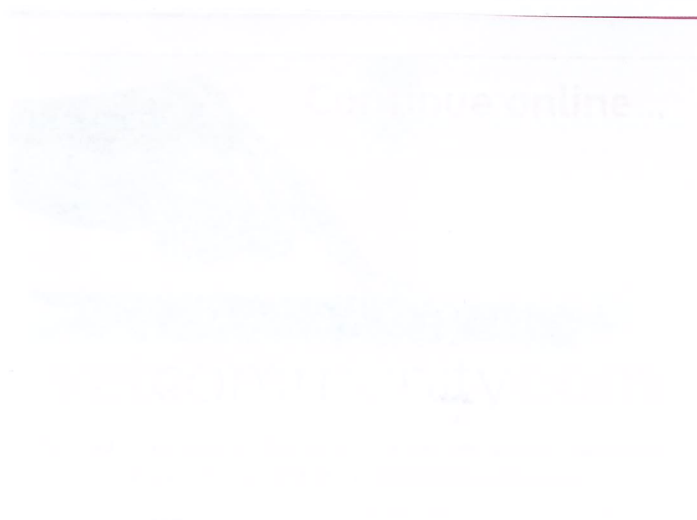
General nursing duties

Some simple procedures carried out by the RVN can significantly improve the demeanour of an equine colic patient (Boys Smith and Millar, 2012). These include:

- daily grooming (Figure 5)
- periodic rinsing out of the mouth with fresh water (flavoured with mints) if the horse is being starved for any length of time
- walking out to encourage interest in surroundings
- use of rugs, sheets and heat lamps to help retain body heat
- provision of a clean, deep-bedded, well-ventilated stable at all times
- provision of plenty of TLC (Figure 6). ■



Figure 6. TLC is an important component of nursing care for colic patients.



PPD Questions

1. Why are horses on box rest more likely to develop an impaction colic?

2. Where in the GI tract is an impaction colic most likely to occur?

3. What do very active borborygmi (gut sounds) indicate?

4. Name three clinical signs of thrombophlebitis

5. Name three simple nursing procedures that can significantly improve the demeanour of an equine colic patient

Answers
 1. Box rest causes a decrease in intestinal motility in horses
 2. At the pelvic flexure
 3. Pending diarrhoea or spasmodic type abdominal pain
 4. Thickening within or around the vein, pain, discomfort, heat and swelling at the catheter site
 5. Daily grooming; periodic rinsing out the mouth with fresh water (flavoured with mints); walking out to encourage interest in surroundings; use of rugs, sheets and heat lamps to help to retain body heat; provision of a clean deep-bedded, well-ventilated stable; plenty of TLC

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