Immediate postoperative recovery of the surgical patient – part two

Author : Stacey Crompton, Paula Hill

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Stacey Crompton HE Dip, CVN, AVN(Small Animal), RVN, and **Paula Hill** VN focus on how nursing plans tailored to individuals may optimise recovery, together with fluid therapy considerations

Summary

AS DISCUSSEDin part one, fatality in dogs and cats can occur in the immediate postoperative recovery period (*VN Times 1*1.10; October). Patient monitoring, the effects of anaesthesia, and pain and analgesia were also detailed. Part two will discuss fluid therapy and nursing care, which, if optimised, may benefit postoperative patients recovering from anaesthesia. Veterinary nurses are now encouraged to nurse patients according to their individual needs. The medical model of care should still be provided to the patient; however, incorporating a nursing plan and a holistic approach to care in the form of an individualised recovery nursing care plan will ultimately benefit the patient.

Key words

care plan, holistic nursing, IVFT, individualised care, veterinary nursing, fluid therapy

FOLLOWING on from part one of this article (*VN Times* 11.10; October), which covered aspects of monitoring, the effects of anaesthesia, and analgesia provision, this article highlights the importance of tailored nursing care plans and fluid therapy in the

postoperative recovery period.

Fluid therapy

Intravenous fluid therapy that is continued into the postsurgical recovery period will provide the patient with a number of benefits. It will provide patent access should any additional intravenous medication be required. It will also promote provision of circulatory support to maintain oxygen delivery to the tissues and replace any fluid losses or ongoing losses that may have occurred or may be predicted to occur.

According to the literature, animals lose in total 50ml/kg of fluid per 24 hours, through urination, defecation and respiration (Seymour and Gleed, 2005; Hall and Clarke, 1991; Welsh, 2003). This equates to the traditionally quoted maintenance rate of 2ml/kg/hour. These losses indicate that replacement fluids are required to maintain homeostasis. When calculating potential fluid losses, consideration should be given to the length of surgery and any blood loss, and also take into account that the animal may have had its water supply restricted in preparation for the surgical procedure by deeming it “nil by mouth”. This can lead to a shortfall in the fluid capacity of the patient’s body before, during and after surgery.

Any illness that the patient may be systemically affected by may cause an increase in fluid needed to regain homeostasis. Vomiting, diarrhoea, pyrexia or respiratory losses enhanced by tachycardia can increase fluid requirements; even evaporation losses from the surgical site can increase a patient’s fluid replacement requirements.

These factors may indicate that intravenous fluid therapy should be continued during the early recovery stage or until the patient can independently replace these fluid losses. Animals can, to some degree, normally compensate for fluid losses by correcting with homeostatic mechanisms; however, health status, premedication, and anaesthesia can significantly affect this voluntary compensation (Beard and Welsh, 2003).

Intraoperative fluid rates vary dramatically according to the individual patient and the reason for the surgical procedure. Studies quote surgical fluid rates of 5ml/kg/hour, 10ml/kg/hour or 15ml/kg/hour (Seymour and Gleed, 2005; Hall and Clarke, 1991; Welsh, 2003). Decreasing to a maintenance rate of 2ml/ kg/hour may be sufficient during recovery, depending on the factors discussed, and can also include blood pressure values during surgery. If blood pressure values are decreased (indicating hypotension) a higher rate of infusion may be needed or a fluid bolus administered. This may help increase or maintain a patient’s blood pressure in recovery as recovering animals can become lightly anaesthetised again (possibly at stage one), due to the cessation of surgical stimuli. Additional analgesia will make the patient more comfortable and a fall in blood pressure may be seen. This highlights the importance of continued monitoring in recovery, especially if problems such as hypotension have been identified during the anaesthetic.

The choice of fluid type for each patient will take into consideration the patient's physical status, any underlying systemic diseases, age, and may include electrolyte balance values, which can be determined by biochemical analysis prior to surgery (see Table 1).

Administration of fluids

Fluid therapy is commonly delivered intravenously through the peripheral venous entries, such as the lateral saphenous vein, located on the lateral aspect of the hock, the cephalic vein, and the lateral ear vein, which is commonly used in rabbits (Grant, 2006). Common central administration for intravenous fluid therapy includes the medial saphenous, femoral, and jugular vein, normally referred to as a central line. Central lines can be useful if prolonged administration is expected, and can be placed while the patient is anaesthetised to provide longer intervals between replacement of peripheral lines. This offers longer patency than a peripheral line, which is a maximum of three days.

Ensure that asepsis is maintained when placing an intravenous catheter and give some thought to ease of maintenance. If the veterinary surgeon chooses to continue for a longer period with intravenous fluid therapy, maintenance should consist of daily cleaning of the central line and regular heparinisation of the injection port to promote patency and reduce the risk of clot formation. A study by Mathews et al (2005) confirmed that intravenous dwell time need not be restricted to less than 72 hours and can continue without catheter contamination if properly maintained with re-dressings and regular heparinisation.

Other methods of administration of fluid therapy consist of subcutaneous injections, intraperitoneal administration and intraosseous administration. The advantages and disadvantages of each are discussed in Table 2.

As well as using a correctly sized catheter (Table 3) for better patency and improved flow of fluids, a T-connector can provide a separate injection port with an additional connection point for the giving set attachment. This is ideal in patients that require ongoing intravenous medication. Suitable tape should be used to secure it in place. Asepsis should be maintained at all times and the insertion site should be prepared with this as a priority.

An infusion pump can be a useful tool in these patients. It can be electrical or battery operated and offers accuracy in measuring the correct volume to be administered or the volume of fluids already infused. This method of administration also prevents over-infusing or under-infusing the patient. This can be helpful to ensure the nursing staff involved with the care of the patient can easily check that the patient is receiving the correct amount and, in addition, will be informed by an alarm as soon as an administration problem occurs.

Dial-a-flow giving sets can be used as an alternative; however, they do not indicate a loss of patency and the accuracy may be questioned (Seymour and Gleed, 1999). If this equipment is not

available, a simple calculation can be performed to work out how many drops per minute are required for a patient.

During fluid administration, examination of the cardiovascular system, respiratory system and capillaries should be performed regularly to rule out over-infusion. Chest auscultation can be performed regularly to aid the nurse in observing any changes and thus preventing over-infusion.

Nursing care in recovery

The idea of planning nursing care for a patient was first developed in the 1970s. Until this time, patients were admitted, treated, and discharged with little nursing care provided to ensure their comfort during their stay (Aggleton and Chalmers, 2000). Nursing care for a patient undergoing a surgical procedure should aim to aid a quicker, safer recovery.

A form may be devised for the veterinary practice to use during the surgical recovery of patients. Using this for each patient highlights potential problems that could arise and the intervention needed to resolve these problems.

A recovery form is useful in practice and fairly easy to implement. It will ensure all areas of care are being covered and that the plan is tailored to a patient, with the ultimate aim of reducing risk in the recovery period. Areas to cover include continuation of intravenous fluid therapy until the patient is eating adequately, keeping the intravenous catheter patent with regular heparinised saline, and insertion of a feeding tube. This would be ideal in patients that are expected to be inappetent after surgery or patients that are hypotensive during surgery.

Another factor to consider is the patient's recovery position. If the patient had a prolonged surgical procedure in lateral recumbency then recovering the animal in sternal will reduce the risk of hypostatic pneumonia and reduce muscular discomfort. For patients that are expected to be non-ambulatory for a period after surgery – for example, a spinal condition – then placement of an indwelling urinary catheter or manually expressing the bladder (with the veterinary surgeon's permission) should be considered. This would reduce discomfort, stress and urine scalds and keep the patient clean and comfortable on recovery. Also think about analgesia and antibiotic therapy – is more needed and/or requested by the veterinary surgeon? Where this is indicated, record it on the patient's kennel sheet or recovery plan so nurses who will be caring for the patient can easily see when more medication is required or when to assess for pain.

Grooming may also be required – especially in cats – to prevent poor coat condition and matted fur when an Elizabethan collar is used. This will also help reduce stress as cats may not be able to express their normal behaviour and will not be able to keep their own coat clean and tidy. Other factors to take into consideration include gender, age and type of procedure the patient has undergone (Bufalari et al, 2007).

Conclusions

Research into the mortality of animals in the recovery period (Brodbelt, 2006 [see part one, *VN Times* 11.10]) has shown a lack of continuous monitoring. As critical problems are not highlighted, I believe this may be where improvements are needed. Monitoring of a patient's cardiovascular and respiratory systems, along with temperature, should ideally be continued into the recovery period until all the vital parameters have normalised (Lasgasse, 2002). I believe that if this is performed, mortality may decrease in this period.

As well as improved monitoring, every patient should be assessed individually and nursing care should be provided and planned accordingly, taking into account case-specific needs for each patient.

By combining the two interventions, I believe an improvement in postoperative mortalities may be noticed.

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Reviewed by Matthew Gurney, BVSc, CertVA, DipECVAA, MRCVS

(Bodyweight x 50ml/24/60) x giving set factor = drops per minute.

Standard giving sets deliver 15-20 drops per ml.

Paediatric giving sets deliver 60 drops per ml.