

## **NUTRITION FOR THE HOSPITALIZED VETERINARY PATIENT**

Ed Carlson, CVT, VTS (Nutrition)

Director of Veterinary Nursing Education

VetBloom

[ecarlson@vetbloom.com](mailto:ecarlson@vetbloom.com)

### **INTRODUCTION**

Nutrition is vitally important to the hospitalized patient. Unfortunately, the nutritional needs of hospitalized patients are often overlooked. Doctors' orders might not include specific feeding instructions. Patients may be unwilling or unable to eat or may not be consuming adequate calories to meet their energy requirements. Whatever the reason, as patient advocates, veterinary nurses should take a proactive role to ensure that the patients' nutritional needs are met.

Medical intervention to stabilize the critically ill patient before initiating nutritional support, including dehydration and acid-base and electrolyte imbalances, is important to reduce the risk for possible additional complications. Patients in a state of shock, for example, may have reduced perfusion to the gastrointestinal tract, leading to reduced gastrointestinal motility, nutrient absorption, and digestion.

### **WHY IS NUTRITION SO IMPORTANT FOR THE HOSPITALIZED PATIENT?**

Daily nutrients in controlled amounts are crucial to maintaining optimal immune function and normal cellular structure and assist with drug metabolism. Patients not consuming adequate nutrition are prone to lean body mass loss, delayed wound healing, weakness, and organ dysfunction. These patients may also have an increase in acquired infections and bacterial translocation. Bacterial translocation is defined as the passage of viable bacteria from the intestines to extraintestinal sites, such as the mesenteric lymph node complex, liver, spleen, kidney, and bloodstream.

Research has shown that the addition of glutamine, arginine, and omega-3 fatty acids can augment intestinal barrier function and prevent bacterial translocation. Multiple studies have shown that providing early enteral nutritional support can shorten hospital stays.

### **DIETARY CONSIDERATIONS**

Healthy dogs and cats use, and store energy derived from protein, fat, and carbohydrates very effectively. However, in an unhealthy state, reduced gastrointestinal absorptive and digestive enzyme production, as well as insulin resistance, may affect dietary carbohydrate tolerance. This may result in altered glucose control and/or diarrhea. Diets formulated for recovery are more often calorically dense and have lower carbohydrate content.

It is important to provide critical patients with adequate dietary protein that supplies essential amino acids. High dietary protein may be used in place of carbohydrates in critical feline and canine patients who are not able to handle carbohydrates well. High protein may be contraindicated in patients with renal disease and those with comorbidities, such as hepatic disease and encephalopathy with pancreatitis.

Calories provided from fat are equally important in the critical patient. Fat is more calorically dense than protein or carbohydrates; therefore, patients may ingest a smaller volume of food

while still consuming more calories. High-fat content is contraindicated in patients with pancreatitis.

Arginine, an amino acid, is essential to protein synthesis and has an immunopreserving effect on protein malnutrition. Glutamine, also an amino acid, plays a role in protein metabolism, nutrient absorption, and intestinal immune function. Folic acid, thiamin, riboflavin, niacin, pantothenic acid, pyridoxine, and vitamin B12 are required for the metabolism of protein, fat, carbohydrates, and glucose. Patients consuming their resting energy requirement (RER) of a commercial diet should be receiving an adequate amount of these vitamins. However, patients that are not eating should be supplemented with vitamin B complex in crystalloid intravenous fluids or with parenteral nutrition containing vitamin B complex.

## **FEEDING RECOMMENDATIONS**

Enteral feeding is preferred in patients who can tolerate it. Feeding tubes should be considered in patients that are unwilling or unable to eat. Nasogastric feeding tubes are easily placed without anesthesia and are often a good option in critical patients; they allow for trickle feeding or bolus feedings of a liquid diet. Esophagostomy tubes and percutaneous-guided gastrostomy tubes should be considered for patients requiring long-term assisted nutritional support once stable enough for general anesthesia. Force-feeding patients by mouth may cause food aversion and should be avoided.

Obtaining a nutritional history, including how long the patient has been anorexic at home before being admitted to the veterinary hospital, is crucial in critical patients. Feeding tube placement to provide nutritional support for feline and canine patients that have been anorexic for 3 or more days should be considered. Parenteral nutrition should be considered in patients that are unable to tolerate feeding by mouth, such as patients with uncontrolled vomiting.

## **ENERGY REQUIREMENTS**

The RER is the energy requirement for a normal animal, which is not fasted and is at rest under thermo-neutral conditions, such as hospitalized patients. There are several equations used to calculate RER:

$$\text{RER} = 70 \times (\text{body weight in kg})^{3/4} \text{ or}$$

$$\text{RER} = \sqrt[3]{\text{weight in kg} \times \text{weight in kg} \times \text{weight in kg}} \times 70$$

Alternatively, for animals weighing between 3 kg and 25 kg, the following calculation should be used:

$$\text{RER} = (30 \times \text{current body weight in kg}) + 70$$

The general recommendation to begin enteral feeding of anorexic patients is one third of the patient's total RER for the first 12 to 24 hours and, if well tolerated, to gradually increase this amount every 12 hours until full RER is reached. If at any time the patient vomits, discontinue feeding until vomiting has resolved, reduce the volume when feeding is resumed, and increase the volume more slowly. In the past, an illness factor was often added to the RER when feeding hospitalized patients. However, this practice is no longer recommended because excessive nutrition during times of illness may increase the risk for hyperglycemia and other metabolic complications.

## **NASOGASTRIC AND NASOESOPHAGEAL TUBE FEEDING**

Only liquid veterinary diets should be used for feeding through nasogastric and nasoesophageal tubes because of the small diameter of these tubes. Trickle feeding via constant rate infusion is

most often used for hospitalized patients, although these tubes may also be used for bolus feedings and to administer oral liquid medications.

Many liquid diets designed for humans are also available; these diets are typically less expensive than veterinary liquid diets. However, they are nutritionally inadequate for long-term use. These human diets are especially inappropriate for cats because they are too low in protein, taurine, and arginine.

## **PARENTERAL NUTRITION**

Parenteral nutrition (PN) is a nutritionally balanced solution that provides calories and nutrients to patients that cannot tolerate enteral nutrition or should not be fed by mouth. PN provides caloric, protein, and micronutrient requirements and should be administered only via a central venous catheter because of its high osmolality. Partial PN provides only part of a patient's caloric, protein, and nutrient requirements. However, it has a lower osmolality and therefore may be administered via peripheral intravenous catheters. Complications associated with PN include hyperglycemia, hyperlipidemia, the potential risk for infection, intestinal atrophy (with subsequent risk for bacterial translocation), increased rate of sepsis, and azotemia. Aseptic technique is required, and extreme care should be taken with the handling and administration of PN. If contaminated, PN can become an excellent growth medium for bacteria. A study by Jensen and Chan showed that patients receiving PN that were also trickle-fed had a higher survival rate than those receiving PN only. If PN is used, the general recommendation is to begin trickle feeding as soon as the patient will tolerate it and gradually increase enteral feeding.

## **NURSING CARE**

An important role of the veterinary nurse is to closely monitor hospitalized patients. Identifying potential problems and alerting the veterinarian allows for the patient treatment plan to be adjusted, potentially improving patient outcome. In addition to the standard monitoring of vital signs, vomiting, and diarrhea, hospitalized patients should be monitored for signs of refeeding syndrome, food aversions, fluid overload, electrolyte imbalances, feeding tube malfunction, and infection of feeding tube insertion sites.

Experienced veterinary technicians and veterinary nurses generally use a variety of coaxing techniques to encourage their patients to eat. Warming canned food, for example, may work for some patients, while chilled canned food may be better accepted by nauseous patients. Hand feeding, petting, and talking to the patient in a soothing manner during feeding time may work with some patients, while others may prefer to eat when left alone and undisturbed.

Good record keeping is essential to determine whether the patient is consuming adequate calories or whether assisted feeding should be initiated, continued, or discontinued. Nursing notes should include the specific food offered, the volume of food offered, the approximate volume of food consumed, and calories consumed.

Veterinary nurses should also understand diet options recommended for various diseases and work closely with veterinarians to provide hospitalized patients with the best nutrition options.

## **CONCLUSION**

The goal of feeding the critical patient is to prevent or minimize malnutrition, prevent nutrient deficiencies, and provide nutrients to promote healing. Veterinary nurses and the entire veterinary health care team play an essential role in providing nutritional support that may improve patient outcome.

**REFERENCES** – available upon request.