Nutritional Support for the Critical Patient

Abstract

This full length lecture takes a detailed look at the role of nutrition in emergency and critical patients and looks at the different options available for providing nutritional support for these patients. It discusses when to consider tube feeding, nutritional assessment of patients, and the actual placement of tubes. It also discuss diet choice and calculating how much to feed.

Learning Outcomes

- An understanding of the role of nutrition in emergency and critical patients and the importance of nutrition to recovery.
- Knowledge of the different nutritional support options available.
- Knowledge of the placement of different feeding tubes
- An understanding of different diet choices available and how to calculate amounts to feed.

Course Notes

Feeding Tubes: The Role of Nutrition in Emergency & Critical Patients

- Nutrition is obviously a very important part of patient care!
- Often overlooked, or dealt with too late. We should be anticipating problems, not reacting to them
- Malnourished patients are at risk of increased mortality......
- Anticipate the need for intervention, and speed the recovery and improve outcome.

Enteral Nutritional Support:

- TPN remains controversial in animals, may have risks.
- Broadly speaking: *if the gut is working, use it! And use as much of it as possible!*
- Intestinal mucosa needs glutamine and regular nutrients to maintain itself.
- Anorexic animals:
  - Coaxing/hand feeding
  - Chemical stimulation of appetite?
  - May remind animal what it is missing and kick start feeding?
  - But short term options only......
INDICATIONS:

- ANOREXIA - Partial or total, > 5 days.
- ANTICIPATED ANOREXIA - eg. Post surgical.
- WEIGHT LOSS - Significant loss >10%.
- INCREASED LOSSES - eg. protein loss through burns.
- INCREASED REQUIREMENTS - eg. sepsis, extensive healing wounds.
- BYPASS SPECIFIC AREAS G.I.T. - Mouth, oesophagus, stomach, pancreas.

Current emphasis on critical care nutrition

- More effective methods of nutritional support
- Not simply offering foods
- Emphasis on adequate intake
- Tube feeding
- Parenteral nutrition
- Minimising complications

Nutritional assessment

- Which patients are already malnourished?
- Which patients are at high risk?
- Which patients are at low risk?

- Systematic evaluation
- Takes into account historical, clinical data
- Risk factors for malnutrition
- Risk factors for complications associated with feeding
- Allows proper formulation and execution of nutritional plan

Malnutrition

- What are indicators of malnutrition in small animals?
- Weight loss?
- Muscle wasting?
• Low serum albumin?
• Poor coat quality?
• Poor wound healing?
• All nonspecific, and late indicators of malnutrition

When to intervene?
• How long can you wait before intervening?
• How many days??
• When do you start counting?
• *Depends, but no animal should go more than 5 days without food*
• *Start counting when the animal stopped eating at home*

Nutritional intervention
• First things first…
• Must address fluid and acid/base status
• Must address electrolytes imbalances
• Patients should be cardiovascularly stable before nutritional interventions
• You DON’T need a diagnosis before starting nutrition!!

Enteral Nutrition:
• Oral feeding:
  Assisted oral feeding
  Coax feeding
  “Force-feeding” or “Syringe-feeding”
  Potential for “food aversion”
  Risk for aspiration into airways in certain patients

• Tube feeding:
  Nasoesophageal
  Nasogastric
  Pharyngostomy (No longer used)
Oesophagostomy  
Gastrostomy  
Jejunostomy

**Deciding what tube to use**
- Anticipated duration of supplementation
- Diet choice
- Comfort level (veterinary surgeon, nursing staff and client)
- Potential benefits
- Potential risks

**How much to feed?**
- How much should critically ill animals be fed?
- More than normal?
- Less than normal?
- Normal amounts?
  - Depends on the case, but usually slightly less than normal
  - A good starting point is to calculate the minimal amount of calories needed by the animal
    - Resting Energy Requirements (RER)
    - \[ \text{RER} = \text{calories per day} \]
      
      - Smaller patients, below 2kg: \[ \text{RER} = 70 \times (\text{weight in kg})^{0.75} \]
      - Patients over 2kg: \[ \text{RER} = 30 \times (\text{weight in kg}) + 70 \]
      - Weigh patients daily.

**Potential complications of enteral feeding**
- Clogged tube
- Cellulitis
- Vomiting
- Diarrhoea
- Fluid overload
• Electrolyte changes
• Peritonitis
• Refeeding Syndrome

Nursing the Feeding Tube Patient.

Care of tube and patient:

• Check and clean stoma, replace sterile dressing daily initially.
• Do not feed for first 24hrs to allow seal/adhesions to start forming.
• Gastrostomy tubes - always aspirate prior to feeding. Is previous meal still present??
• Always flush the tube with water prior to feeding - observe for any cough, retch etc.
• Always flush tube with water after feeding - try to keep a ‘column’ of water in tube between feeds.

Feeding:

• Warm food to body temperature. Watch for any discomfort, retching etc.
• Small bore tubes - use only commercial liquid diets.
• Slow introduction of diet, 3 days to reach daily target. If fed straight away, vomiting, diarrhoea, nausea.
• Day 1, one third of requirement diluted with water. Day 2, two thirds. Day 3 full concentration.
• Frequency /volume of feeds dictated by tube position. Gastrostomy tube least frequent. Naso-oesophageal and jejunostomy most frequent.

Discontinue tube feeding

When pet is eating well for > 5-7 days
• When underlying disease has reversed
• Don’t remove too early!

Summary

• Provision of nutrition to critically ill/traumatise animals is challenging
• Emphasis is on adequate intake – without appetite stimulants
• Greater consideration for feeding tubes – especially oesophagostomy tubes
• Avoid overfeeding, watch out for complications.
**Naso-oesophageal tubes**

- Tube placed from the nose to either the caudal oesophagus or the stomach
- Small bore - liquid diet only
- 3.5-5 Fr cats
- 5-8 Fr dogs
  - Easy to place
  - No general anaesthesia
  - Ideal for very critical patients
  - Diet (relatively) expensive, liquid diets only
  - Irritating to some patients

**Oesophagostomy tubes**

- Probably the most important and versatile feeding tube for small animals
- Safe and effective
- Comfortable for owner and animal
- Easy to place
- Brief general anaesthesia
- Very well-tolerated
- Blenderised foods, instant liquid diets

**Gastrostomy Tubes.**

- Advantages:
  - Large bore tube.
  - Easy to maintain.
  - Can use for months.
  - Useful in long term management of critical and recovering patients.

- Disadvantages:
  - GA required.
  - Some specialised equipment.
  - Risk of peritonitis.
  - MUST stay in place 10-14 days.
Enterostomy Tubes

- Advantages:
  - Distal to stomach, pancreas and biliary tract.
  - Well tolerated

- Disadvantages:
  - Cost, longer GA.
  - Peritonitis risk.
  - Narrow tube.
  - Remain in place for 14 days.

Usually placed into jejunum- hence jejunostomy tube. Used most frequently where bypass of stomach, pancreas etc required.