

# Management of Chronic Renal Insufficiency

*A PowerPage Presented By*



Chronic renal insufficiency (CRI) is a very common medical disorder of geriatric cats and dogs. Diagnosis is typically made easily once significant renal function has been lost to cause isosthenuria and azotemia. In this PowerPage, the text briefly highlights the major clinical signs associated with CRI and key features about intervention.

## Key Points

- Adequate therapy for patients with CRI requires monitoring and intervention with appropriate dietary and medical management to address the clinical manifestations of the disease and slow down disease progression

## Clinical Abnormalities Seen with CRI

### Dehydration

- Polyuria occurs with renal insufficiency. This can result in renal hypoperfusion and prerenal azotemia which can worsen the patient's renal function and clinical status
- Increasing oral water consumption by providing plentiful fresh water sources is optimal
  - Owners can often increase water consumption by feeding canned food
  - This is often supplemented with administration of a saline or lactated ringer's solution

### Metabolic Acidosis

- Therapy for acidosis is usually not necessary, but patients may be given potassium citrate as an oral alkalinizing agent
- Sodium bicarbonate administration should be reserved for patients with significant acidosis ( $\text{HCO}_3^- < 17 \text{ meq/l}$ )

### Hypokalemia

- Oral supplementation of potassium is frequently indicated

### Uremia

- Inability to excrete metabolic byproducts leads to buildup of urea and other uremic toxins in the bloodstream
- This contributes to CNS depression, anorexia, nausea, vomiting, halitosis, gastritis, and other clinical signs
- Treated with diet (see below) and fluid diuresis

### Anorexia

- May occur due to uremic ulcers and gastritis, dehydration, metabolic acidosis, and hypokalemia
  - Addressing those problems with the measures above is important
  - H<sub>2</sub>-blocking drugs such as famotidine (Pepcid) are frequently used

### Calcium/Phosphorus Imbalance

- Increased phosphate levels can lead to excessive PTH secretion, renal osteodystrophy, extraskeletal mineralization, and further progression of renal dysfunction

- Limiting dietary phosphorus intake and/or administering phosphate binding agents (aluminum hydroxide, aluminum carbonate) can be important in management of CRI
- Calcitriol therapy is recommended by some internists to reduce PTH levels and improve therapeutic outcome

### Anemia

- This is very common in CRI and is likely multifactorial
- Inadequate renal erythropoietin production is a major factor
- Recombinant human erythropoietin administration may be indicated with significant anemia that is compromising quality of life or necessitating transfusion

### Hypertension

- Common with CRI and may promote proteinuria
- Managed with ACE inhibitors and other antihypertensives

## Treatment of CRI

### Dietary Therapy

- Dietary therapy for CRI is of paramount importance as it addresses many of the items above
- An appropriate diet for a patient with CRI should:
  - Minimize uremia (**low protein**) and corresponding clinical signs
  - Minimize fluid, electrolyte, and mineral deficits (**high moisture content**)
  - Minimize acidosis
  - Promote general nutrition (**palatable and with sufficient caloric density**)
  - Slow progression of renal disease (**reduced phosphorus**)
- Dietary therapy has been shown to prolong life by 2-3 times in dogs and cats with renal insufficiency

### Fluid Therapy

- Increasing oral water consumption by providing plentiful fresh water sources is optimal
  - This is often supplemented with administration of a saline or lactated ringer's solution

### Additional Therapies (As mentioned above)

- Phosphate binding agents (aluminum hydroxide, aluminum carbonate)
- Oral supplementation of potassium is frequently indicated
- ACE inhibitors and other antihypertensives
- H<sub>2</sub>-blocking drugs such as famotidine (Pepcid)
- Calcitriol therapy is recommended by some internists to reduce PTH levels and improve therapeutic outcome
- Recombinant human erythropoietin administration may be indicated with significant anemia that is compromising quality of life or necessitating transfusion

## References and Links

### VIN Conference Proceedings Links:

<http://www.vin.com/Members/Proceedings/Proceedings.plx?CID=wvc2004&PID=pr05542&O=VIN>

<http://www.vin.com/Members/Proceedings/Proceedings.plx?CID=wvc2003&PID=pr03537&O=VIN>

<http://www.vin.com/Members/Proceedings/Proceedings.plx?CID=acvc2008&PID=pr25822&O=VIN>

<http://www.vin.com/Members/Proceedings/Proceedings.plx?CID=wrlidvc2008&PID=pr23616&O=VIN>

