

# Diagnosing, Staging, and Treating Chronic Kidney Disease in Dog and Cats

Chronic kidney disease (CKD) is diagnosed based on evaluation of all available clinical and diagnostic information in a stable patient. The IRIS Board continues to recommend using creatinine, a widely available and well understood test, to diagnose and stage CKD. Symmetric dimethylarginine (SDMA), a new marker of kidney function, may be a useful adjunct for both diagnosis and staging of CKD.



# Step 1: Diagnose CKD

**Clinical signs and physical examination findings worsen with increasing severity of kidney disease**

## Clinical presentation

Consider age, sex, breed predispositions, and relevant historical information, including medication history, toxin exposure, and diet.

Can be asymptomatic in early CKD. Signs may include polyuria, polydipsia, weight loss, decreased appetite, lethargy, dehydration, vomiting, and bad breath.

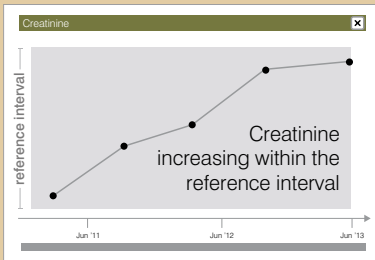
## Physical examination findings

Can be normal in early CKD. Findings may include palpable kidney abnormalities, evidence of weight loss, dehydration, pale mucous membranes, uremic ulcers, evidence of hypertension, i.e., retinal hemorrhages/detachment.

## To diagnose early CKD

One or more of these diagnostic findings

1

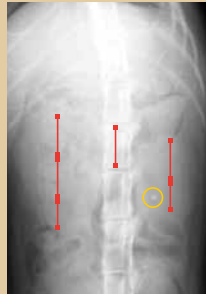


2

Persistent increased  SDMA >14  $\mu\text{g}/\text{dL}$

3

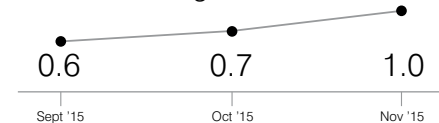
Abnormal kidney imaging



4

Persistent renal proteinuria

UPC >0.5 in dogs; UPC >0.4 in cats



Urine protein to creatinine (UPC) ratio

OR

## To diagnose more advanced CKD

Both of these diagnostic findings

Increased creatinine and SDMA concentrations

Creatinine

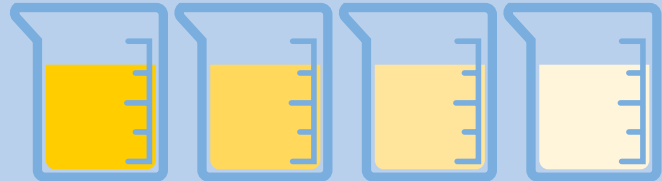
SDMA

plus

Results of both tests should be interpreted in light of patient's hydration status.

Urine specific gravity <1.030

Urine specific gravity <1.035



1.030

Canine

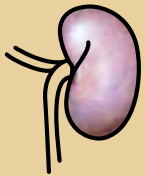
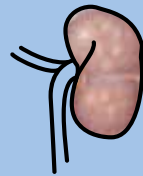

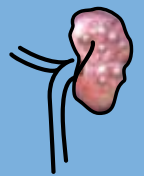

1.008

1.035

Feline

1.008

# Step 2: Stage CKD

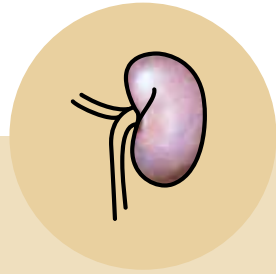
		 Stage 1 No azotemia	 Stage 2 Mild	 Stage 3 Moderate	 Stage 4 Severe
<b>Creatinine</b> in $\mu\text{mol/L}$  Stage based on stable creatinine	Canine	<125	125 - 180	181 - 440	>440
	Feline	<140	140 - 250	251 - 440	>440
 <b>SDMA</b> in $\mu\text{g/dL}$		>14	>14	Moderately increased	Markedly increased
			$\geq 25$		
				$\geq 45$	
<b>UPC ratio</b>  Substage based on proteinuria	Canine	Nonproteinuric <0.2	Borderline proteinuric 0.2 - 0.5	Proteinuric >0.5	
	Feline	Nonproteinuric <0.2	Borderline proteinuric 0.2 - 0.4	Proteinuric >0.4	
<b>Systolic blood pressure</b> in mm Hg  Substage based on blood pressure		Normotensive <150	Borderline hypertensive 150 - 159		
			Hypertensive >160	Severely hypertensive $\geq 180$	

  
 Consider understaged based on creatinine



 SDMA = IDEXX SDMA™ Test  
 See [iris-kidney.com](http://iris-kidney.com) for more detailed staging, therapeutic, and management guidelines.

# Step 3: Treat CKD



## Stage 1

No azotemia

Investigate for and treat underlying disease

Treat hypertension if systolic blood pressure persistently > 160 mmHg or evidence of end-organ damage

Treat persistent proteinuria with therapeutic diet and medication

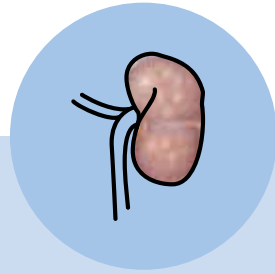
UPC >0.5 in dogs;  
UPC >0.4 in cats

Keep phosphorus < 1.50 mmol/L  
If required, use kidney therapeutic diet +/- phosphate binder

Use with caution potentially nephrotoxic drugs

Correct prerenal and postrenal abnormalities

Fresh water available at all times



## Stage 2


Mild

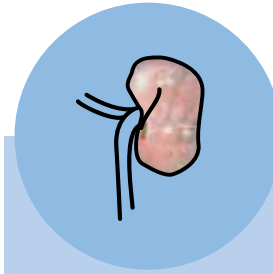
Same as Stage 1

Kidney therapeutic diet

Treat hypokalemia in cats

Treat metabolic acidosis

If  SDMA ≥ 25, consider treatment for Stage 3



## Stage 3

Moderate

Same as Stage 2


Keep phosphorus < 1.60 mmol/L

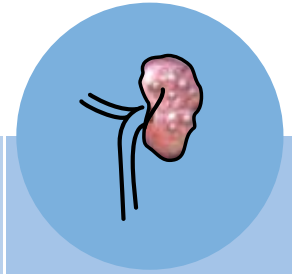
Treat anemia (PCV <25% in dogs; PCV <20% in cats)

Treat vomiting / inappetence / nausea

Consider subcutaneous and/or enteral fluids to maintain hydration

Consider calcitriol therapy in dogs

If  SDMA ≥ 45, consider treatment for Stage 4



## Stage 4

Severe

Same as Stage 3

Keep phosphorus < 1.90 mmol/L

Consider feeding tube for nutritional and hydration support and for ease of medicating

### Treatment recommendation

Consider treatment of next stage. Creatinine may underestimate degree of kidney dysfunction in patients with poor muscle mass

**IRiS**

International Renal Interest Society

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