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. Persistent increased SDMA >14 µg/dL
2. Abnormal kidney imaging
3. Increased creatinine and SDMA concentrations

To diagnose more advanced CKD

Both of these diagnostic findings

1. Increased creatinine and SDMA concentrations
   - Creatinine
   - SDMA

2. Urine specific gravity
   - Canine <1.030
   - Feline <1.035

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

<table>
<thead>
<tr>
<th>Creatinine</th>
<th>SDMA</th>
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<table>
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<tr>
<th>Urine specific gravity</th>
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<tbody>
<tr>
<td>Canine 1.008</td>
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<tr>
<td>Feline 1.008</td>
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</table>

1. Urine protein to creatinine (UPC) ratio

0.6 0.7 1.0

Sept '15  Oct '15  Nov '15

Urine protein to creatinine (UPC) ratio
## Step 2: Stage CKD

**Creatinine in mg/dL**
- **Canine**
  - Stage 1: <1.4
  - Stage 2: 1.4–2.0
  - Stage 3: 2.1–5.0
  - Stage 4: >5.0
- **Feline**
  - Stage 1: <1.6
  - Stage 2: 1.6–2.8
  - Stage 3: 2.9–5.0
  - Stage 4: >5.0

**SDMA in µg/dL**
- Stage 1: >14
- Stage 2: >14
- Stage 3: Moderately increased
- Stage 4: Markedly increased

**UPC ratio**
- **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

**Systolic blood pressure in mm Hg**
- Normotensive: <150
- Borderline hypertensive: 150–159
- Hypertensive: 160–179
- Severely hypertensive: ≥180

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**SDMA = IDEXX SDMA™ Test**

See 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 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 <4.6 mg/dL
- 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 <5.0 mg/dL
- 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 <6.0 mg/dL
- Consider feeding tube for nutritional and hydration support and for ease of medicating

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

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