An elevated SDMA* concentration is a reflection of impaired glomerular filtration rate (GFR). Both primary kidney disease and secondary kidney insults, such as concurrent disease, can cause an elevation in SDMA concentration. Follow this algorithm to investigate elevated SDMA concentrations and determine whether acute, active, or chronic injury is occurring and how to begin to investigate, manage, and monitor disease.

**IDEXX SDMA algorithm**

An elevated SDMA concentration is a reflection of impaired glomerular filtration rate (GFR). Both primary kidney disease and secondary kidney insults, such as concurrent disease, can cause an elevation in SDMA concentration. Follow this algorithm to investigate elevated SDMA concentrations and determine whether acute, active, or chronic injury is occurring and how to begin to investigate, manage, and monitor disease.

**IDEXX SDMA**

14

ELEVATED

Note: Puppy reference interval 0–16 µg/dL

- **15–19 µg/dL**
  - Evaluate complete urinalysis

- **≥20 µg/dL**
  - Evaluate complete urinalysis

**Other evidence of decreased GFR or kidney disease?**

- Inappropriate urine specific gravity
- Active urine sediment
- Proteinuria (inactive sediment)
- Elevated BUN, creatinine, or phosphorus
- Creatinine increasing within the reference interval
- Polyuria/polydipsia (PU/PD)
- Anorexia or weight loss
- Abnormal kidney palpation or imaging
- Hypertension

**Persistent elevation in SDMA concentration**

- No
  - Recheck kidney panel in 2–4 weeks (minimum of SDMA, BUN, creatinine, phosphorus, urinalysis)
  - No
  - Evaluate patient in 6 months

- Yes
  - Impaired GFR: ACT NOW

**Evaluated complete urinalysis**

- **15–19 µg/dL**
  - No
  - Polyuria/polydipsia (PU/PD)
  - Anorexia or weight loss
  - Abnormal kidney palpation or imaging
  - Hypertension

- **≥20 µg/dL**
  - Yes
  - Elevated BUN, creatinine, or phosphorus
  - Creatinine increasing within the reference interval
  - Inappropriate urine specific gravity
  - Active urine sediment
  - Proteinuria (inactive sediment)

**Detects diseases of the kidney sooner**

Examples:
- Chronic kidney disease (CKD)—see International Renal Interest Society (IRIS) guidelines
- Acute kidney injury
- Pyelonephritis

**Reflects other disease processes affecting the kidneys**

Examples:
- Hypertension
- Severe dehydration
- Toxicity (e.g., NSAIDs, ethylene glycol, lilies)
- Hyperthyroidism (feline)

See reverse for the initial steps in investigating, managing, and monitoring impaired GFR as identified by an elevated SDMA

IDEXX SDMA ELEVATED

14

Evaluate complete urinalysis

15–19 µg/dL

≥20 µg/dL

Impaired GFR: ACT NOW

Evaluate patient in 6 months

Persistent elevation in SDMA concentration

No

Yes

Recheck kidney panel in 2–4 weeks (minimum of SDMA, BUN, creatinine, phosphorus, urinalysis)

Evaluate complete urinalysis

Detects diseases of the kidney sooner

Reflects other disease processes affecting the kidneys

Examples:
- Chronic kidney disease (CKD)—see International Renal Interest Society (IRIS) guidelines
- Acute kidney injury
- Pyelonephritis

Examples:
- Hypertension
- Severe dehydration
- Toxicity (e.g., NSAIDs, ethylene glycol, lilies)
- Hyperthyroidism (feline)
Initial steps in investigating, managing, and monitoring impaired GFR as identified by an elevated SDMA

<table>
<thead>
<tr>
<th>Investigate</th>
<th>Manage</th>
<th>Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Underlying cause</strong></td>
<td><strong>Treat appropriately</strong></td>
<td><strong>Monitor renal biomarkers</strong></td>
</tr>
<tr>
<td>Urinary tract infection (UTI)/pyelonephritis</td>
<td>Underlying disease (e.g., pyelonephritis, infectious disease)</td>
<td>Tended testing of the following:</td>
</tr>
<tr>
<td>Toxicity (e.g., NSAIDs, ethylene glycol, lilies)</td>
<td>Dehydration</td>
<td>SDMA, BUN, creatinine, and phosphorus</td>
</tr>
<tr>
<td>Acute kidney Injury</td>
<td>Discontinue nephrotoxic medications (e.g., NSAIDs)</td>
<td>Urinalysis</td>
</tr>
<tr>
<td>Systemic hypertension</td>
<td>Hypertension</td>
<td>Blood pressure</td>
</tr>
<tr>
<td>Chronic kidney disease (CKD)</td>
<td>Proteinuria</td>
<td></td>
</tr>
<tr>
<td><strong>Consider performing</strong></td>
<td><strong>Additional support</strong></td>
<td><strong>Outcome</strong></td>
</tr>
<tr>
<td>Urine culture and minimum inhibitory concentration (MIC) susceptibility</td>
<td>Ample, clean water</td>
<td>GFR impairment, stable</td>
</tr>
<tr>
<td>Infectious disease testing</td>
<td>Kidney-supportive diet if warranted</td>
<td>SDMA remains increased, but stable</td>
</tr>
<tr>
<td>Abdominal imaging</td>
<td></td>
<td>GFR remains impaired but stable</td>
</tr>
<tr>
<td>Urine protein:creatinine (UPC) ratio (proteinuria)</td>
<td></td>
<td>Consider CKD diagnosis, refer to IRIS staging and treatment guidelines</td>
</tr>
<tr>
<td>Blood pressure</td>
<td><strong>Adjust anesthesia protocols</strong></td>
<td>Institute appropriate supportive care and monitoring</td>
</tr>
<tr>
<td><strong>Concurrent condition to assess</strong></td>
<td>Provide fluids (intravenous or subcutaneous)</td>
<td><strong>SDMA continues to increase</strong></td>
</tr>
<tr>
<td>Hydration status</td>
<td>Oxygen support prior to, during, and after procedure</td>
<td>Ongoing active kidney injury</td>
</tr>
<tr>
<td>Thyroid status (feline)</td>
<td>Adjust pain management</td>
<td>Revisit investigate: repeat or perform additional diagnostics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Institute ongoing supportive care</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>SDMA returns to normal</strong></td>
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<tr>
<td></td>
<td></td>
<td>Recovery from mild injury</td>
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<tr>
<td></td>
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<td>Response to appropriate therapy</td>
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<td></td>
<td></td>
<td>Compensatory mechanisms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recheck within 6 months–1 year</td>
</tr>
</tbody>
</table>

Remember that patients can move back to an investigation stage from management or monitoring depending on progression or change in renal status.