For veterinary use only

Clinical Guidelines

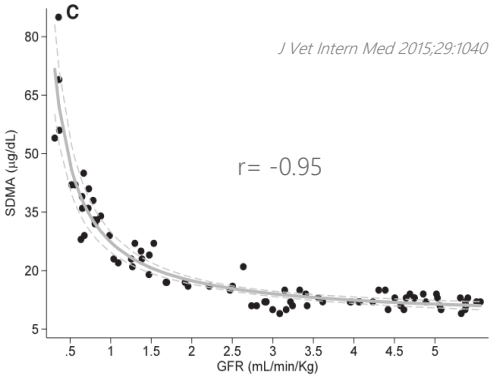
Vcheck SDMA

BIONOTE

Vcheck SDMA

What is SDMA?

- Symmetric dimethylarginine (SDMA) is a new kidney biomarker that accurately reflects glomerular filtration rate (GFR) ⇒ Its concentrations are inversely proportional to GFR.
- This marker permits **earlier diagnosis of kidney disease than traditional creatinine testing**.



Why is SDMA biomarker important?

① **SDMA level increases earlier than creatinine ('Early diagnosis')**

- ✓ SDMA level increases earlier in chronic kidney disease (CKD), **on average a 40% reduction in their GFR**, compared with up to 75% reduction needed to increase creatinine level.
- ✓ Increases 17 months (Cats), 9.8 months (Dogs) on average, earlier than creatinine

➢ Earlier diagnosis and treatment may slow the rate of progression of CKD, increase the pet's life span and help to better manage CKD.

② **Not influenced by extrarenal factors**

- ✓ **BUN**: Affected by diet, gastrointestinal bleeding, hepatic diseases, increased metabolism
- ✓ **Creatinine**: Affected by muscle mass and diet - such as ingestion of meat
- ✓ SDMA
  - Not influenced by breed, gender or age
  - Not significantly increased after vigorous exercise
  - Not influenced by total lean body mass (more reliable indicator in hyperthyroid cats)

Clinical Applications

- Regular health check
- Pre-anesthetic examination
- Staging of CKD
- Monitoring of patients with kidney disease

Vcheck SDMA

Chronic kidney disease (CKD)

- **31% of cats older than 10 years to be affected**
  (one of the most common diseases in older cats)
- **Annual screening of healthy cats**: from 5-6 years of age

Clinical signs

(with progression of CKD)

- Polyuria and polydipsia
- Decreased appetite
- Weight loss & Lethargy
- Vomiting

CKD Screening Tests

Components of CKD screening include a physical examination, blood testing, and urinalysis.

- Physical examination - Body and muscle condition scoring (BCS, MCS)
  - **Gradual weight loss and muscle wasting**: signs of early disease
  - Weight loss in cats can occur 1 to 3 years before kidney disease is diagnosed.
- Blood testing
  - **CBC**: anemia
  - **Serum chemistry (BUN, Creatinine, etc.)**: azotemia, hyperphosphatemia
  - **Electrolytes**
  - **SDMA** (earlier detection of renal disease)
- Urinalysis
  - **Urine Specific Gravity (USG)**: below 1.035 (cats), below 1.030 (dogs)
    (+ Additional diagnostics needed, including blood pressure and SDMA measurements.)
  - **Urine protein : creatinine ratio (UPC)**: proteinuria⇒ >0.4 (cats), >0.5 (dogs)

By **Valerie J. Parker** DVM, DACVIM, DACVN

Attention Points of SDMA!

SDMA testing can be a complementary tool for CKD diagnosis.

✓ **A single abnormal result does not confirm CKD**

- CKD diagnosis should not be on the basis of 1 elevated creatinine or SDMA value without determining if the results are repeatable.
- For a confirmed diagnosis of CKD, abnormal findings should persist for at least 3 months.
- If the SDMA concentration is the only finding suggestive of CKD, you should re-test within 1 to 3 months to confirm repeatability.

✓ **Not a substitute for urinalysis and other diagnostic procedures**

- SDMA findings should always be viewed within the context of the entire clinical picture.

Vcheck SDMA

IRIS Staging of CKD (modified 2019)

- CKD staging is undertaken following diagnosis of chronic kidney disease (CKD) in order to facilitate appropriate treatment and monitoring of the canine or feline patient.
- **SDMA or Creatinine concentration should be tested on at least two occasions in a hydrated, stable patient.**
  - Fasting blood SDMA concentration
  - Fasting blood Creatinine concentration
  - Both (Recommended)

IRIS Staging of CKD (2019)	Stage 1 No renal azotemia		Stage 2 Mild		Stage 3 Moderate		Stage 4 Severe	
	Canine	Feline	Canine	Feline	Canine	Feline	Canine	Feline
Creatinine mg/dL (µmol/L)	< 1.4 (< 125)	< 1.6 (< 140)	1.4 – 2.8 (125 – 250)	1.6 - 2.8 (140 – 250)	2.9 – 5.0 (251 – 440)	2.9 – 5.0 (251 – 440)	> 5.0 (> 440)	> 5.0 (> 440)
Vcheck SDMA µg/dL	< 18	< 18	18 – 35	18 – 25	36 – 54	26 – 38	> 54	> 38
Comments	▪ If SDMA is persistently >18 µg/dl, this patient should be staged and treated as an IRIS CKD Stage 2 patient. ▪ Persistently elevated blood SDMA concentration (>14 µg/dl) may be used to diagnose early CKD.		▪ If SDMA is persistently >35 µg/dl in a dog (>25 µg/dl in a cat), this patient should be staged and treated as an IRIS CKD Stage 3 patient. ▪ Clinical signs usually mild or absent.		▪ If SDMA is persistently >54 µg/dl in a dog (>38 µg/dl in a cat), this patient should be staged and treated as an IRIS CKD Stage 4 patient. ▪ No signs ⇒ Early Stage 3 ▪ Presence of systemic signs ⇒ Late Stage 3		▪ Increasing risk of systemic clinical signs and uremic crises	

Table 1. CKD Staging based on Creatinine or SDMA concentrations

References

1. Roberta Relford, Jane Robertson, Celeste Clements.: Symmetric Dimethylarginine, Improving the Diagnosis and Staging of Chronic Kidney Disease in Small Animals. Vet Clin Small Anim 46 (2016) 941–960.
2. International Renal Interest Society guidelines. 2019. Available at: http://www.iris-kidney.com/pdf/IRIS_Staging_of_CKD_modified_2019.pdf
3. Nabity NB, Lees GE, Boggess MM, et al. Symmetric dimethylarginine assay validation, stability, and evaluation as a marker for the detection of chronic kidney disease in dogs. J Vet Intern Med 2015;29:1040.
4. Valerie J. Parker, DVM, DACVIM, DACVN.: Chronic Kidney Disease Screening and Confirmation Testing in Cats
5. Freeman LM, Lachaud MP, Matthews S, et al. Evaluation of weight loss over time in cats with chronic kidney disease. J Vet Intern Med 2016;30(5):1661-1666

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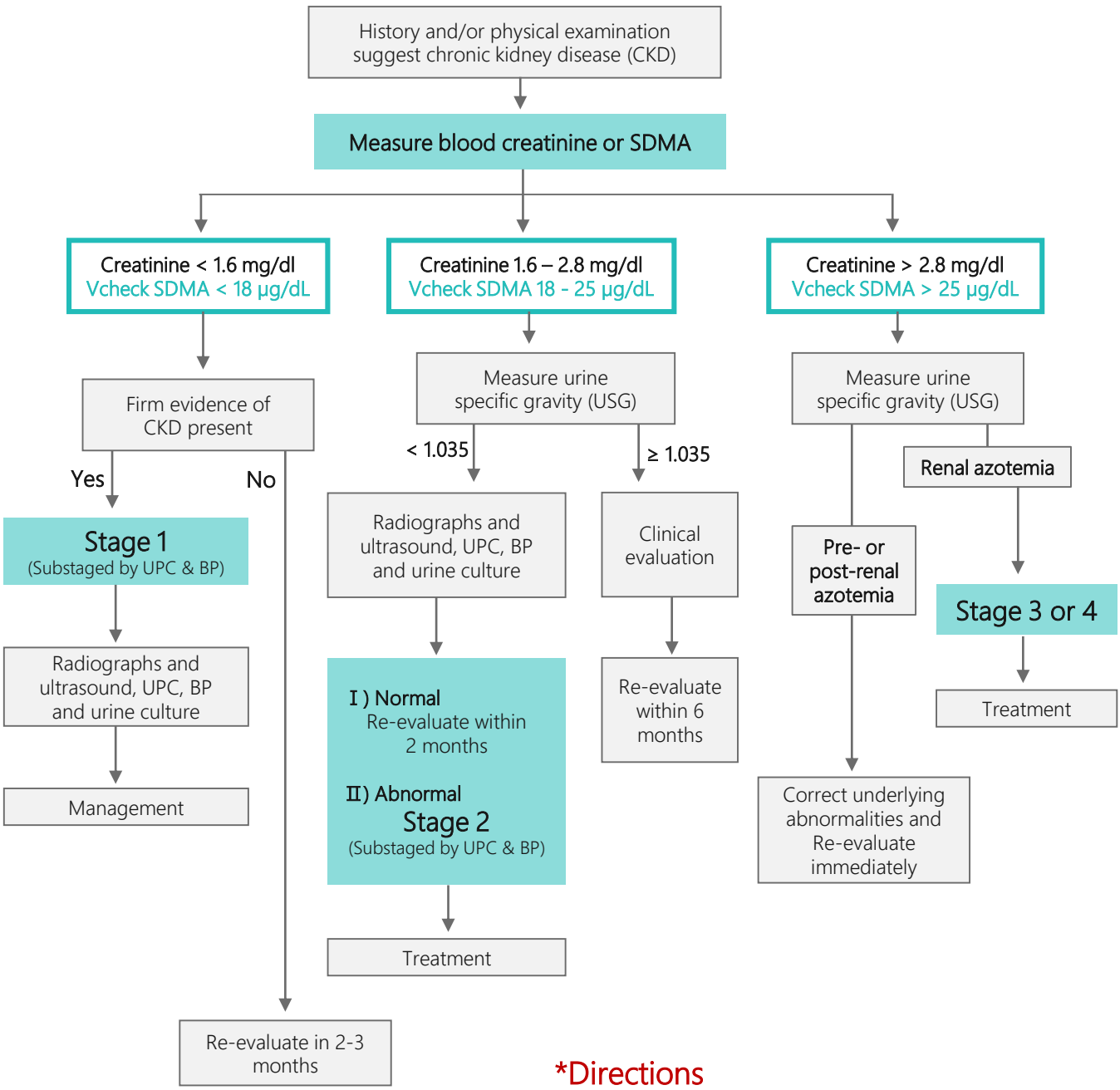
Appendix ①

Algorithm for Staging of Chronic Kidney Disease in Cats

By IRIS (International Renal Interest Society) guidelines



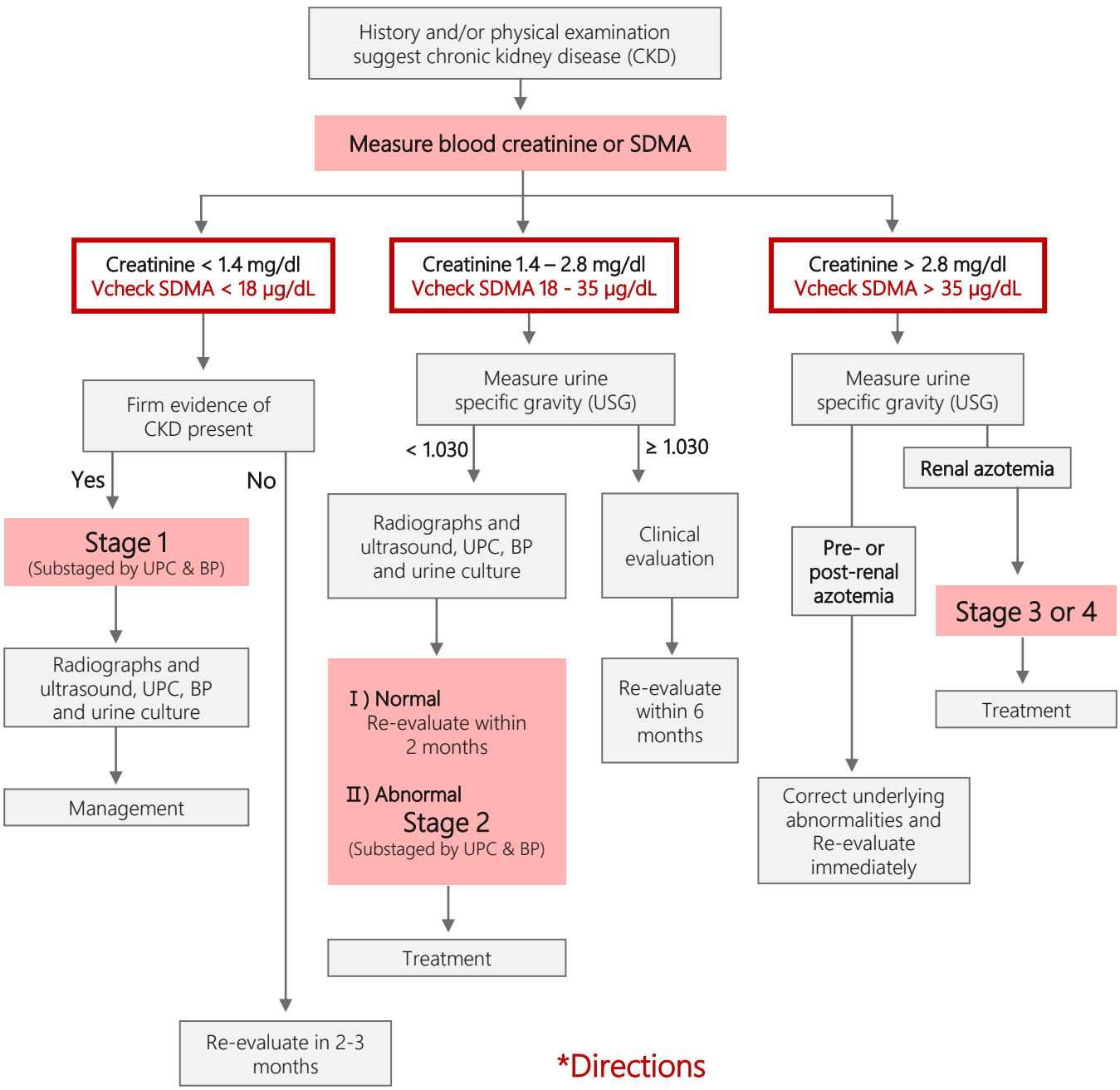
***Directions**

Creatinine or SDMA should be measured at least two occasions in a hydrated, stable patient.

Appendix ②

Algorithm for Staging of Chronic Kidney Disease in Dogs

By IRIS (International Renal Interest Society) guidelines



*Directions

Creatinine or SDMA should be measured at least two occasions in a hydrated, stable patient.