

# An SDMA case study: Jimmy



**Patient:** Jimmy, 13-year-old, neutered male domestic shorthair

**Presenting reason:** Jimmy was brought in for his annual checkup and vaccines.

**History:** He was an indoor/outdoor cat, and his owner reported that Jimmy seemed to be doing fine and that there were no current concerns.

**Physical examination:** Jimmy was bright, alert, and responsive (BAR). Normal temperature, pulse, and respiration rate were observed. He had good muscle mass and a good body condition score. Remainder of physical examination unremarkable, except for some moderate periodontal disease.

## Chemistry

	8/13/15 (Order Received) 8/13/15 7:49 AM (Last Updated)		IDEXX Reference Laboratories <a href="#">Show Details</a>
Glucose	4.8	3.2 - 7.5 mmol/L	
Urea	10.0	5.0 - 15.0 mmol/L	
Creatinine	0.19	0.08 - 0.20 mmol/L	
<b>IDEXX SDMA</b> <a href="#">Learn More</a>	<b><sup>a</sup> 23</b>	<b>0 - 14 µg/dL</b>	
Phosphorus	1.6	1.0 - 2.3 mmol/L	
Calcium	2.5	2.1 - 2.8 mmol/L	
Sodium	156	147 - 157 mmol/L	
Potassium	4.5	3.7 - 5.2 mmol/L	
Na:K Ratio	35	29 - 42	
Chloride	121	114 - 126 mmol/L	
Bicarbonate	19	12 - 22 mmol/L	
Anion Gap	21	12 - 25 mmol/L	
Total Protein	71	63 - 88 g/L	
Albumin	33	26 - 39 g/L	

## Urinalysis

	8/13/15 (Order Received) 8/13/15 7:49 AM (Last Updated)		IDEXX Reference Laboratories <a href="#">Show Details</a>
Collection	CYSTOCENTESIS		
Colour	STRAW		
Clarity	HAZY		
<b>Specific Gravity</b>	<b>1.015</b>		
pH	6.0		
Protein	NEGATIVE		
Glucose	NEGATIVE		
Ketones	NEGATIVE		
Blood / Haemoglobin	NEGATIVE		
Bilirubin	NEGATIVE		
Urobilinogen	NORMAL		
White Blood Cells	NONE SEEN		
Red Blood Cells	0-2		
Bacteria	NONE SEEN		
Epithelial Cells	2+ (3-5)		
Mucous	NONE SEEN		
Casts	NONE SEEN		
Crystals	NONE SEEN		
Other	AMORPHOUS DEBRIS		

## Diagnostic plan

A dental cleaning was recommended, and samples were collected for a preanaesthetic screen for complete blood count (CBC); chemistry panel, including the IDEXX SDMA™ Test; total T4; and a complete urinalysis.

## Diagnostic review

- Noteworthy abnormalities found on Jimmy's laboratory/diagnostic tests included an **increased SDMA\* of 23 µg/dL**, and a **low urine specific gravity of 1.015**.
- The balance of the diagnostics, including creatinine and total T4, were within the reference intervals.
- SDMA is an earlier and more reliable biomarker for kidney function than creatinine and warrants follow-up investigation when increased.**

## Haematology

	8/13/15 (Order Received) 8/13/15 7:49 AM (Last Updated)		IDEXX Reference Laboratories <a href="#">Show Details</a>
RBC	7.89	4.9 - 10.0 x 10 <sup>12</sup> /L	
Haematocrit	36.3	0.25 - 0.48 L/L	
Haemoglobin	117	77 - 156 g/L	
MCV	46	39 - 56 fL	
MCH	14.8	12.6 - 16.5 pg	
MCHC	322	282 - 333 g/L	
% Reticulocyte	0.2	%	
Reticulocyte	16	3 - 50 x 10 <sup>9</sup> /L	
WBC	8.4	5.5 - 19.0 x 10 <sup>9</sup> /L	
% Neutrophil	62.3	%	
% Lymphocyte	14.6	%	
% Monocyte	6.6	%	
% Eosinophil	16.4	%	
% Basophil	0.1	%	
Neutrophil	5.233	2.0 - 13.0 x 10 <sup>9</sup> /L	
Lymphocyte	1.226	0.9 - 7.0 x 10 <sup>9</sup> /L	
<b>Monocyte</b>	<b>0.554</b>	<b>0.0 - 0.5 x 10<sup>9</sup>/L</b>	
Eosinophil	1.378	0.0 - 1.0 x 10 <sup>9</sup> /L	
Basophil	0.008	<=0.1 x 10 <sup>9</sup> /L	
Platelet	301	300 - 800 x 10 <sup>9</sup> /L	
Remarks	SLIDE REVIEWED MICROSCOPICALLY.		

## Total T4

	8/13/15 (Order Received) 8/13/15 7:49 AM (Last Updated)		IDEXX Reference Laboratories <a href="#">Show Details</a>
Total T4	<sup>a</sup> 27	10 - 60 nmol/L	
Cats with subnormal T4 values are almost exclusively euthyroid sick or overtreated for their hyperthyroidism. Older cats with consistent clinical signs and T4 values in the grey zone may have early hyperthyroidism or a concurrent non-thyroidal illness. Hyperthyroidism may be confirmed in these cats by adding on a free T4 or by performing a T3 suppression test. Following treatment with methimazole, T4 values will generally fall within the lower end of the reference range			

## Next steps

- The owner was informed that some supportive care and follow-up were indicated for Jimmy ahead of his dental procedure.
- **Increased access to drinking water** (bowl outside, and on different levels inside the home), **a diet designed for senior patients<sup>1</sup>**, and a recheck appointment in 2 weeks were recommended.
- Other considerations included diagnostic imaging of the kidneys and associated structures and assessment of blood pressure.

## Follow-up and diagnosis

- Jimmy presented 1 month later and his lab work showed that **SDMA remained increased but stable at 19 µg/dL and his urine specific gravity was unchanged at 1.015**. The remainder of his lab results remained within the reference interval.
- An abdominal ultrasound showed no evidence of urinary stones or infection but small kidneys, consistent with chronic kidney disease (CKD).
- Systolic blood pressure was 175 mm Hg, which was persistently increased when Jimmy was rechecked a few days later.
- With the results in hand, and following the International Renal Interest Society (IRIS) CKD Staging Guidelines, **Jimmy was diagnosed with IRIS CKD Stage 2 disease**. It was determined that **Jimmy be placed on medication for his high blood pressure and that his owners switch him to a kidney therapeutic diet** while continuing to provide him several fresh water sources.

## Discussion

Cases like Jimmy's are common for general practitioners, and his case **reinforces that even a single elevation in SDMA warrants further investigation and possible management**.

**SDMA detects problems sooner, and it is more reliable than creatinine in assessing kidney function.** Making modest changes in Jimmy's access to fresh water and **instituting a kidney therapeutic diet contributed to the effort of possibly slowing the progression of Jimmy's kidney disease**.

Jimmy's kidney disease was able to be appropriately monitored and managed prior to his dental procedure. **During his dental procedure, additional precautions were also taken to protect his kidneys**. Longer-term regular appointments can be scheduled to monitor his kidney disease more closely thanks to the early detection afforded by SDMA. This will allow for earlier identification and treatment of kidney disease progression and complicating conditions.

## IRIS CKD Staging Guidelines

		Stage 1 No azotemia	Stage 2 Mild	Stage 3 Moderate	Stage 4 Severe
Creatinine in µmol/L	Canine	< 125	125 - 180	180 - 440	> 440
	Feline	< 140	140 - 250	250 - 440	> 440
SDMA in µg/dL		> 14	> 14	Moderately increased	Markedly increased
			≥ 25	≥ 45	
Consider understaged based on creatinine					
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	

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

\*Symmetric dimethylarginine

### Reference

1. Hall JA, MacLeay J, Yerramilli M, et al. Positive impact of nutritional interventions on serum symmetric dimethylarginine and creatinine concentrations in client-owned geriatric cats. *PLoS One*. 2016;11(4):e0153654.

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