# An SDMA case study: Reese

SDMA helps lead to the diagnosis and treatment of suspect pyelonephritis and improvement in kidney function

**Patient:** Reese, 16-year-old, spayed female domestic shorthair

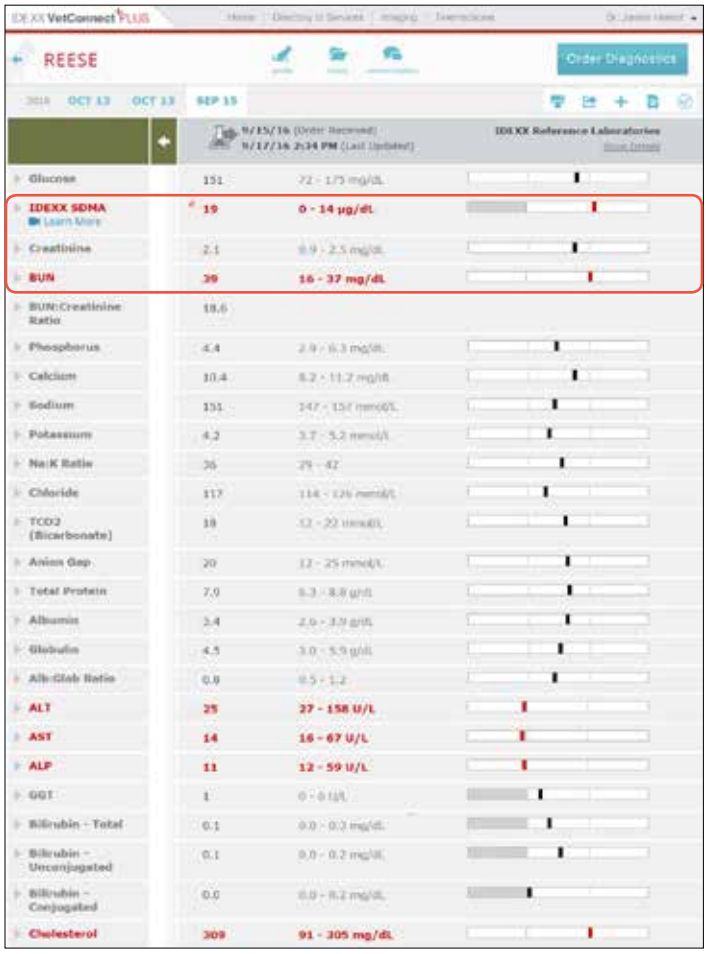
**Presenting reason and history:** Reese presented for her annual wellness visit. The owners felt that Reese was doing well for a senior cat. Her appetite was good, and they had not noticed any weight loss, coughing, sneezing, vomiting, diarrhea, or change in thirst or urination.

**Physical examination:** Reese was bright, alert, responsive, and hydrated. She was a little overweight with a body condition score (BCS) of a 6 on 9-point scale. Her temperature, pulse, and respiration were within normal limits. Thoracic auscultation and abdominal palpation were normal, and the remainder of the physical examination was unremarkable.

## Diagnostic plan

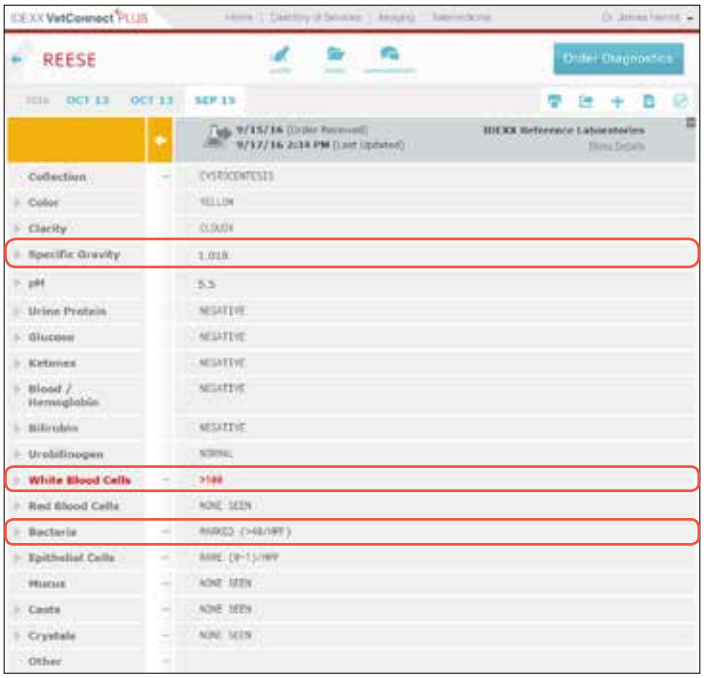
Complete blood count (CBC); chemistry panel, including the IDEXX SDMA® Test and electrolytes; complete urinalysis; and total $T_4$ were recommended for a senior wellness minimum database. Reese's CBC results were within normal limits. Other findings are shown below.

### Chemistry




### Total $T_4$


### Urinalysis




### Urine culture and MIC susceptibility


## Diagnostic review

Reese's diagnostic results showed an increased SDMA along with a normal creatinine and increased BUN. She also had inappropriate urine concentrating ability with a urine specific gravity of 1.018. In addition, Reese had an active urine sediment with >100 WBC/hpf and marked bacteriuria. Based on these findings, a urine culture and susceptibility was performed and >100,000 organisms/mL of *Escherichia coli* was grown that was susceptible to most antibiotics, including amoxicillin and amoxicillin/clavulanic acid.

## Assessment

Based on Reese's increased SDMA with an inappropriately low urine specific gravity, it was clear that she had decreased kidney function in addition to having a urinary tract infection.

Differentials at this time included:

- Active or acute kidney injury (AKI) secondary to pyelonephritis.
- Chronic kidney disease (CKD) with a concurrent lower urinary tract infection (UTI).
- AKI from pyelonephritis superimposed on CKD, causing a worsening of existing kidney disease.

## Plan

### Investigate

Additional diagnostics that should have been considered to investigate further but were not performed:

- Abdominal ultrasound to look for evidence of pyelonephritis and rule out urolithiasis.
- Blood pressure since hypertension is a common confounding factor with kidney disease.

### Manage

Treatment initiated:

- Clavamox® 62.5 mg by mouth twice daily for one month for possible pyelonephritis.
- Fresh clean water sources available at all times.
- Diet changed to Hill's® Prescription Diet® k/d® Feline and Royal Canin Veterinary Diet® Renal™ cat formula.

### Monitor

Recheck visit:

- Ideally in 2 weeks to determine response to treatment.
- However, recheck was done in 1 month to see if infection cleared and if any improvement in kidney function.
- Follow-up diagnostics revealed that the SDMA concentration had declined from 19 µg/dL to 15 µg/dL, there were no WBCs or bacteria on the urine sediment, and the culture was negative.

### Chemistry


### Urinalysis


### Urine culture


## Diagnosis and long-term management

### Diagnosis

- Suspect pyelonephritis based on improvement in kidney function after treatment of UTI.
- AKI from pyelonephritis superimposed on CKD.

### Long-term management

- Treat for International Renal Interest Society (IRIS) stage 2 CKD, including continuing to feed a kidney therapeutic diet.[1] For more information, visit idexx.com/sdma-iris.
- Recheck urine culture monthly for 3 negative consecutive months.
- Then recheck minimum database and urine culture every 3 months.

## Discussion

- SDMA is a more reliable indicator of kidney function than creatinine in both AKI as well as CKD because it is more sensitive and increases earlier.[2-4]
- In pets like Reese, an increased SDMA in face of a urinary tract infection, should lead to additional investigation and a consideration for more aggressive treatment for pyelonephritis.
- Long-term management and monitoring of these pets can help prevent and detect future infections and slow progression of underlying CKD.


**References**

1. International Renal Interest Society. IRIS Guidelines. www.iris-kidney.com. Accessed March 21, 2017.
2. Nabity MB, Lees GE, Boggess M, et al. Symmetric dimethylarginine assay validation, stability, and evaluation as a marker for early detection of chronic kidney disease in dogs. *J Vet Intern Med*. 2015;29(4):1036–1044.
3. Hall JA, Yerramilli M, Obare E, Yerramilli M, Jewell DE. Comparison of serum concentrations of symmetric dimethylarginine and creatinine as kidney function biomarkers in cats with chronic kidney disease. *J Vet Intern Med*. 2014;28(6):1676–1683.
4. Hall JA, Yerramilli M, Obare E, Yerramilli M, Almes K, Jewell DE. Serum concentrations of symmetric dimethylarginine and creatinine in dogs with naturally occurring chronic kidney disease. *J Vet Intern Med*. 2016;30(3):794–802.