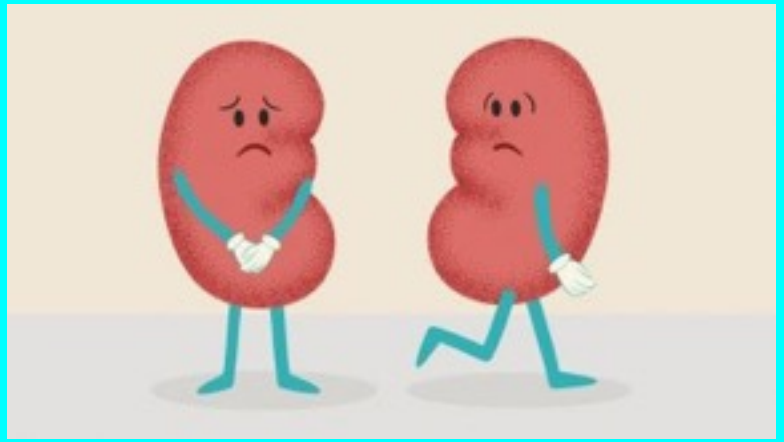
Diagnosing Kidney Disease:
Don't Delay! Utilize SDMA!

Symmetric Dimethylarginine



IDEXX

A Powerpoint Presentation for Lunch And Learn
by Sharisse Berk, DVM • 11/23/2020

Chronic Kidney Disease (CKD)

- **Common:** 1 in 3 cats and 1 in 10 dogs will develop some form of kidney disease in their lifetime.
- **Progressive:** Damage can occur to any part of the nephron (which can result in irreversible damage and loss of function of the nephron).
- **Early diagnosis and management** may modify the rate of progression and improve patient quality and quantity of life.

Diagnosis of CKD in the Past

- Azotemia (↑BUN, ↑Creat with ↓U.S.G) is seen when there's approximately 75% loss of nephron function.

- BUN can be influenced by several extrarenal factors:
  - Dehydration
  - Protein content of the diet
  - GI Bleeding
  - Liver Insufficiency

- Creatinine = breakdown product of muscle (used in IRIS Staging)
  - Pro = Better indicator of GFR
  - Con = Can be influenced by a reduction in muscle mass

IRIS Guidelines

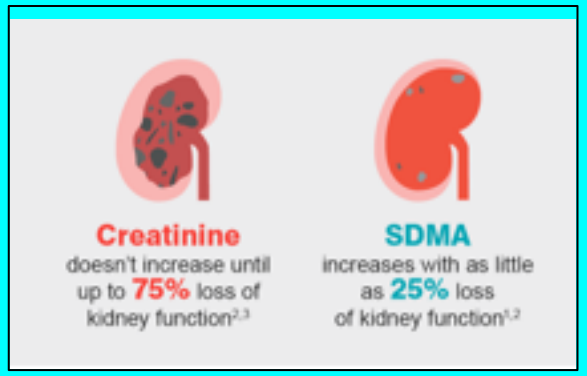
Step 2: Stage CKD

	Stage 1 No azotemia (Normal creatinine)	Stage 2 Mild azotemia (Normal or mildly elevated creatinine)	Stage 3 Moderate azotemia	Stage 4 Severe azotemia
Creatinine in mg/dL Stage based on stable creatinine — Canine	Less than 1.4 (125 µmol/L)	1.4–2.8 (125–250 µmol/L)	2.9–5.0 (251–440 µmol/L)	Greater than 5.0 (440 µmol/L)
Feline	Less than 1.6 (140 µmol/L)	1.6–2.8 (140–250 µmol/L)	2.9–5.0 (251–440 µmol/L)	Greater than 5.0 (440 µmol/L)
SDMA* in µg/dL Stage based on stable SDMA — Canine	Less than 18	18–35	36–54	Greater than 54
Feline	Less than 18	18–25	26–38	Greater than 38

Don’t stage animals that are dehydrated

Symmetric Dimethylarginine (SDMA)

- Brought to the market in 2015 (thank you IDEXX for raising the standard of care.)
- ↑ **SDMA** indicates impaired GFR
- Sensitive indicator of kidney function that detects as little as 25% loss of function.
- More reliable than Creatinine because not influenced by muscle mass.
- Can be used to monitor progression/improvement.
- Increased **SDMA** may serve as an indicator of concurrent disease that may have a secondary impact on kidney function.



Symmetric Dimethylarginine (SDMA)

Detects:

- Diseases of the kidney sooner
  - Chronic Kidney Disease (CKD)
  - Acute Kidney Injury
  - Pyelonephritis
  - Upper urinary obstruction
  - Kidney Stones
  - Glomerulonephritis
  - Congenital Disease

Reflects:

- Other disease processes affecting the kidneys
  - Hyperthyroidism
  - Vector-borne disease
  - Systemic hypertension
  - Cardiorenal syndrome
  - Lower urinary obstruction
  - Sepsis
  - Cancer
  - Drug Toxicity

Example: Leptospirosis will present as acute renal disease 90% of the time!

Zoey (15 year old, FS, DSH)

History (Presented 11/2/20).

- Vomited once 5d ago.
- Hasn't eaten since.
- Lethargic.
- Drinking water and urinating normally. No prior hx of PU/PD.
- No hx of diarrhea/no recent bm.
- No hx of getting into anything (f.b., plants, etc).

PE Findings

- MM = pink, tacky; crt = 3 secs
- H/L auscult normal
- Abd palpates very tense, painful over kidneys
- Bladder = small ☹
- Moderate muscle atrophy over spine

Wt=9#14oz; BCS=3/5; T=99.3; HR=160 bpm;
RR=52 breaths/min, Approx 8% dehydrated.

Differentials

CKD/Pyelonephritis

Hepatic Lipidosis?

Diagnosis?

Intestinal Dz (IBD; Int LSA; Pancreatitis)?

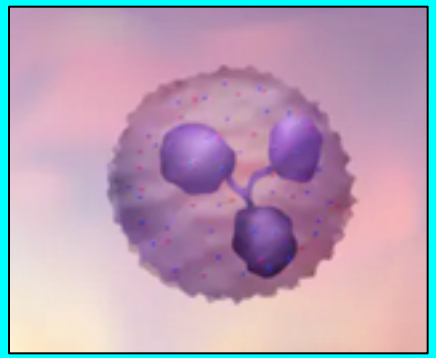
Imaging (Rads)

Labs

Senior Panel to Idexx with add-on Spec fPL (to assess for pancreatitis/int dz).
Unable to obtain urine for Complete UA. Owner to bring sample the next day.

CBC

- No obvious anemia
  HCT=37.2% (28.2-52.7)
- Mild leukocytosis
  ↑ WBC=19.4 (3.9-19)
- Neutrophilia
  ↑ Neuts=17402 (2620-15170)



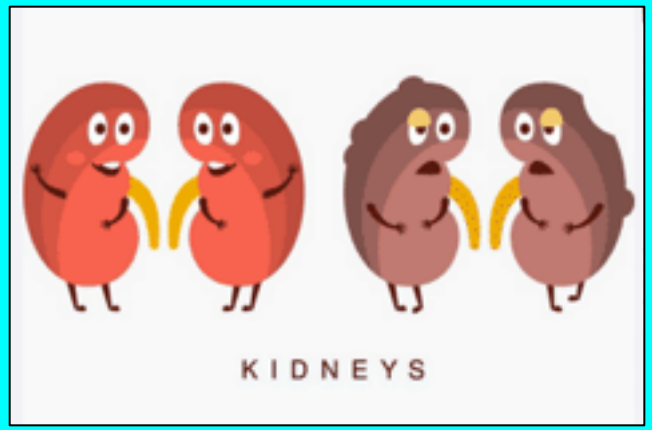
CHEM

↑BUN=64 (16-37)
Creat=2.2 (0.9-2.3)
↑**SDMA**=29 (0-14)
Phos=4.9 (2.9-6.3)

↓Ca=8.0 (8.2-11.2)
Alb=2.8 (2.6-3.9)
Azotemia!
Mild hypocalcemia!

*These are partial results: Spec fPL=pending!

Comparison from routine screen 4/8/20
BUN=39
Creat=1.4
SDMA=12



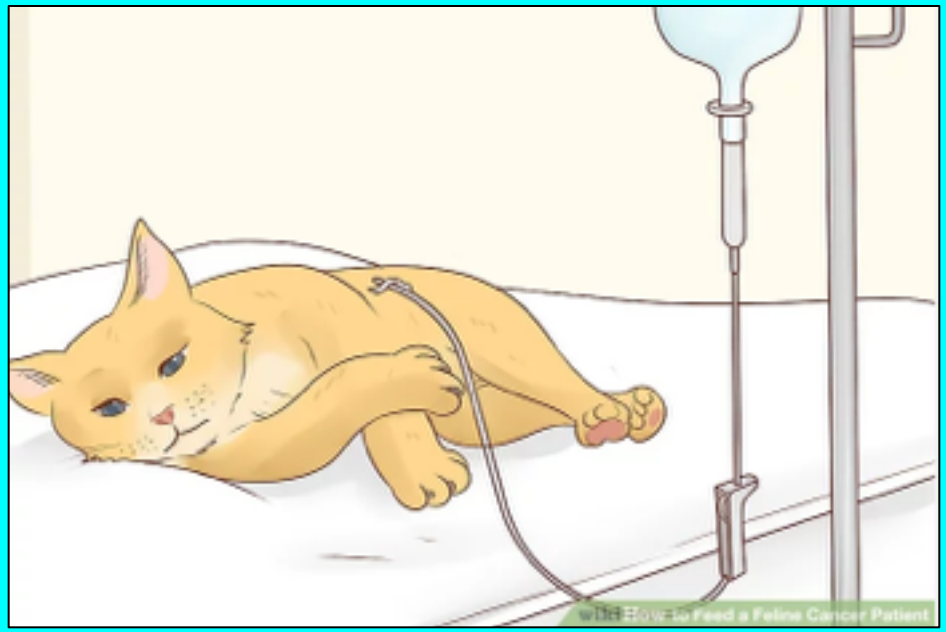
Side Bar Plug for Spec fPL

- Chem results show mild hypocalcemia
- R/O's for this include CKD, Intestinal dz & Acute Pancreatitis
- In one study, ionized Ca++ levels were low in 61% of cats with acute pancreatitis
- Results of Spec fPL=0.5 (0-3.5)=no pancreatitis, GI dz unlikely!

Treatment while awaiting lab results

- SQ fluids
- Vitamin B12
- Mirataz
- Recovery diet.

Does this pet need a renal diet? **NO!**



Complete UA Results (Voided) - Reported 11/4/20

- Yellow/cloudy
- U.S.G=1.016
- pH=6
- Protein=2+
- Bld=2+

Sed: WBC's=75-100/hpf
RBC's=6-10/hpf
Bacteria=Marked rods >40/hpf.

DX=Pyelonephritis!

(Two proprietary Idexx tests put me on the path to the Dx=SDMA, Spec fPL).

Rx: Baytril 22.7 mg: 1 sid x 14d, then recheck labs.

Medical Remorse=Not obtaining urine for c/s prior to antibiotics.

Follow-up Labs for Zoey

Iris Stage (Feline)

	Stage 1	Stage 2	Stage 3	Stage 4
Creat	**<1.6**	**1.6-2.8**	**2.9-5.0**	**>5.0**
SDMA	**<18**	**18-25**	**26-38**	**>38**

4/8/20
BUN=39 (16-37)
Creat=1.4 (0.9-2.5)
SDMA=12 (0-14)
No UA

Is this stage 1?

11/2/20
BUN=64
Creat=2.2
SDMA=29
U.S.G=1.016
Protein=2+
Bld=2+
WBC's=75-100/hpf
RBC's=5-10/hpf
Marked rods >40/hpf

Is this stage 2 or 3?

11/18/20
BUN=49
Creat=1.7
SDMA=21
U.S.G=1.014
Protein=1+
Bld=3+
WBC's=>100/hpf
RBC's=50-75/hpf
Marked rods >40/hpf

Is this early stage 2?

Conclusion

- **SDMA** is a biomarker that can detect impaired GFR (earlier than Creat).
  It can detect as little as 25% loss of kidney function (in ckd.)

Who should utilize **SDMA**?

- All Veterinarians who treat dogs and cats

BECAUSE

- All of our pets should be screened for kidney dis

Quotes

- "You can't find what you don't look for."

Similar to:

- "Do you see patients with early kidney disease because patients with early kidney disease see you!"

- "Don't just stand there...Do Something!"

The point: Don't just label an IRIS stage and send home a renal diet. Try to find the underlying cause, e.g., Pyelonephritis, Uroliths, Systemic hypertension, etc.

- Comedian Bill Engvall: "Here's Your Sign!"
  That sign is **SDMA!**

Potential Future Lunch and Learn Topics

- "Don't Pooh Pooh the Fecal Antigen Profile":
  Best testing for diagnosing Intestinal Parasites
- U P C What Proteinuria Does to the Kidneys

Acknowledgements:

Special thank you to Dr. Lynn Allen for all of her assistance,
recommendations and for guiding me through this process.

Additional gratitude for your time and consideration to the following Idexx Members:

Dr. Meg Conlon
Dr. Sherri Rigby
Dr. Bryan Rothlein
Mr. Jeff Niziolek
Ms. Joanna Reatiraza
Ms. Gina Valliere

Thank you to the Idexx website and representatives
for providing information for this presentation.

Thank you to Dave Rotter of RotterVision.com for graphics support