

VMX
2025
VETERINARY MEETING & EXPO

Festival of the HeARTS



Presented By:

NAVC
YOUR VETERINARY COMMUNITY

JANUARY 25-29

ORLANDO, FLORIDA

NAVC.COM

The SDMA is high but everything else is normal

Managing discrepant results

Sarah L. Sweet, DVM



Conflict of Interest Disclosure:

I am a full-time employee of IDEXX Laboratories



- What is "normal" anyway?

Refresher

+ Reference Interval

- + A statistical description of the *center 95%* of a *healthy* population
 - + Different populations may have different results! (large breed puppy, adult toy dog, kitten adult cat)

Reference intervals describe where most healthy patient results fall,
but do not tell you whether your patient is healthy

+ Clinical Decision Point

- + Determines which values separate *healthy from diseased* animals

The clinical decision point **may or may not align** with upper and lower limits of the reference interval

IRIS Chronic Kidney Disease Guidelines

		Stage 1 No azotemia (Normal creatinine)	Stage 2 Mild azotemia (Normal or mildly elevated creatinine)	Stage 3 Moderate azotemia	Stage 4 Severe azotemia
0.5 - 1.8 mg/dL	Creatinine in mg/dL	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)
	Canine				
0.9 - 2.3 mg/dL	Creatinine in mg/dL	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)
	Feline				
0 - 14 ug/dL	SDMA* in µg/dL	Less than 18	18–35	36–54	Greater than 54
	Canine				
	SDMA* in µg/dL	Less than 18	18–25	26–38	Greater than 38
	Feline				
	UPC ratio	Nonproteinuric <0.2 Borderline proteinuric 0.2-0.5 Proteinuric >0.5			
	Canine				
	UPC ratio	Nonproteinuric <0.2 Borderline proteinuric 0.2-0.4 Proteinuric >0.4			
	Feline				
Systolic blood pressure in mm Hg Substage based on blood pressure		Normotensive <140 Prehypertensive 140-159 Hypertensive 160-179 Severely hypertensive ≥180			

Biological Variability

+ Describes the *expected variation without a change in health status*

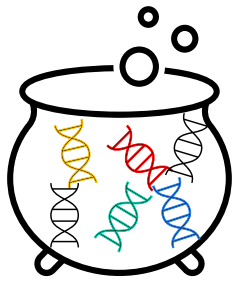


January 15



June 15

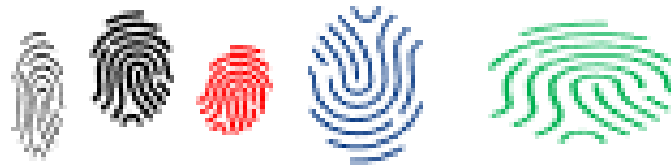
Total Biological Variability



Intraindividual Variability - Variability within a SINGLE individual



Interindividual Variability - Variability between MULTIPLE individuals

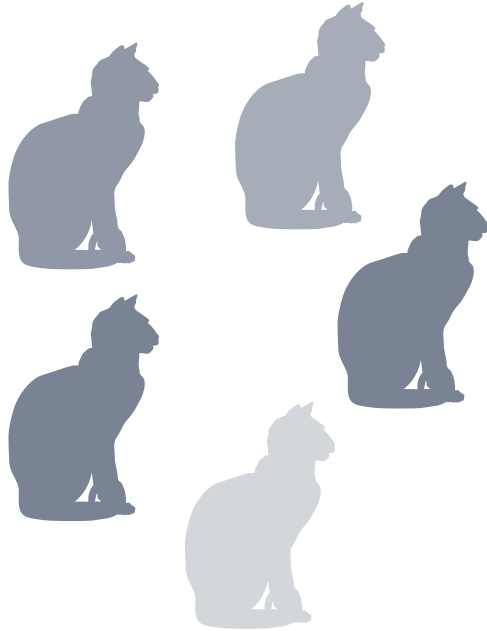


Analytical Variability - Variability of the INSTRUMENT

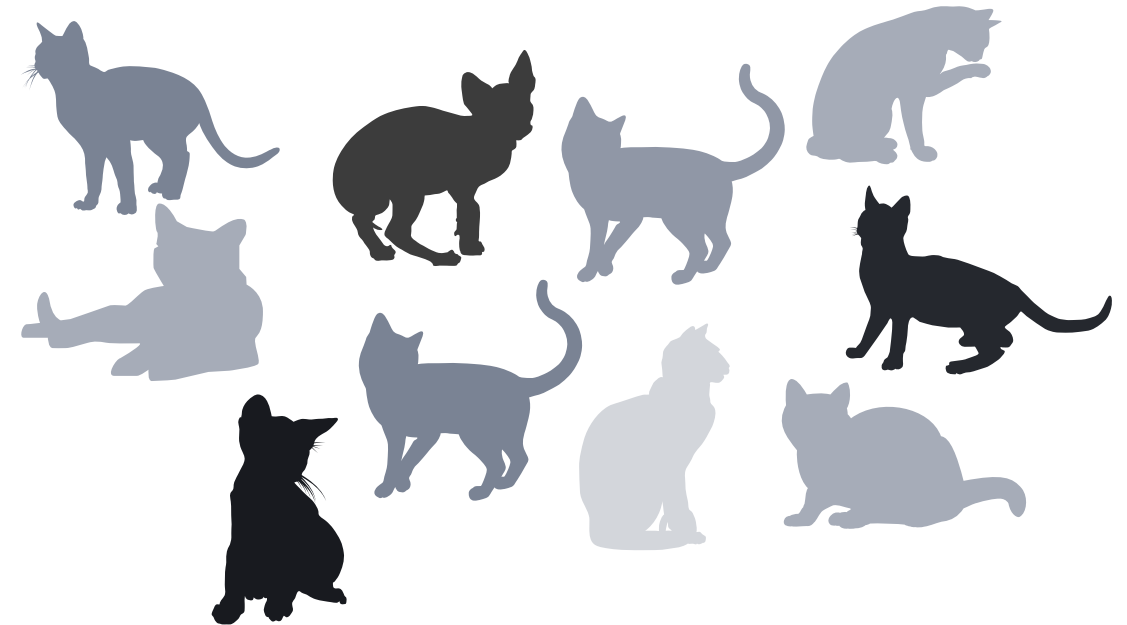


Index of Individuality (IOI)

Intra-individual variation

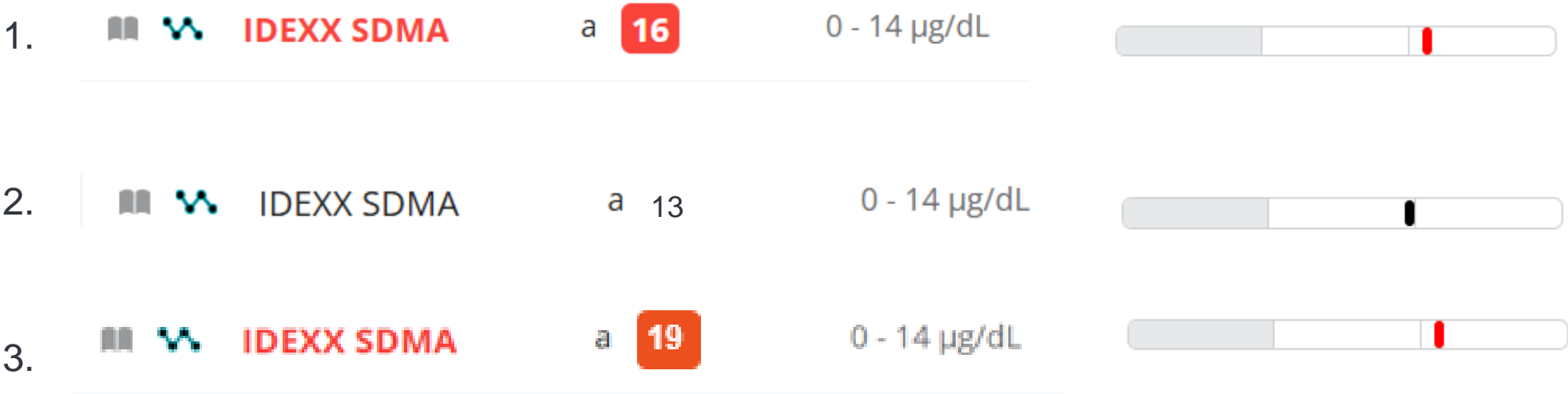


Inter-individual variation



**IOI is the ratio of
Intra-individual to Inter-individual variation**

"The SDMA was high and now it's normal..."



SDMA Biological Variability is 15-20%

"Split" Samples



Point of Care








Reference Laboratory

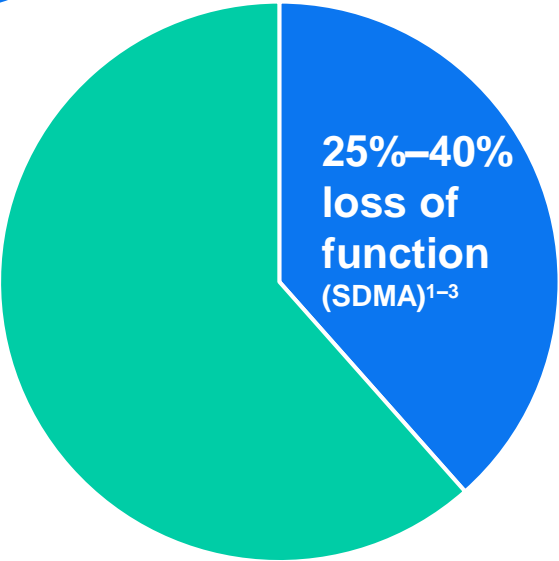
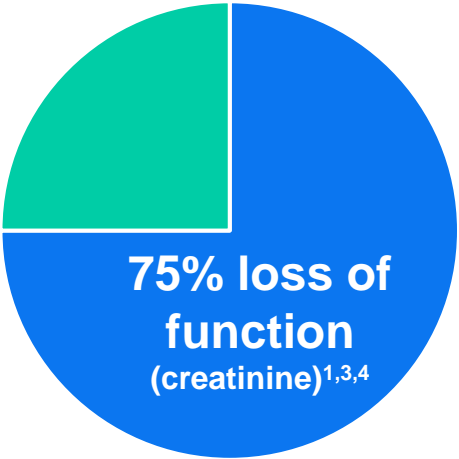
Increased SDMA without kidney disease

- + Any reason GFR is decreased
 - + Prerenal - hypovolemia
 - + Addison's disease, hypothyroidism
 - + Post-renal - urethral obstruction
 - + Sedation
- + Breed differences
 - + Greyhounds
 - + Birman
- + Juveniles



SDMA increased with normal creatinine

IDEXX VetConnect PLUS				
Home Directory of Services Imaging Telemedicine				
				
Chemistry		9/15/18 2:40 AM		
Glucose	74	72 - 175 mg/dL		
IDEXX SDMA	a 19	0 - 14 µg/dL		
Creatinine	2.0	0.9 - 2.5 mg/dL		
BUN	34	16 - 37 mg/dL		



References

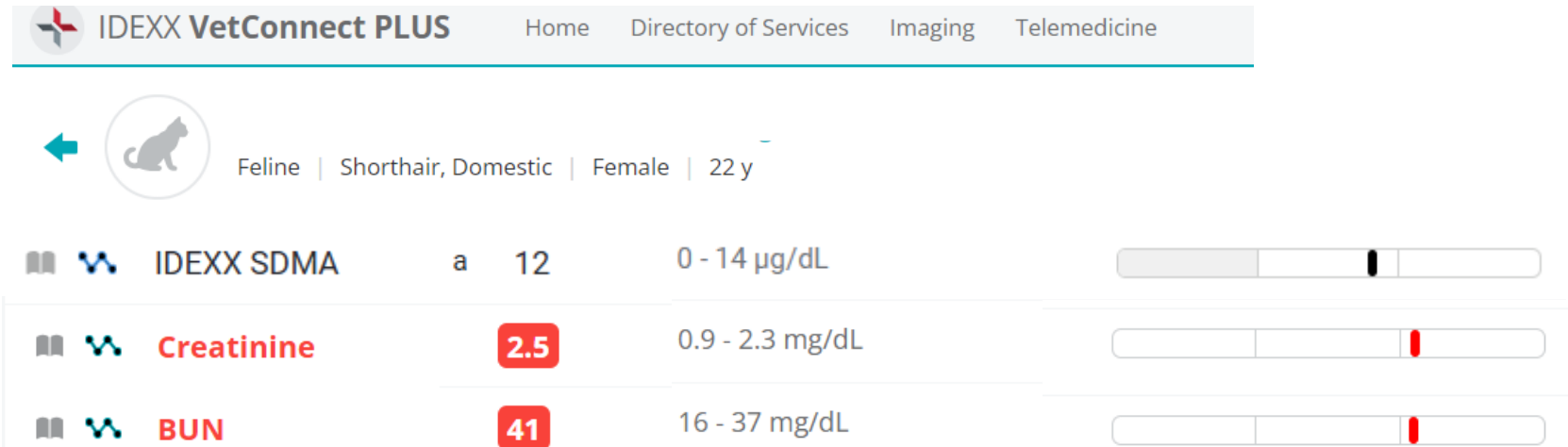
1. Hall JA, Yerramilli M, Obare E, Yerramilli M, Yu S, Jewell DE. Comparison of serum concentrations of symmetric dimethylarginine and creatinine as kidney function biomarkers in healthy geriatric cats fed reduced protein foods enriched with fish oil, L-carnitine, and medium-chain triglycerides. *Vet J.* 2014;202(3):588–596. doi:10.1016/j.tvjl.2014.10.021

2. 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. doi:10.1111/jvim.13942

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. Nabity MB, Lees GE, Boggess MM, et al. Symmetric dimethylarginine assay validation, stability, and evaluation as a marker for the early detection of chronic kidney disease in dogs. *J Vet Intern Med.* 2015;29(4):1036–1044. doi:10.1111/jvim.12835

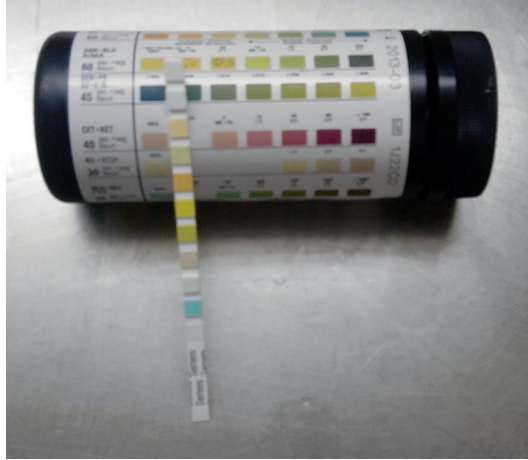
Creatinine increased with normal SDMA



Factors affecting results

- + Biological variability
- + Muscle mass, meat ingestion
- + Assay variability
- + Normal fluctuation
- + Marked hemolysis
- + Freezing may decrease results on catalyst

Proteinuria

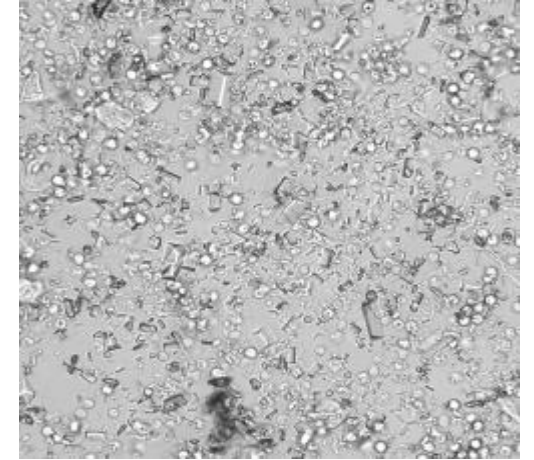


Discuss dipstick proteinuria sens/spec

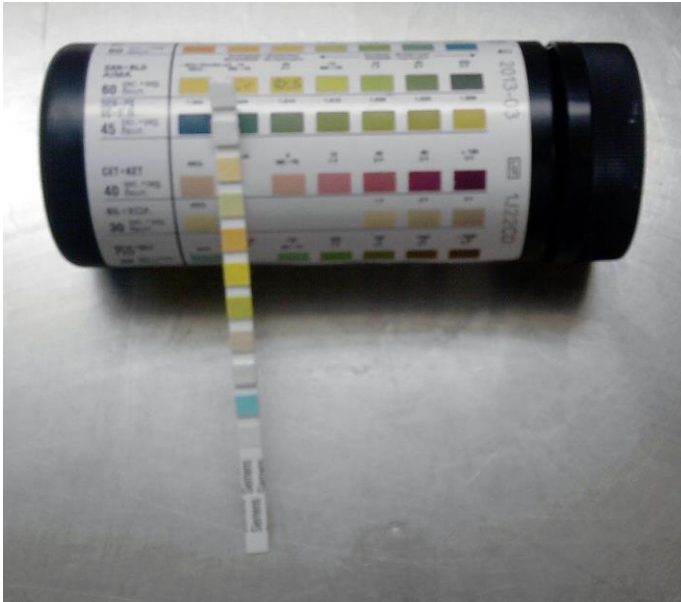
When to run UPC
quiet sediment

Give plug for Sedivue Bacteria Confirmation Kit

What degree of RBC, WBC, bact are acceptable in a sample to run a UPC



Proteinuria

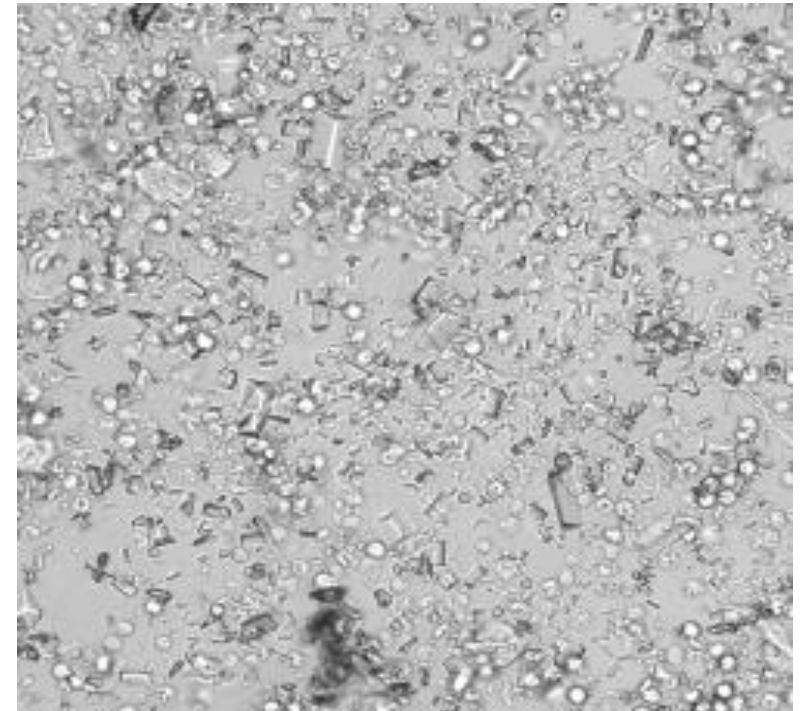


Dipstick

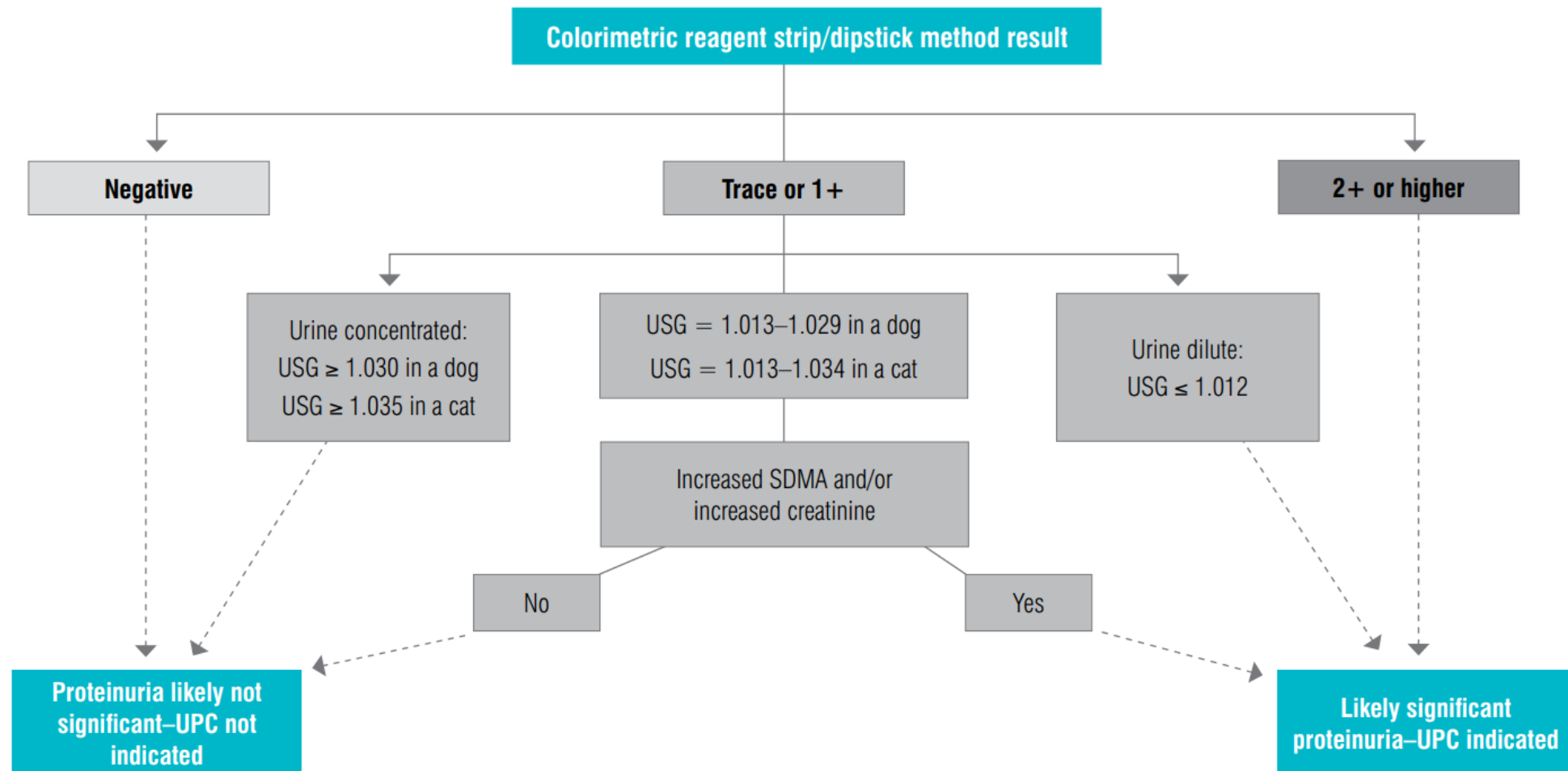
- Usually first line screening test
- Relatively low sensitivity and specificity¹
- USG a factor

Pathologic Proteinuria

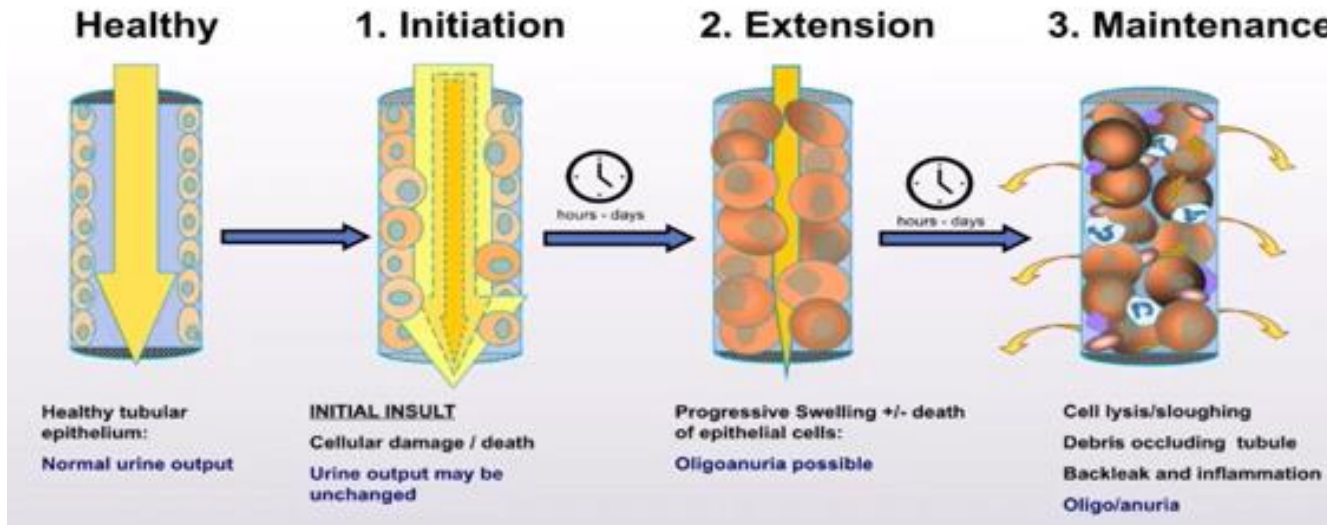
- Renal
 - Glomerulopathy
- Non-renal
 - Inflammation
 - Hemorrhage



¹ <https://www.iris-kidney.com/proteinuria>



Cystatin B increased with normal functional markers

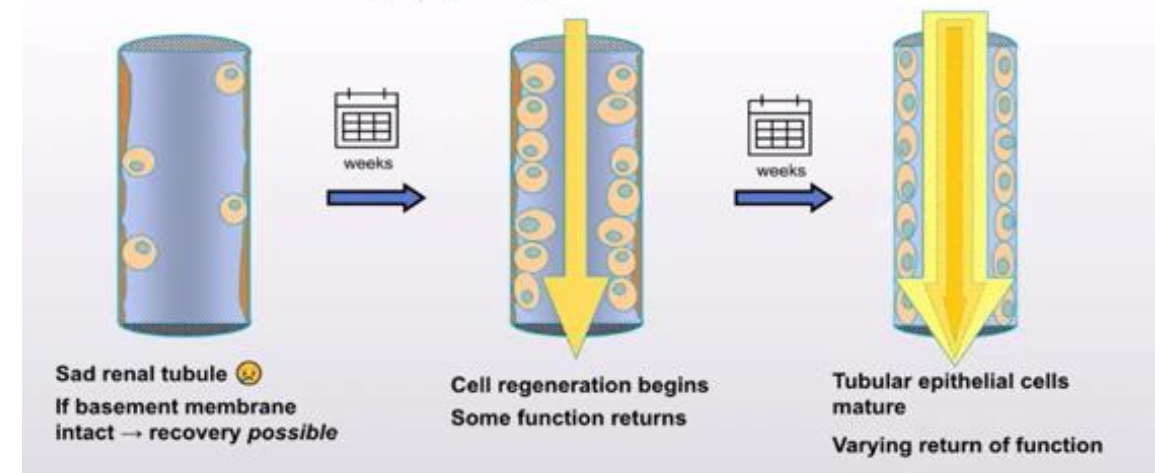


Acute injury often **subclinical** during phases 1 and 2

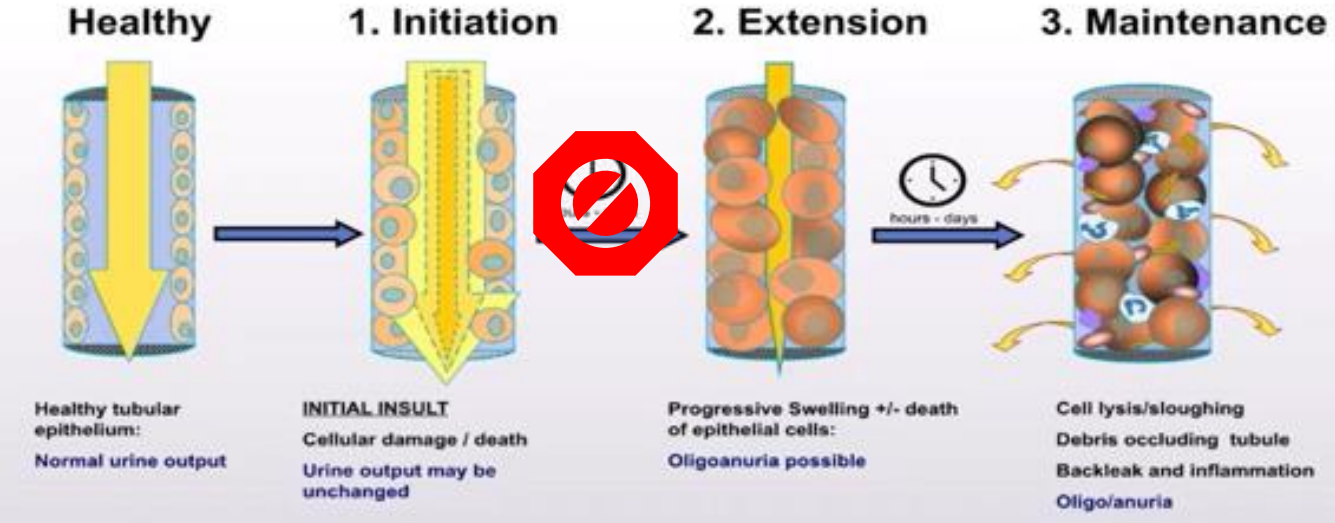
Functional markers and change in urine output appear in phase 3

Potential to affect outcome depends on early identification of AKI

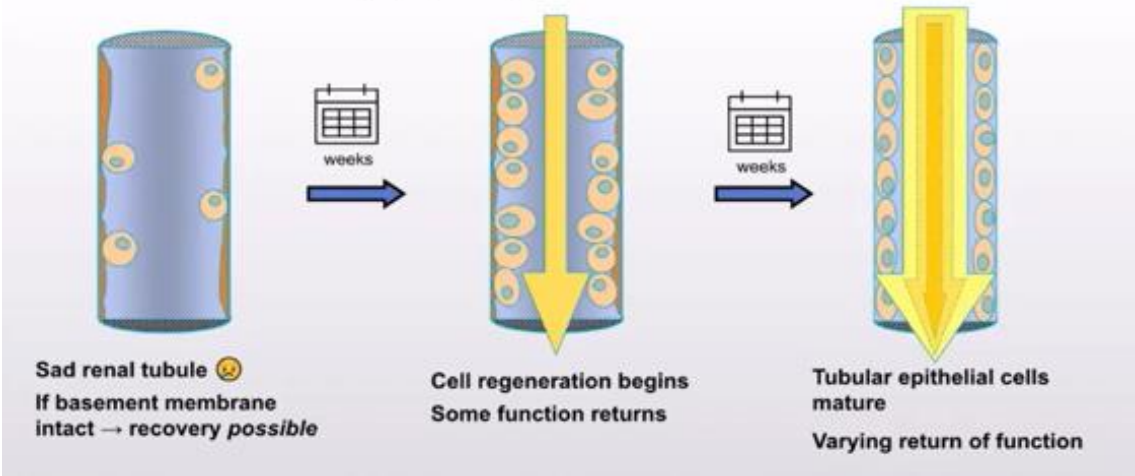
4. Recovery (hopefully)



Cystatin B increased in a "healthy"



4. Recovery (hopefully)



Questions?