VITICUSGROUP™
WVC ANNUAL CONFERENCE
MARCH 2 - 5, 2025 | LAS VEGAS, NV

The SDMA is high but everything else is normal

Managing discrepant results

Sarah L. Sweet, DVM

Conflict of Interest Disclosure:

I am a full-ime 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

0.5 - 1.8 mg/dL

0.9 - 2.3 mg/dL

0 - 14 ug/dL

	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 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 Canine	Less than 18	18–35	36–54	Greater than 54
Feline	Less than 18	18–25	26–38	Greater than 38
UPC ratio Canine	Nonproteinuric **<0.2** Borderline proteinuric **0.2-0.5** Proteinuric **>0.5**			
Faline	Nonproteinuric **<0.2** Borderline proteinuric **0.2-0.4** Proteinuric **>0.4**			
Systolic blood pressure in mm Hg Substage based on blood pressure	Normotensive **<140** Prehypertensive **140-159** Hypertansive **160-179** Severely hypertensive **≥180**			

http://www.iris-kidney.com/pdf/IRIS_Pocket_Guide_to_CKD_2023.pdf

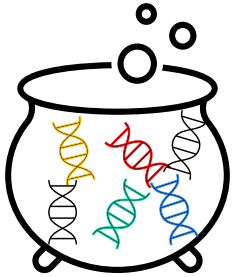
Biological Variability

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

January 15

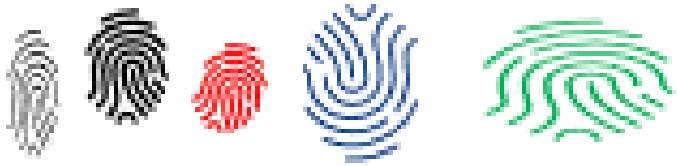
June 15

Total Biological Variability



Intraindividual Variability - Variability within a SINGLE individual

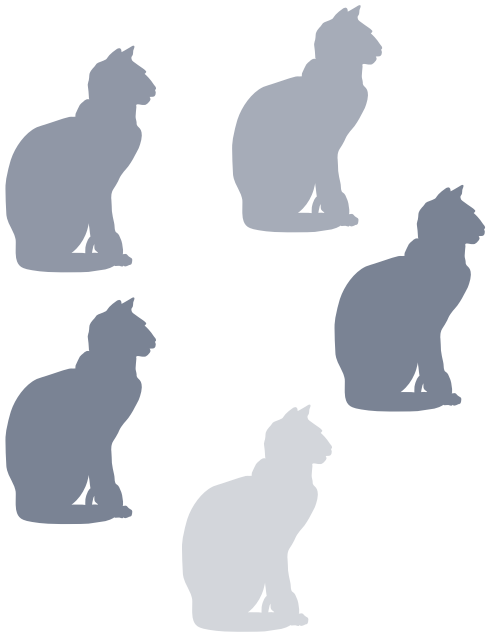
Interindividual Variability - Variability between MULTIPLE individuals



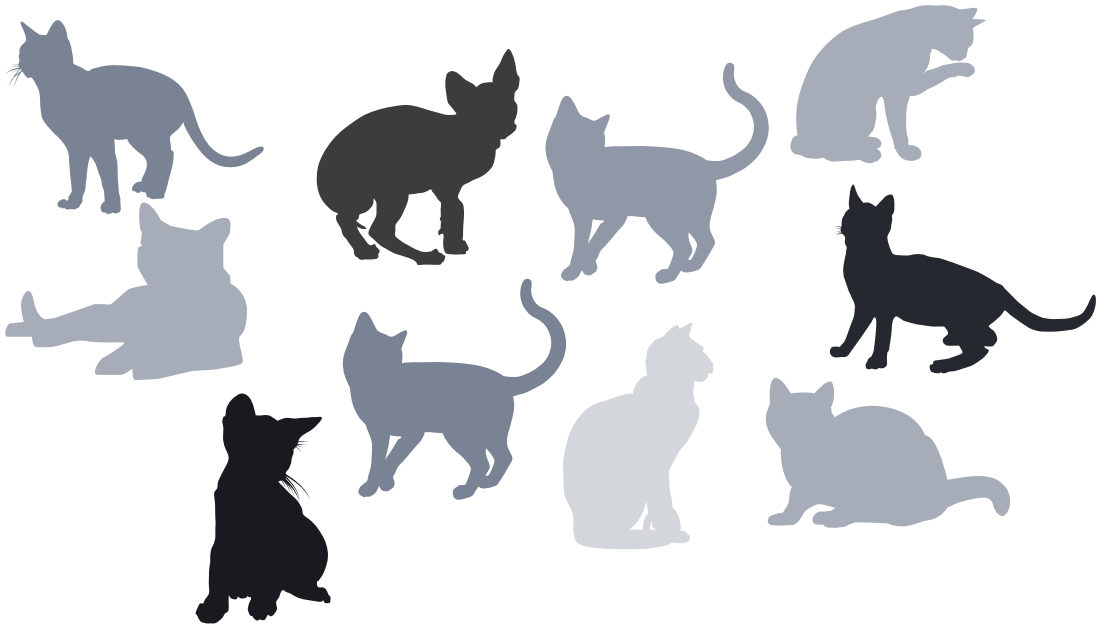
Analytical Variability - Variability of the INSTRUMENT

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…"

1.	IDEXX SDMA	a	16	0 - 14 µg/dL	
2.	IDEXX SDMA	a	13	0 - 14 µg/dL	
3.	IDEXX SDMA	a	19	0 - 14 µg/dL	

SDMA Biological Variability is 15-20%

"Split" Samples

Point of Care

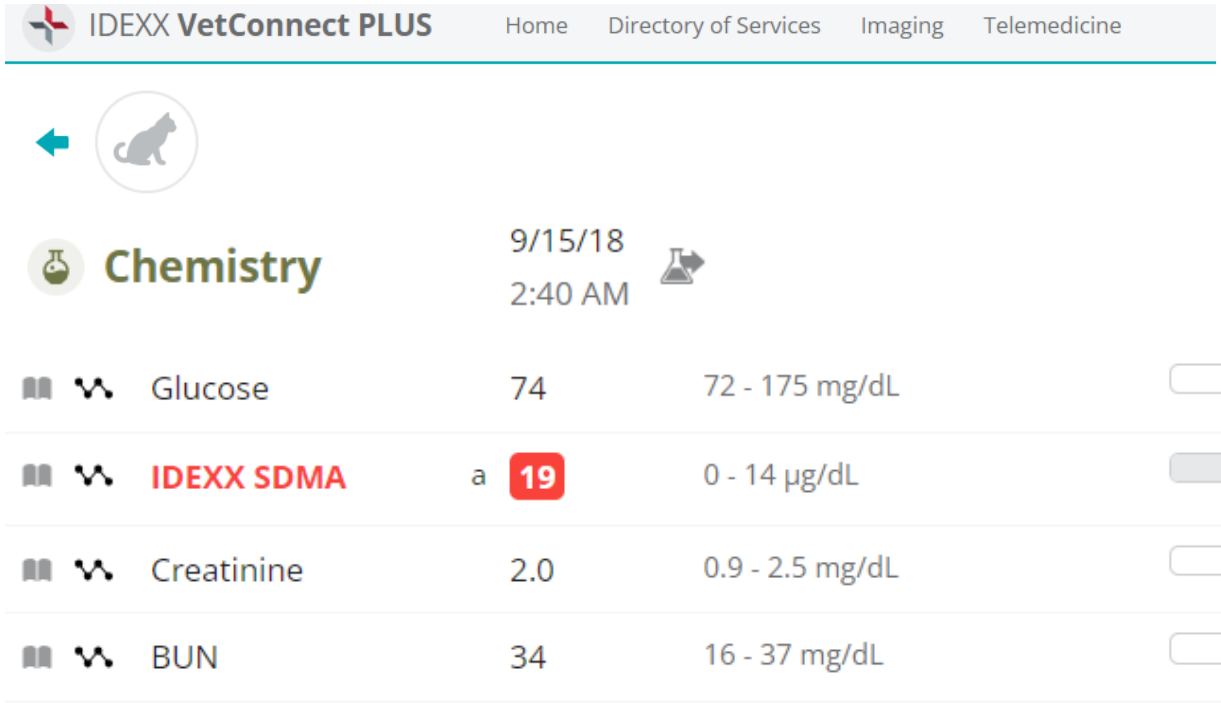
≠

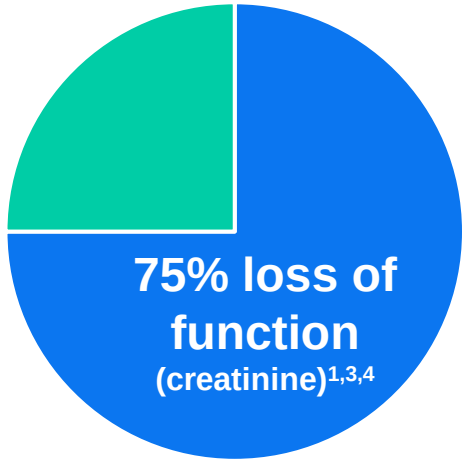
Reference Laboratory

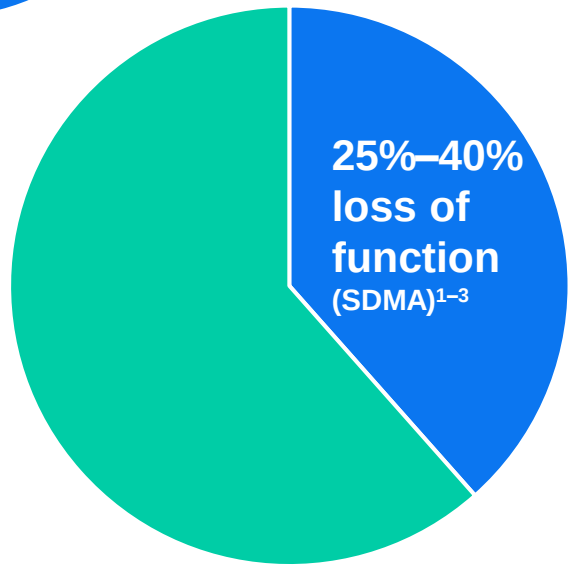
Increased SDMA without kidney disease

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

SDMA increased with normal creatinine



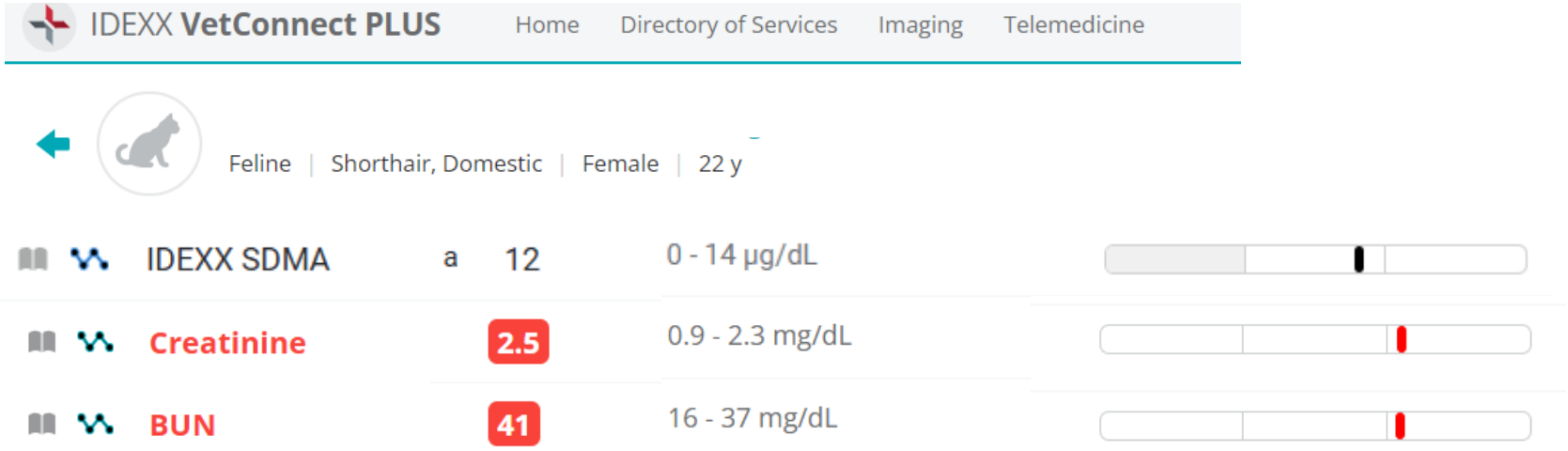




References

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

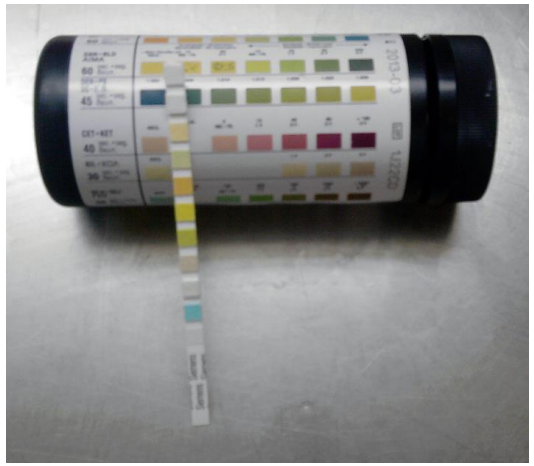


Factors affecting results

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

Braun e al.

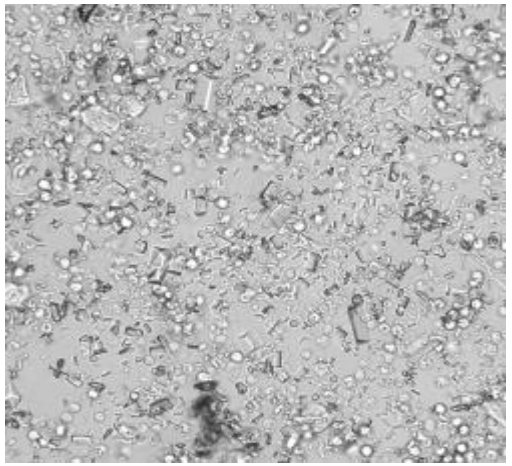
Proteinuria



Discuss dipstick proteinuria sens/spec

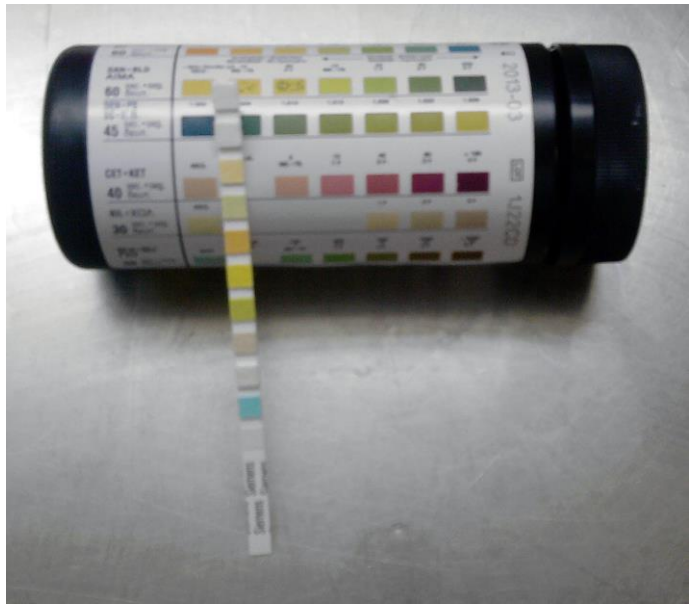
When to run UPC
quiet sediment

Give plug for Sedivue Bacteria Confirmation Kit



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

Proteinuria

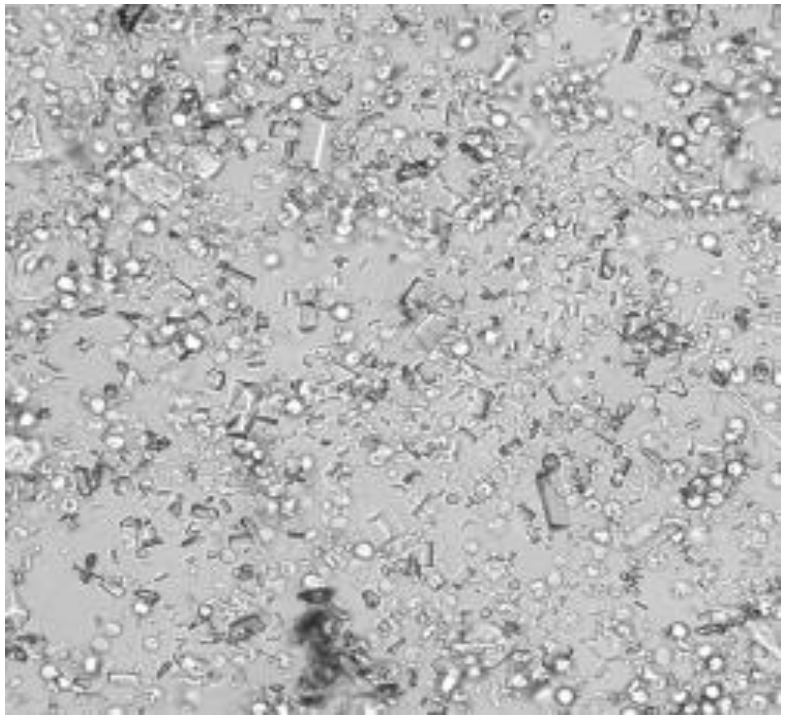


Dipstick

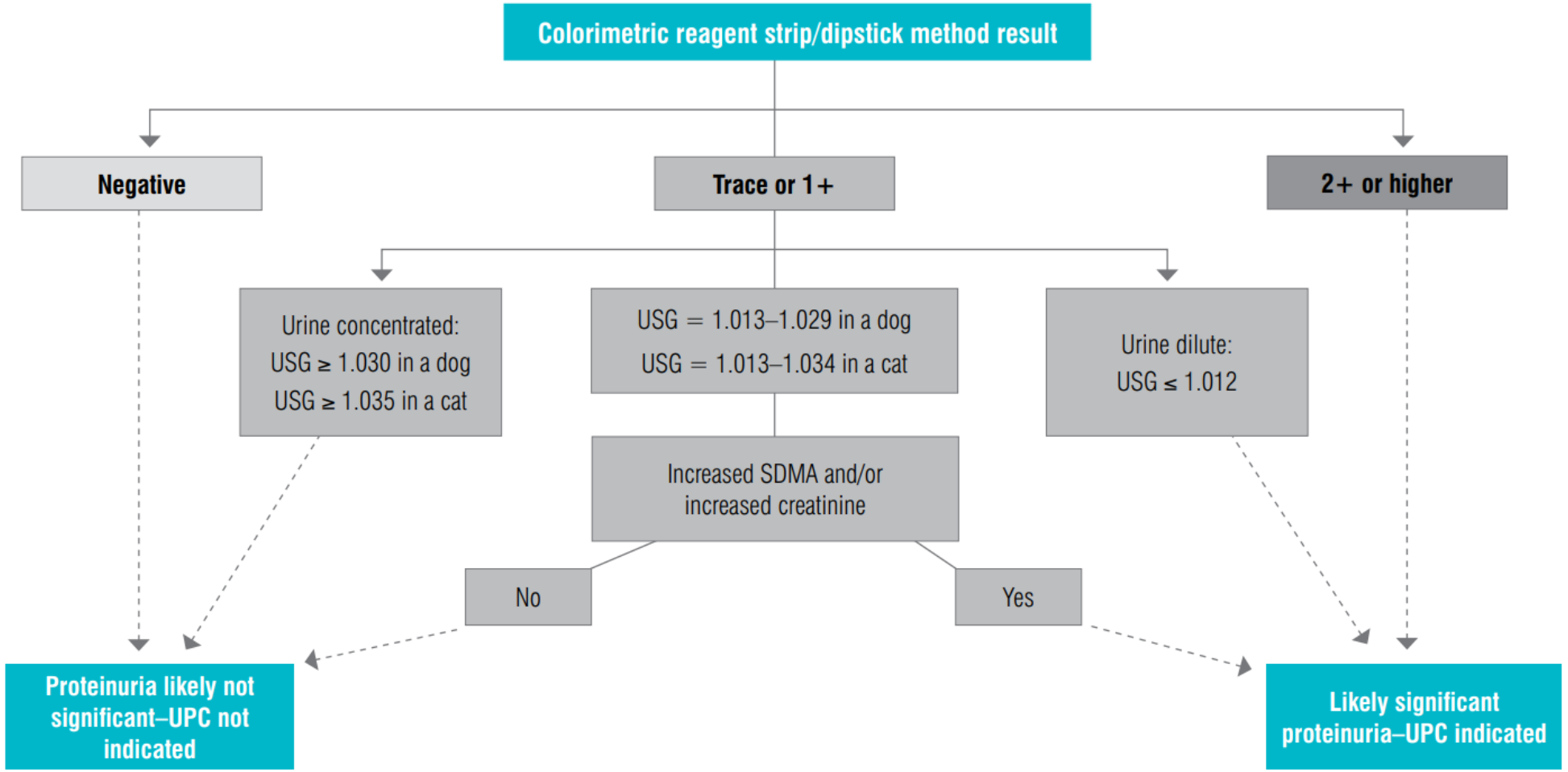
- Usually first line screening test
- Relatively low sensitivity and specificity[1]
- USG a factor

Pathologic Proteinuria

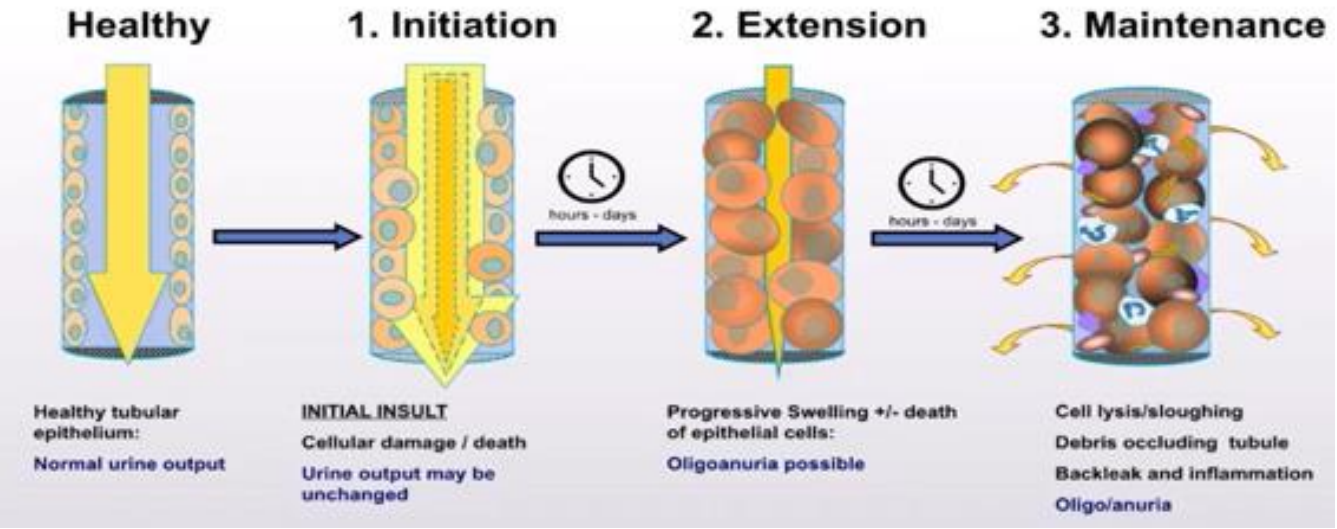
- Renal
  - Glomerulopathy
- Non-renal
  - Inflammation
  - Hemorrhage



[1] https://www.iris-kidney.com/proteinuria



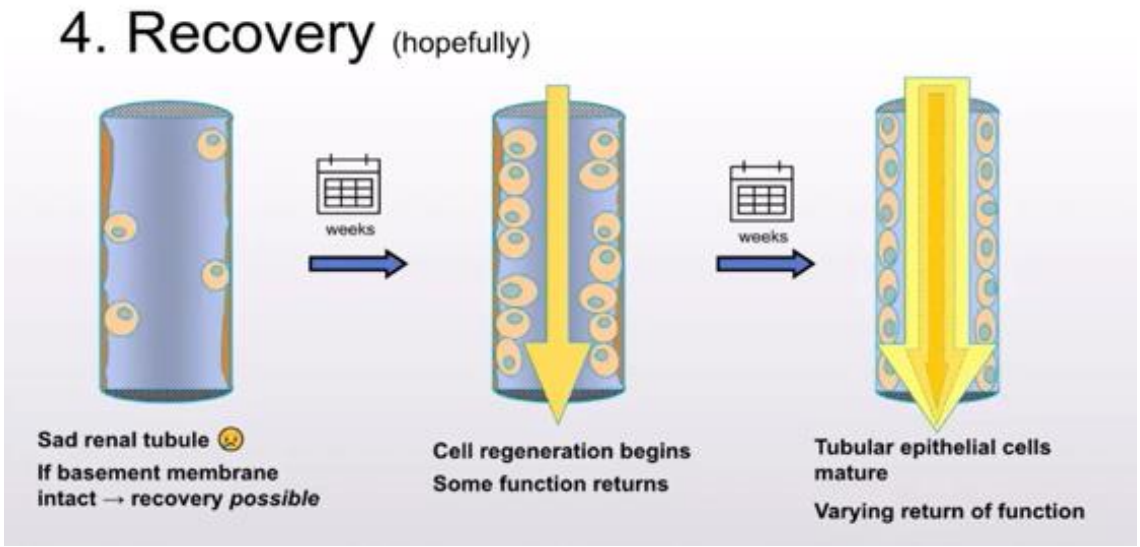
Cystatin B increased with normal functional markers



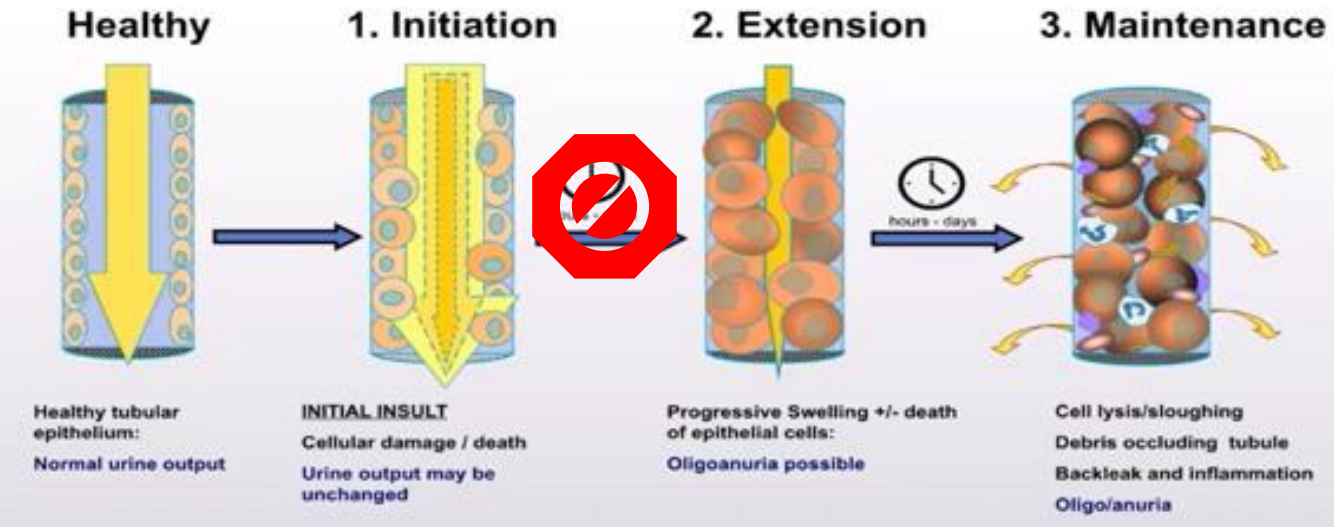
Acute injury often **subclinical** during phases 1 and 2

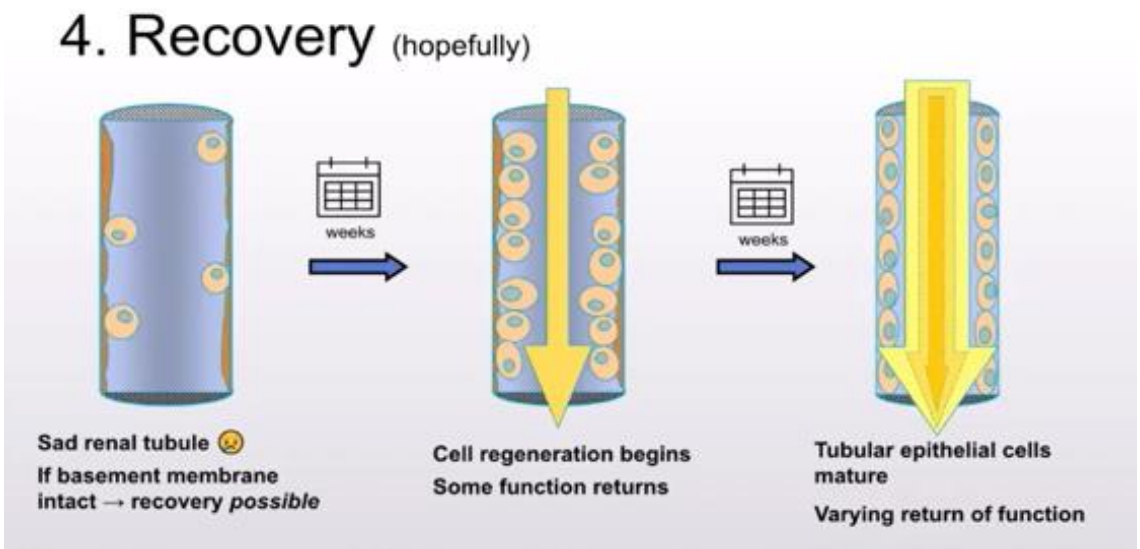
Functional markers and change in urine output appear in phase 3

Potential to affect outcome depends on early identification of AKI



Cystatin B increased in a "healthy"





Questions?