INE | INSTITUTE OF NUTRITIONAL ENDOCRINOLOGY

Blood Chemistry: Kidneys

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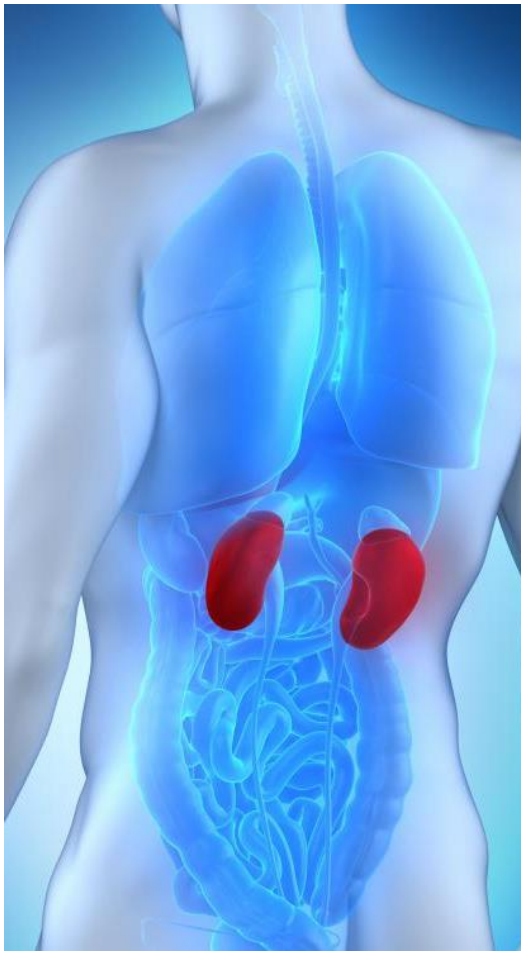
Medical Disclaimer: The information in this presentation is not intended to replace a one-on-one relationship with a qualified health care professional and is not intended as medical advice. It is intended as a sharing of knowledge and information from the research and experience of Dr. Ritamarie Loscalzo, drritamarie.com, and the experts who have contributed. We encourage you to make your own health care decisions based upon your research and in partnership with a qualified health care professional.

Kidney Panel

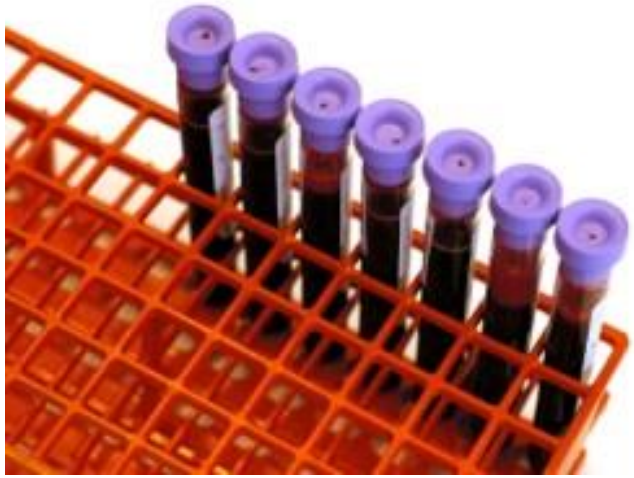
- **Blood Urea Nitrogen (BUN):** By-product of protein metabolism eliminated through the kidneys.
- **Creatinine:** A muscle breakdown product used as an indicator of kidney function.
- **Uric Acid:** Another by-product of protein metabolism eliminated through the kidneys.
- **BUN/Creatinine:** Ratio calculated by dividing the BUN by the Creatinine.
- **Glomerular Filtration (eGFR):** Provides an assessment of the filtering capacity of the kidney.



Blood Urea Nitrogen (BUN)

High

- Low stomach acid
- Electrolyte depletion
- Dehydration
- Kidney disease
- Heart attack



Low

- Malabsorption
  – i.e. Celiac and gluten intolerance
- Low stomach acid
- Steroid use
- Malnutrition
- Liver or kidney disease

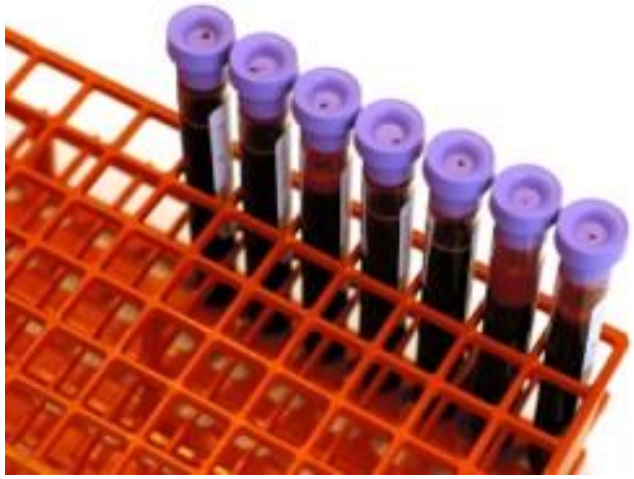
Creatinine

High

- Dehydration
- Enlarged prostate
- Kidney disease
- Muscle

Low

- Low stomach acid or inadequate protein
- Pregnancy
- Severe liver disease
- Muscle wasting



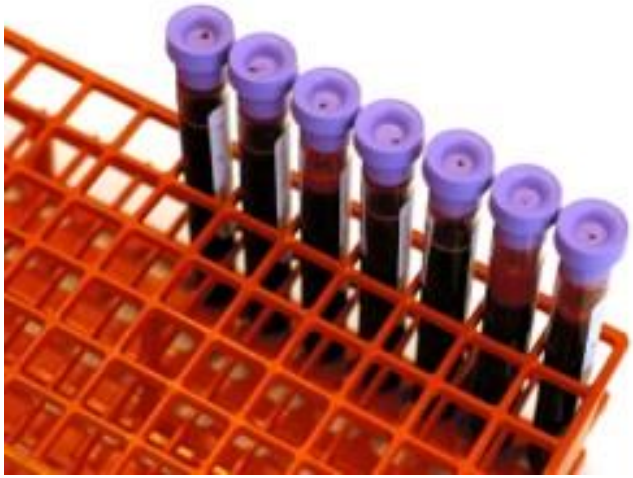
Uric Acid

High

- Gout
  - Deficiency of B6 & Magnesium
- Insulin resistance
- Diabetes
- Starvation

Low

- B12 deficiency
- Folate deficiency
- Molybdenum deficiency



Kidney Panel Case

Uric Acid, serum (Female)	mg/dL	1.8	7.0	3.2	5.5	5.9	5.1
Uric Acid, serum (Male)	mg/dL	1.8	7.0	3.7	6.0		
BUN	mg/dL	8.0	28.0	13.0	18.0	7	11
Creatinine, serum	mg/dL	0.5	1.2	0.7	1.1	0.7	0.78
eGFR	mL/min/1.73	59.0	-	59.0	-	>59	>59
eGFR (African American)	mL/min/1.73	59.0	-	59.0	-	>59	>59
BUN/Creatinine Ratio	-	8.0	27.0	8.0	27.0	10	14

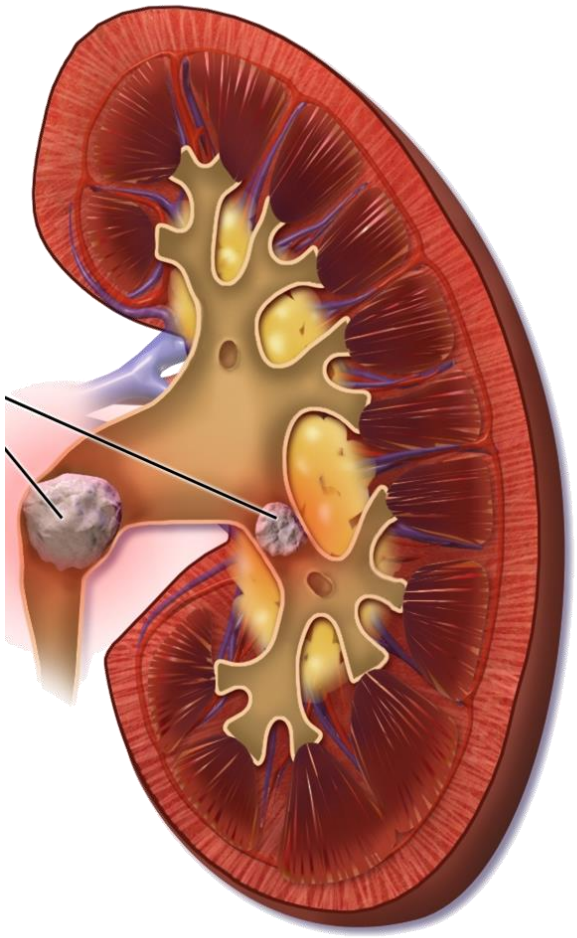
- Values below functional range in BUN, slightly lower creatinine and uric acid may be fine in vegans and vegetarians but can be indicative of malabsorption and/or low stomach acid.
- Look for other evidence in metabolic assessment and abnormal in blood minerals.
- High values indicate impaired kidney function or increased tissue breakdown.

Kidney Dysfunction Case

CATEGORIES	Units	LAB RANGE		IDEAL RANGE		DATE
Lab Markers						Results
Uric acid, serum (female)	mg/dL	1.8	7.0	3.2	5.5	8
Uric acid, serum (male)	mg/dL	1.8	7.0	3.7	6.0	
Blood urea nitrogen (BUN), serum	mg/dL	8.0	28.0	13.0	18.0	29
Creatinine, serum	mg/dL	0.5	1.2	0.7	1.1	0.5
Estimated glomerular filtration rate (eGFR), serum	mL/min/1.73 m^2	59.0	-	59.0	-	59
Estimated glomerular filtration rate (eGFR) (African American), serum	mL/min/1.73 m^2	59.0	-	59.0	-	59
BUN/Creatinine Ratio	-	8.0	27.0	8.0	27.0	58
Phosphorus, serum	mg/dL	2.3	4.8	3.5	4.0	5
Protein, total, serum	g/dL	6.2	8.3	6.9	7.4	7
Albumin, serum	g/dL	3.8	5.0	4.0	5.0	4.5
Globulin, total, serum	g/dL	2.0	3.8	2.4	2.8	2.5
Lactate dehydrogenase (LDH), serum	U/L	89.0	215.0	140.0	180.0	220
Aspartate aminotransferase (AST) (SGOT), serum	U/L	1.0	45.0	10.0	26.0	50

Kidney Marker Patterns: Renal Dysfunction

- ✓ BUN: +
- ✓ Creatinine: -
- ✓ BUN/Creatinine Ratio: +
- ✓ Phosphorus: +
- ✓ LDH: +
- ✓ SGOT: +
- ✓ Uric Acid: +



Kidney Marker Patterns: Muscle Wasting

- ✓ Creatinine: +
- ✓ SGOT: + or normal
- ✓ SGPT: + or normal
- ✓ LDH: + or normal
- ✓ CPK: + or normal
- ✓ LDH: Isoenzyme #4 and #5 +
  LDH-4: Kidney
  LDH-5: Skeletal muscle and liver
- ✓ CPK: Isoenzyme CK:MM +

Kidney Marker Patterns: Edema

- ✓BUN: +
- ✓Sodium: -
- ✓Albumin: -