

Urine Analysis.

The Health management of Urine Analysis Booklet.

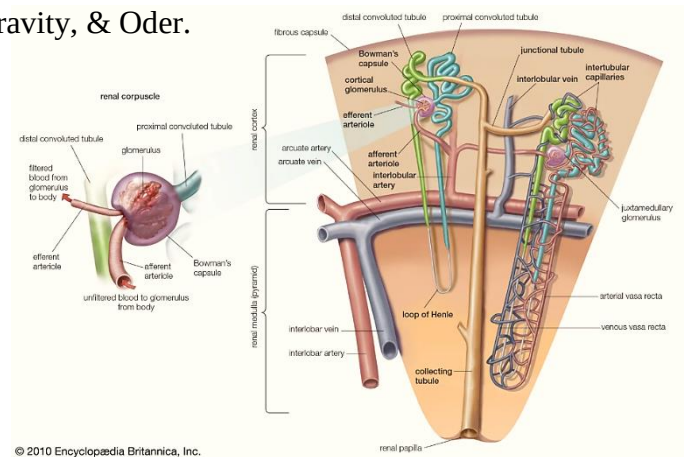
This Booklet:

1. Define the Urine analysis Diagnostic studies.
2. Interpreting:
 - A. The Indication.
 - B. Equipment.
 - C. 24hr Urine Collection
 - D. Procedure.
 - E. Normal & abnormal results.
 - F. Examination Process



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Urine Analysis.

The Health management of Urine analysis Disturbance Booklet.

Definition:

Urine analysis; is a series of tests done a Urine sample.

Indication:

Routinely:

Admitted to hospital.
Pregnant.
Pre surgical.

Diagnostic:

Abdominal, back pain.
Urine Color, smell Change.
Urinary frequency.
Unpleasant Sensation.

Screening Evaluation (monitoring):

Chronic renal disease.
Metabolic disease.

Equipment:

- Stander Precautions: Gloves, goggles, nylon Overalls & surgical mask.
- Clean bedpan, Folly Urine bag, & Urine Condom/New Urinary.
- Sterile Urine cup.
- Sticker & label.
- Tissue paper.
- Plastic bag of transport of container with specimen to laboratory.
- Also, prepare the cleaning Equipment after procedure is done. {CBR Pt}

24hr Urine Collection:

The 24hr Urine collection specimen Order.

It to collect all the urine output in a Container for 24hr literally.

The first morning duty is rejected.

The collection start by second urinary output, which the container will be labeled by it time & date of introducing the urine in. & make sure the pt identifications are there too.

The container should kept in fridge & tightly seal.

This test is aiming for the total amount protein; monoclonal proteins [Light Chains=Myeloma (bens jones protein)], Albumin [amyloidosis],



Procedure:

- 1st. Check the physicians Order.
- 2nd. Review the P&P [Equipment].
- 3rd. Do the lab label request.
- 4th. Hand hygiene.
- 5th. Prepare the Equipment.
- 6th. Ask you collages for help. [Clean the pt, positioning of pt, preparing the delivery of the specimen, calling the orderly].
- 7th. Hand Hygiene.
- 8th. Wear PPE.
- 9th. Identify the pt:
 - 1st. Pt Full 3 Part – Digit Name.
 - 2nd. Pt Room and bed ID number.
 - 3rd. Pt ID
 - 4th. Pt Date of Birth .
 - 5th. Pt Dr Name.
 - 6th. Admitting date to hospital or clinic .
 - 7th. Bracelet Tag of pt in his hand, neck, & leg.
 - 8th. Pt mother name.
 - 9th. If pt is unknown we use a name and report that name to the team.
- 10th. Provide privacy.
- 11th. Explain procedure to the patient and give him/her simple directions.
- 12th. Standard precautions. Wear the gloves, goggles, nylon overalls & surgical mask.
- 13th. Clean & wipe the pt with urogenital are with Soap and Water.
[vaginal discharge may contaminate the urine specimen]
- 14th. Slide the pan. If the pt is CBR.
The pam should be clean. Open the cup.
- 15th. Collect the midstream urine and collate at least 1/3 of the cup or to the marker cup line.
- 16th. Immediately cover the container. & rap the container seal by tissue paper.
- 17th. Label the specimen with the complete necessary information.
- 18th. Deliver to laboratory on time.
- 19th. Clean the pt./ ensure to clean him/herself well.
- 20th. Hand hygiene.
- 21st. Documentation.

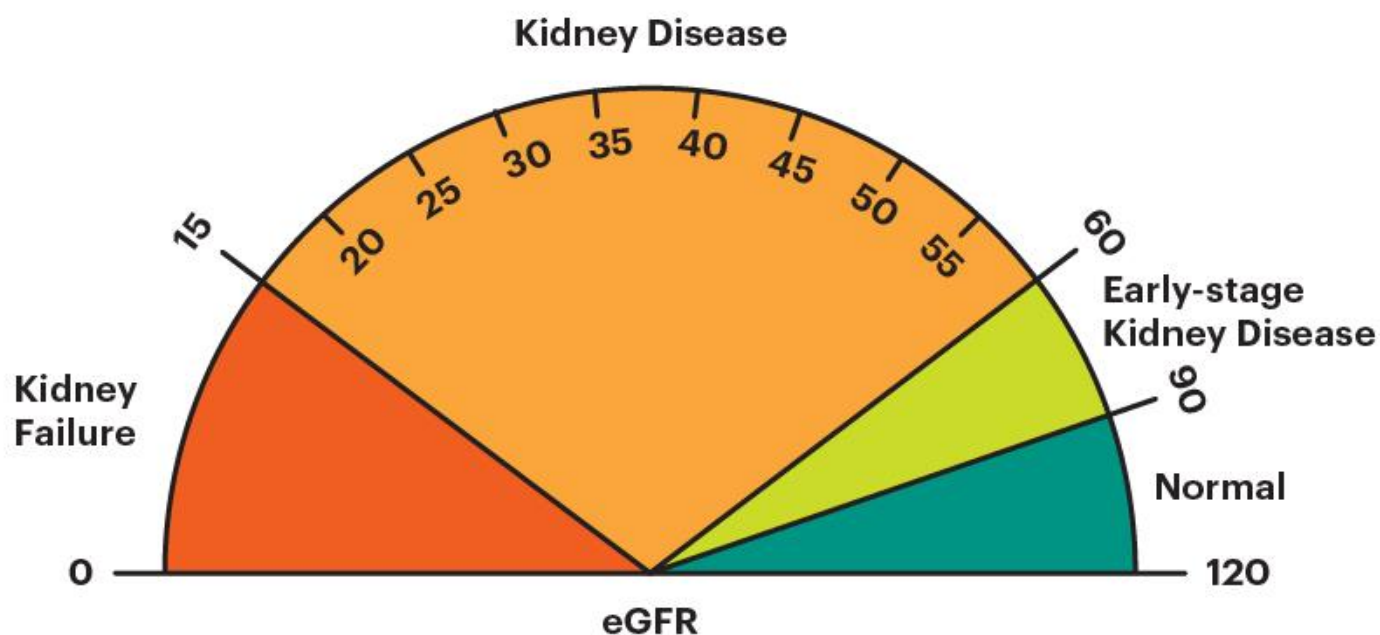
Normal & abnormal Results:

Lab Test Table 1		Normal Range	Abnormal level classification.
Urine Analysis Examination Process.	Color	Yellow	Table 2
	Clarity	Yes or no	
	Specific Gravity	1.025-1.035	
	Urine Osmolality	300-900 mOsm/kg/24hr 50-1200 /kg/random sample.	
	pH	5-6(4.5)	Table 3
	BUN	7-18mg/dl	Clearance
	Creatinine	0.6-1.2mg/dl	
	Ratio: Bun/ cr	10;1	
	Protein	Negative (less 0.15)	Table 3
		0-8mg/dl	
		50-80mg/24hr	
		< 250mg/24hr [athletic]	
	Glucose	Negative (fresh)	Dx studios for DM
	Ketone	non	Table 3
	RBCs	0-2	Hematuria
	WBCs	0-4	UTI Infection Culture recommended.
	WBCs CASTS	NONE	
	Leukocytes	negative	
	Bacteria	negative	
	Bilirubin	Null	Gallstone, Extrahepatic obstruction, liver metastasis, cholestasis.
	Urobilinogen	0.1-1.8mg/dl (1.7-30 μ mol/L)	>2 Hemolytic & Pernicious anemia Hemolysis & hematoma.
			<0.1 Biliary obstruction & cholestasis.
	Nitrites	none	UTI
	Crystals	none	Renal Stones UTI
GFR	Equal to insulin clearance 70-120ml/min	Female $((140-\text{age}) * \text{wg} * 0.85) / 72 * \text{Cr level}$	Control of Glomerular filtration rate. Studding the kidney Function. Page 7.
		Male $((140-\text{age}) * \text{wg}) / 72 * \text{Cr level}$	

Table 2	
Identification & Classification	
Color	
Transparent. Colorless urine	Over-hydration, glycosuria.
Pale straw color	Normal, healthy, well hydrated.
Transparent amber Yellow	Normal.
Dark yellow	Normal, but suggestive of mild dehydration , eating carrot
Amber or honey	Dehydrated.
Light orange	Dehydrated +liver or bile duct problems, consumed food dyes or the excretion of excess B vitamins from bloodstream
Orange	Medications jaundice.
Dark orange or brown	Jaundice, rhabdomyolysis or Gilbert's syndrome . Also caused by severe dehydration
Pink	eating beets, blueberries or rhubarb or a bigger complication
Red.	Dark: Upper urinary [kidneys], Bright: [lower]. Blood in the urine, called hematuria , idiopathic or a sign of a kidney stone, infection or tumor in the urinary tract, problem with the prostate . Gross hematuria . , eating beets
Green	Medications and food dyes produce harmless green urine too, but it can also signal a bacterial infection in the urinary tract.
Blue.	medications and food dyes produce bluish urine , inherited metabolic disorder known as familial hypercalcemia ,(blue diaper syndrome) ,
Dark brown or black.	Ingesting large amounts of rhubarb, fava beans or aloe. Medication. copper or phenol poisoning or melanoma
White or milky	Overabundance of certain minerals, such as calcium or phosphate, a urinary tract infection or excessive proteins.
Cloudy	Pus, bacteria, RBC, high fat diet, phosphate. Urine sample left in fridge more than one hr.
Urinary specific gravity (SG) 1.005 – 1.03 Measure of the concentration of solutes in the urine Measures the ratio of urine density compared with water density and provides information on the kidney's ability to concentrate urine Osmolality is normally used for more detailed analysis but USG remains popular for its convenience ^[4]	
Decreased specific gravity (hyposthenuria, i.e. decreased concentration of solutes in urine) may be associated with renal failure , pyelonephritis , diabetes insipidus , acute tubular necrosis , interstitial nephritis , and excessive fluid intake Over hydration (e.g., psychogenic polydipsia). ^{[4][5]}	Increases in specific gravity (hypersthenuria, i.e. increased concentration of solutes in the urine) may be associated with dehydration , diarrhea , emesis , excessive sweating , urinary tract/bladder infection, glucosuria , renal artery stenosis , hepatorenal syndrome , decreased blood flow to the kidney (especially as a result of heart failure), and excess of antidiuretic hormone caused by Syndrome of inappropriate antidiuretic hormone
Odor Appearance(some food asparagus)	
Fruity smell	Ketonuria
Foul	UTI
musty	Phenylketonuria
Stool	Enterovisical
Ammonia smell	Urine stand for long time
Sperm cause cloudy urine , also refrigerated urine for more than 1 hr. ,	

Table 3

Urine pH Normal pH : 4.6 – 8	
Acidic	Alkaline
Metabolic or respiratory acidosis – academia Starvation Dehydration Diet high in meat products or cranberries. Diabetic mellitus	Bacteria UTI Diet high in citrus fruits, dairy products, vegetables. Gastric suction Vomiting
Stones: Cysteine, Uric acid, calcium oxalate. Acidemia.	Stones: calcium carbonate, calcium phosphate, magnesium phosphate. Alkalemia.
Drugs: <ol style="list-style-type: none"> 1. Ammonium chloride 2. Chlorothiazide 3. Mandelic acid 	Drugs: <ol style="list-style-type: none"> 1. Bicarbonate antacids , 2. acetazolamide , 3. carbonic anhydrase inhibitors
Protein & Proteinuria. NI<0.15 Due to : Glomerulonephritis, Nephrotic syndrome, diabetic glomerulosclerosis, Nephrotoxic drug therapy , renal vein thrombosis bladder tumors , CHF ,trauma , bacterial pyelonephritis . Emotional stress , contras media , urine contaminated with prostate or vaginal secretion , diet high in protein , concentrated urine , hemoglobin	
Drugs: aminoglycosides , nephrotic , lithium , sulfonamides , vancomycin , salicylate , oxacillin , penicillin.	
Hyperproteinemia [low proteins levels in blood] will effect the oncotic pressure {interstitial edema}. Preeclampsia sign.	
Ketones. Non 0 to +4 Drugs can causes false positive Drugs: levodopa, phenazopyridine, isoniazid, parasites. If present, it called Ketonuria. Which cab be DKA. Uncontrolled DM, Starvation, alcoholism, prolong vomiting, anorexia, high protein diet, glycogen storage disease, febrile infants, hyperthyroidism, severe stress, excessive aspirin ingestion, & anesthesia.	



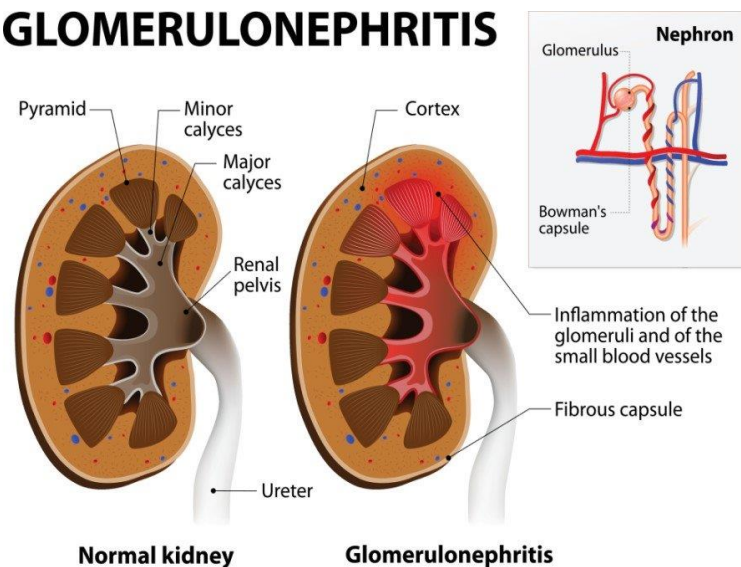
STAGES OF CHRONIC KIDNEY DISEASE		GFR*	% OF KIDNEY FUNCTION
Stage 1	Kidney damage with normal kidney function	90 or higher	90-100%
Stage 2	Kidney damage with mild loss of kidney function	89 to 60	89-60%
Stage 3a	Mild to moderate loss of kidney function	59 to 45	59-45%
Stage 3b	Moderate to severe loss of kidney function	44 to 30	44-30%
Stage 4	Severe loss of kidney function	29 to 15	29-15%
Stage 5	Kidney failure	Less than 15	Less than 15%

* Your GFR number tells you how much kidney function you have. As kidney disease gets worse, the GFR number goes down.

Table 4

Cast			
Rectangular clumps of materials or cells.			
Granular, Waxy	Fatty	Epithelial	Hyaline
UTI . Acute tubular necrosis. Glomerulonephritis. Pyelonephritis. Chronic lead poisoning. Exercise. Stress. Renal transplant rejection.	Nephrotic Syndrome. Diabetic nephropathy. Glomerulonephritis with streptococcal infection. Chronic renal disease. Mercury poisoning. Fat embolism.	Glomerulonephritis. Eclampsia Heavy metal poisoning.	Orthostatic proteinuria. Fever. Strenuous exercise. Stress. CHF. Chronic renal failure. Pyelonephritis.
RBC		WBC	
Glomerulonephritis. Subacute bacterial endocarditis. Vasculitis. Sickling. Malignant hypertension. Systemic lupus erythematosus.		Acute Pyelonephritis. Glomerulonephritis. Lupus nephritis.	
Glomerulonephritis: is inflammation and damage to the filtering part of the kidneys (glomerulus).			
Pyelonephritis: is a bacterial infection causing inflammation of the kidneys.			

GLOMERULONEPHRITIS



PYELONEPHRITIS

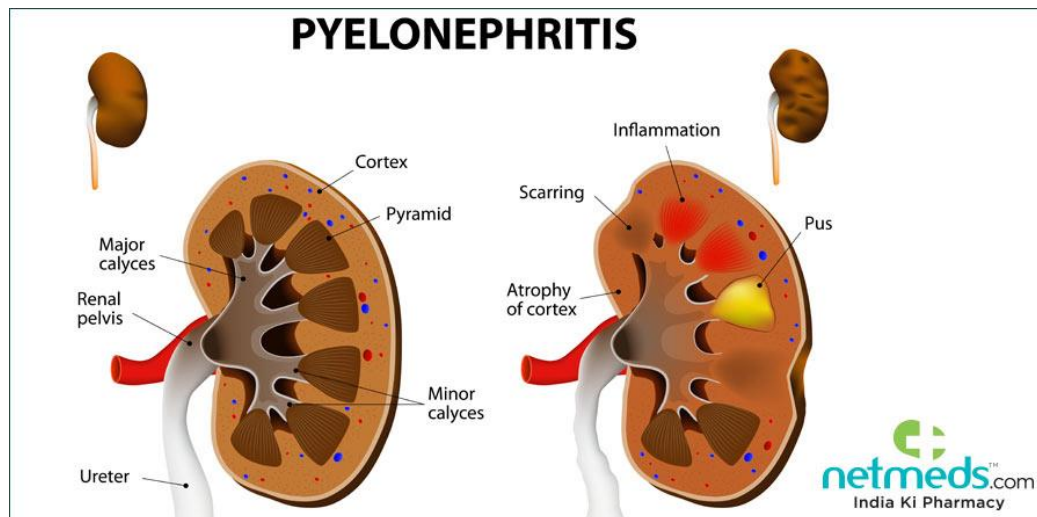
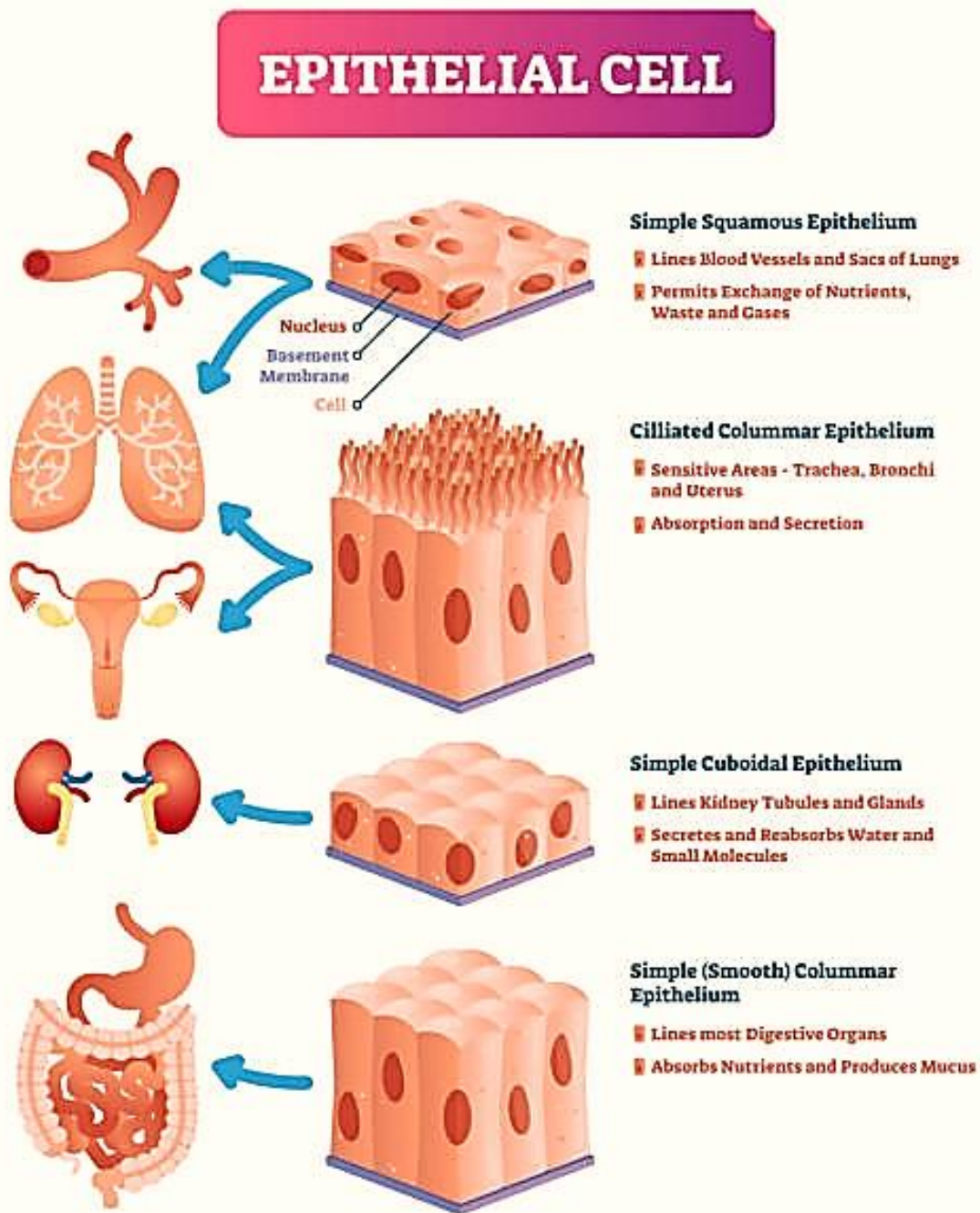
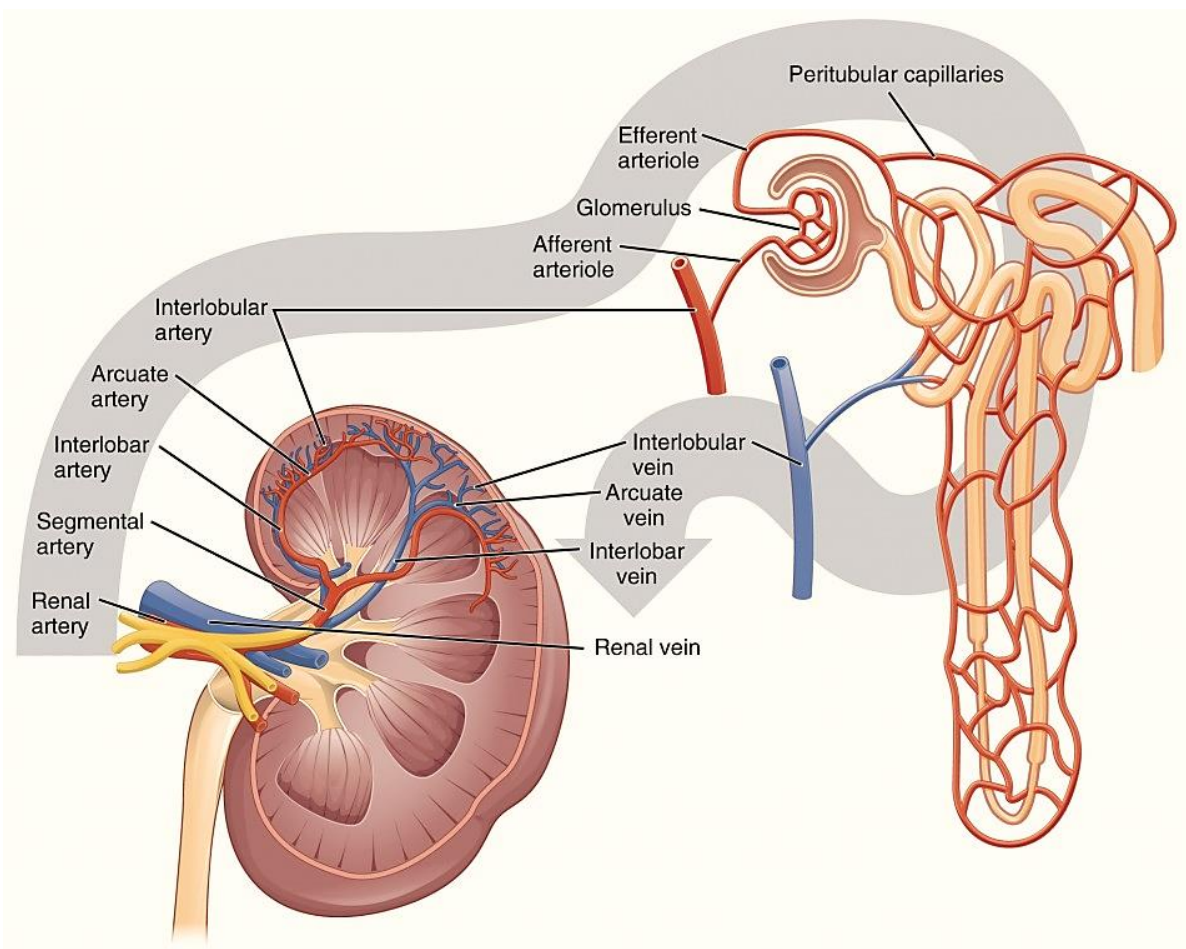
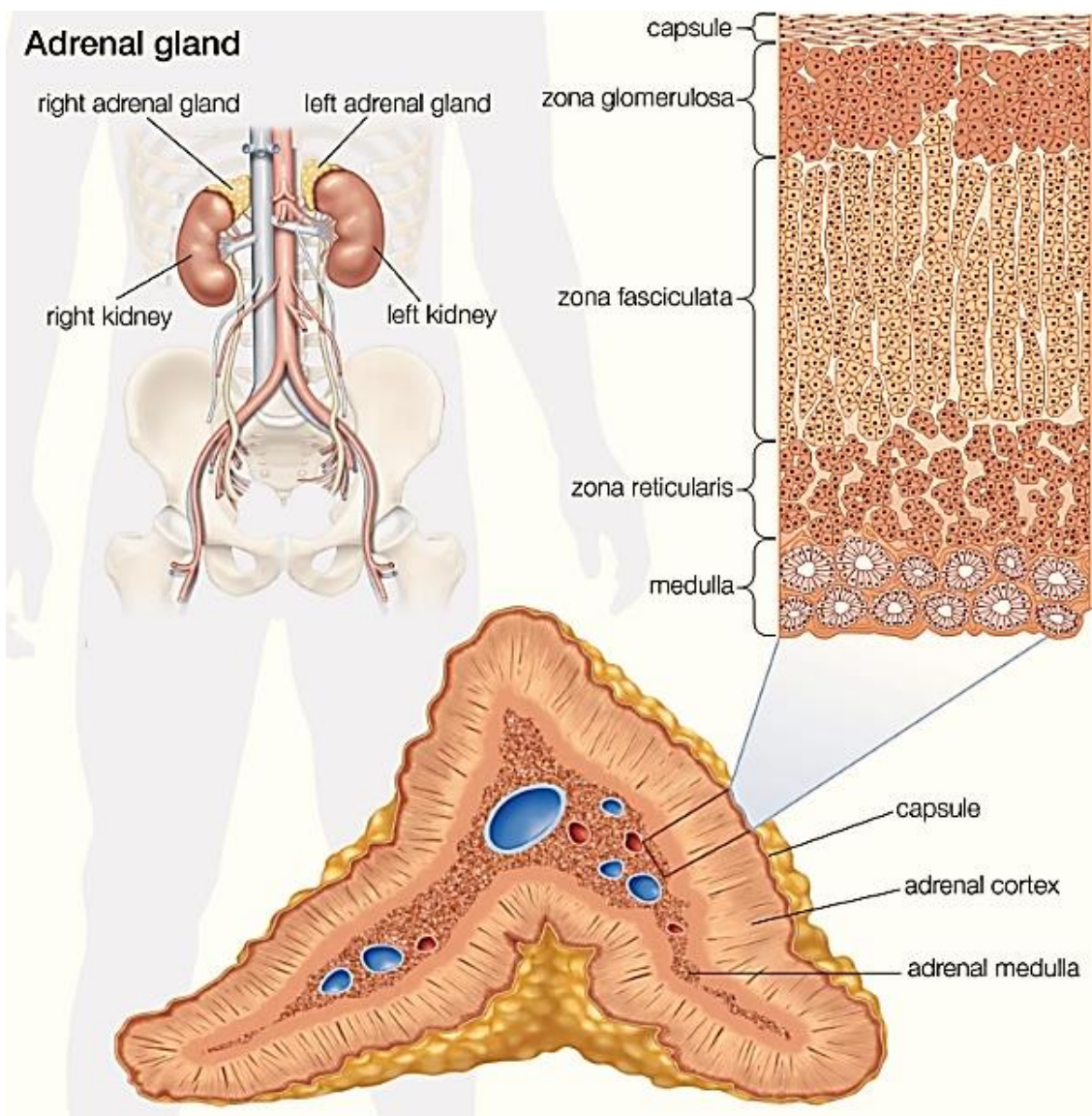


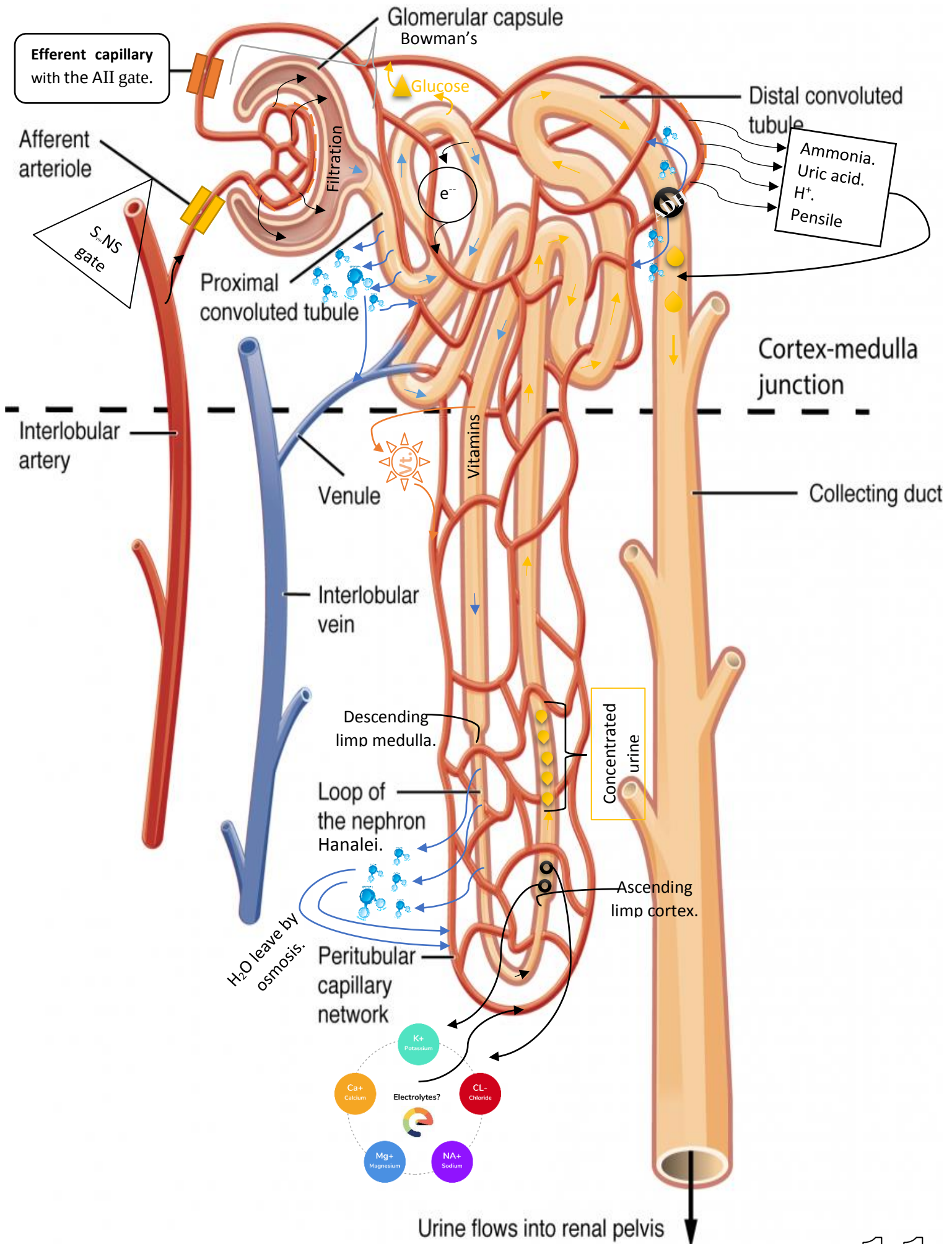
Table 5

Cells		
RBC	WBC	Epithelial
<p>Increased RBC level.</p> <ol style="list-style-type: none"> 1. Primary renal disease 2. Renal tumor 3. Renal trauma 4. Renal stone 5. Tumors bladder trauma-catheterization. 	<p>Bacterial infection UTI.</p> <p>Any Culture specimen need 2-3 days to have the results. However according to the S/S, & with taking in consideration the recommendation Infectiology [infectious disease doctors] CS the antibiotics/antiviral should be administered & treatment started.</p>	<p>Acute renal allograft rejection.</p> <p>Acute tubular necrosis.</p> <p>Acute Glomerulonephritis.</p>





Nephron Anatomy & physiology.



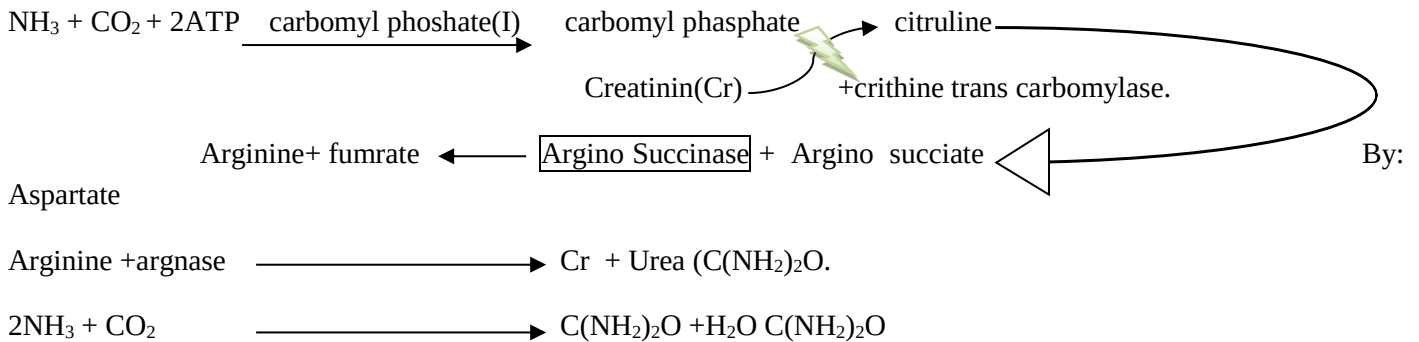
How the Urea produced in body?

Urea cycle

Krebs-Henseleit cycle

The destruction and metabolism of proteins produces ammonia acid $\longrightarrow$ free ammonia (toxic to the body). NH_3

Inside the microcondria.



Urea is only produced in the liver.

The food rich in amino acids are :

1. Soy
2. Beef
3. Tofu
4. Chicken
5. Eggs
6. Milk
7. Pork
8. Cottage cheese
9. Yogurt
10. Turkey

Cr + Urea are wastes and excrete through Voiding and sweating.

CO_2 produced by the arobic circulation.

THE 8 GOLDEN RULES

To keep your Kidneys Healthy



Keep fit and active



**Keep regular control
of your blood sugar level**



Monitor your blood pressure



**Eat healthy and keep
your weight in check**



Maintain healthy fluid intake



Do not smoke



**Do not take over-the-counter
pills on a regular basis**



**Get your kidney function checked if you
have one or more of the "high risk" factors**

a. You have diabetes

b. You have hypertension

c. You are Obese

**d. One of your parents or other family
members suffers from kidney disease**

