Lab results

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1 Urinalysis Overview

1.1 Reasons for ordering Urinalysis

2 Screening tests

Diagnostics tests
Management Tests

Indications of a urinalysis

- Infections
- Almost any metabolic disorder
  Specifically for kidney disease
- Gall Bladder disease

- Malignancy
- Pregnancy
- Liver Dysfunction
- General screen for anything

2.1 UA Findings

2.1.1 Acetones (Ketones or ketoacidosis)

These are breakdown products of fat metabolism.
It is normally negative in the urine.

Present When
- You are burning more fats the physiologically normal

If present
- The first thing to suspect is diabetes (if not on a weird diet)
- If they are pregnant, suspect pre-eclampsia or eclampsia. (You are developing high blood pressure, edema, bloating)
- If they are starving or on a bizarre diet.
- If the patient is anorexia
- Cachexia (wasting away – usually cancer)
- Pro-longed vomiting.

2.1.2 Addis count

Addis count is a 24 hour collection that looks for an increase in the number of WBC's, RBC's, and casts
If elevated suspect

Comment – it's almost worthless because of the variation from patient to patient. If it's only a 12 hour test, it completely useless.

2.1.3 Aldosterone

A mineral corticoid. (a steroid made by the adrenal cortex that regulates the balance of sodium, potassium, chloride, and bicarbonate – maintians the levels of the minerals)
It will make you maintain sodium, bicarbonate, make you excrete potassium and hydrogen ions.

Normally this should be negative. In a 24 specimen you should find a trace.

If you retain sodium you are retain water.
If you retain bicarbonate you have a higher pH

If elevated
- You are going to suspect malignant hypertension or heart failure.
- Kidney and liver disease

If decreased

- Alcoholism
- Addison's disease
- If pregnant eclampsia or pre-eclampsia
- Liver or kidney disease

2.1.4 Amylase

Amylase is an enzyme for breaking down starch into smaller molecules.
Amylase breaks starch into dextrins.
Dextrin get broken down into disaacrides.
Carbohydrate break down starts in the mouth.
Protein breakdown starts in the stomach
Lipids start in the duodenum

In a 24 hour sample, a small amount should be present.
If elevated

- Pancreatic problems (pancreatitis)
- Kidney disease
- Gall bladder disease

If decreased

- Alcoholism
- Liver disease
- Pancreatic disease

2.1.5 Occult Blood

Two types of blood, that which you can see, and that which you can't seen.
Occult blood is the blood you cannot see. It is the hemoglobin in the urine.
If present

- If female – is she having her period.
- Strenuous exercise always cause blood in the urine. This is normal
- Any type of urinary tract infection with bleeding.

After ruling out the above look for

- Patient on blood thinners
- Bacterial endocarditis
- Overdose of aspirin
- Scurvy
- Malaria
- TB
- Some kidney disease

Look for the normal before you look for the abnormal

2.1.6 Calcium (cation)

Done on a 24 hour collection.
Major mineral on the bone and in the body.

Needed for nerve conduction and (heart and general) muscle contraction.
Needed for blood clotting.
Not normally found in a random sample.
If elevated

- Vitamin D intoxication
- Multiple myoloma (a form of leukemia, associated with monocytes) The bones become weakened and appear in xrays to have holes punched in them.
- Autoimmune disease called sarcoidosis.
- Acidosis of the body
- Metastatic cancer
- Hyperparathyroid problem

If decreased

- Hypoparathyroidism
- Kidney problems
- Look for Osteomalacia (soft bones)
- Chronic Kidney disease

2.1.7 Cast

A mold – a form.
A residual of sluggish movement.
A building up of protein or other sediment in the tubular system of the kidney, bladder, and urinary system. It keeps the shape of the tube in which it was formed.
This occurs after the filtering.
You actually look at it under the microscope.

- Hyaline Cast – A protein cast, almost transparent.
- Epithelial Cast – Decayed epithelial tissue that forms a cast.
- RBC Cast – Made of degenerated RBC's. Mostly hemoglobin.
- Fatty or Waxy Cast – A build up of lipid materials.
- Leukocyte Casts – Made up of WBC's. Likely associated with some kind of infection.
- Bacterial casts – made up of bacteria. Secondary to a bacterial infection of the kidney.

Casts in small numbers isn't a real problem. If found in large numbers, they are pathological.

2.1.8 Catecholamines

They are defined as a group of amino acids that do the same thing as the sympathetic nervous system. (it acts instead of the normal neurotransmitter chemical)
They are made by the adrenal gland.
They can be present in vary small amounts.
Done on a 24 hour collection.
If elevated there can be lots of reasons.

- If you have to pick an organ, pick the adrenal gland because it makes them.
  There is a proper zinc to copper ratio. If the zinc to copper ratio is less than 5 to 1, then it is abnormal. It means you have an elevated catechollamines.
- Elevated catecholimines are related to a zinc to copper ratio of less than 5 to 1.

- Anything that gives you a rush (excess stimulation, coffee for example)

If decreased:

- Sympathetic not as active as it should be. Autonomic Nervous system problems.
- Postural hypotension. (you get up too fast)
- Feinting.
- Vertigo
- Zinc –copper ration above 10 to 1.

2.1.9 Chloride

Extra-cellular anion (along with sodium cation)
Maintains osmotic pressure
If elevated:

- Elevated chloride blood levels.
- Look for elevated chloride ingestion (food, salt, medications)
- Metabolic - State of acidosis (blood pH lower)
- Kidney problems (perhaps liver problems)

If decreased

- Go with Addison's disease
- Kidney disease
- Starvation
- Pneumnia
- Excess sweating, or excess vomiting.

2.1.10Creatine

Creatine a storage form energy used in the muscles. When it is "burned" you have a waste product called Creatinine.
Elevated levels

- Normal elevation is associated with skeletal and cardiac muscle disease.

If Decreased

2.1.11Creatinine

Elevated are of little diagnostic value
Decreased

- Kidney disease
- Any type of urinary tract obstruction.

2.1.12Cysteine

Done on a 24 hour specimen
It is non-essential.
If found in the urine think kidney disease.
More importantly think of the possibility of hereditary defect in the kidney.

2.1.13Glucose

Hexose sugar of choice for all organisms on the planet.

Urine level correlates well with the serum glucose level.
If the blood glucose is lower than a certain level, no sugar will be "spilled". If it is above a certain, the kidneys will start to spill glucose. This level is different from person to person.
Should use second voiding of the day.
Urine cannot sit for an extended period of time because bacteria will start to eat any glucose in the urine.
If present think

- Diabetes
- Chronic liver disease
- Excess sugar ingestion
- Emotional Distress (stress in general – physical tends to burn it however…)
- Other things
  A problem with increased CSF pressure

  Hyperpituitary gland (like false diabetes)

  Heavy Metal Poisoning

  Hyperthyroidism

  Pregnancy

2.1.14LDH (Lactic Dehydrogenase)

An enzyme found in almost all cells. It is related to the Krebs cycle
There are five isoenzymes which means that there are five different types of LDH.
If elevated/decreased

- Kidney Disease
- Liver Disease
- Cancer in the bladder or prostate
- Myocardial Infarction
- With almost any type of cell damage

2.1.15Lead

A heavy metal. It is always toxic.
General elevated in prolonged environmental exposure.
In a child, it can come on much quicker.
Usually in mcg/L, toxic levels are mg/L

2.1.16Lipid

Lipurea may be present in

- Carbon monoxide poisoning
- Chronic pancreatitis
- Liver disease
- Pregnancy
- Severe Diabetes
- Malabsorption syndrome

- Malnutrition

2.1.17pH

Stands for potential hydrogen.
Neutral is 7.
Blood is normally 7.4
Urine is slightly acidic normally
Alkaline blood pH – alkosis (above 7.45)
Acidic blood pH – acidosis (below 7.35)
Low urine pH

- Probably blood acidosis
- Rheumatism
- Diabetes
- High protein diets
- Lots of cranberry juice

High Urine pH

- Probably blood aklosis
- Antacids
- Vomiting
- Fanconi's Syndrome
- Diet high in dairy products
- Diet high in citric fruits

2.1.18PSP Excretion Test

Phenolsulfonpthalein – a red dye injected into the blood stream. It is injected into the body and then measured over time to measure how much has been excreted. It is assumed that if it is not all excreted, then it is assumed that the bladder is not being completed voide
Increased excretion seen with (quicker than normal):

- Liver damage
- Hyperthyroidism
- High blood pressure

Decreased excretion seen with:

- Kidney problems
- Congestive heart failure
- Gout

2.1.19Porphyrins

A byproduct of heme formation. (The heme in hemoglobin)
The term porphyria means –
There are a number of different porphyrins.
There are some general comments

- Organs that may be
-
- If given the choice a

2.1.20Protein

Proteins don't make it through the kidney normally.
Any amount is considered to be bad. A small amount on 24 hour collection.
The largest of the macro molecules in our diet.
Proteinurea – protein in the urine
Albumin – usually the one found. Albuminurea – almost synonymous with proteinurea.
Globulins –
Fibrin -
Increased levels may be related to

- Kidney disease
- Congestive heart failure
- Pregnancy w/ eclampsia and pre-eclampsia – this is the screening test.
- Hyperthyroidism
- Acute bacterial infections.
- Other things
  Liver disease

  Kidney stones

  Emotional stress

  Physical trauma

  Multiple Myoloma (leukemia of monocytes – starts to destroy the bones. Giving the bones a "punched out" appearance to the bones on an xray. Considered a bone disease.) Bence-Jones protein is associated with multiple myoloma and is found in the urine. It is NEVER normal to have Bence-Jones protein.

2.1.21Specific Gravity

Refers to amount of dissolved material in a liquid. The more substance, the more things will float in the liquid.
Distilled water is defined to be 1.0
Range of normals: 1.003 – 1.035
A more normal range is something like 1.015 – 1.025

Mainly measures the ability of the kidney to concentrate urine.
High Specific gravity

- Diabetes – (all that sugar)
- Inflammation of glomerulus (acute kidney condition)
- Dehydration/Sweating
- Sick and vomiting a lot

Low Specific Gravity

- Chronic Nephritis – too much is reabsorbed – some type of chronic kidney disease
- Diabetes Insipidus – no/little antidiuretic hormone being produce– you are dumping huge amounts of urine. (posterior pituitary)
- Elevated fluid intakes
- Restricted salt diet

2.1.22Urobilinogen

A colorless compound form in the intestine from the breakdown of bilirubin. Breakdown is caused by bacteria. Some of it is excreted, some is reabsorbed and excreted through the kidneys.

Urobilin – oxidized form of urobilinogen

- Increased: from excessive red blood cell breakdown, eclampsia, congestive heart failure (or can decrease)
- Decreased:
- If both are increased without any hemolytic red blood cell disease automatically assumes some type of liver infection.

Urobilinogen – formed in the liver.

- Increased: From excessive red blood cell breakdown or malaria
- Decreased concentrations from acidified urine, severe diarrhea, kidney insufficiency, cancer of the head of the pancreas.

Test

- Open book – get book that day
- 30 questions