Austin Community College
MLAB 1211 Urinalysis/Body Fluid
Unit 3 Objectives

Part 1 – Overview of the chemical examination of urine

1. Demonstrate the proper technique for performing urine reagent dipstick testing.
2. State the normal values for the chemical dipstick on a urine.
3. Evaluate the significance of each of the following chemical constituents of a urine sample: glucose, ketones, bilirubin, blood, pH, leukocyte esterase, protein, urobilinogen, and nitrites.
4. Review sources of error in the handling of urine reagent dipsticks.
5. Explain how time delays have an effect on the chemical testing of urine.
6. Identify the indicator used in urine dipsticks to determine urine pH.

Part 2 – Carbohydrates

1. Describe the storage form of glucose found in the liver and muscle.
2. Describe the pathway of glucose as it is filtered and reabsorbed in the nephron in normal/abnormal concentrations.
3. Describe the renal threshold concept.
4. Define glycogenesis, glycogenolysis, and glycosuria.
5. Explain the chemical reaction of glucose on the urine dipstick.
6. Explain how reducing substances affect glucose chemical testing on urine.
7. Explain the significance of the Clinitest procedure.
8. Describe the pass-through phenomenon of the Clinitest procedure.

Part 3 – Ketones

1. Identify the three ketone bodies produced by the human body.
2. Describe how the ketone bodies are produced in excess.
3. Describe the reactive component used in the urine dipstick for ketones.
4. State two reasons each for false negatives and false positive results in urine ketone testing.
5. Explain the purpose of the Acetest tablets.
6. State the effects that ketonuria, ketonemia, ketosis, acidosis, and ketoacidosis have on the human body.

Part 4 – Protein

1. Identify the protein that gives a positive protein result on the urine dipstick.
2. Define proteinuria.
3. Explain the importance of detecting orthostatic proteinuria.
4. Discuss the significance of Tamm-Horsfall protein.
5. State the significance of Bence-Jones protein.
6. Summarize the principle of the urine dipstick reaction for protein.
7. Evaluate four sources of error that may affect the urine dipstick method for protein.

Part 5 – Bilirubin and Urobilinogen

1. Describe the formation of bilirubin, urobilinogen and stercobilinogen.
2. Compare direct and indirect bilirubin.
3. Define jaundice and urobilin.

4. Describe the confirmatory test used for a positive bilirubin urine dipstick.
5. Identify the major reactive component of Ehrlich's reagent.

Part 6 – Blood, nitrite, leukocyte esterase, specific gravity and ascorbic acid

1. Explain the significance of blood in a urine sample.
2. Discuss the principle of the blood portion of the urine dipstick.
3. Differentiate red blood cells, hemoglobin, and myoglobin as to their original in a urine specimen.
4. Explain the dipstick principle for the nitrate testing.
5. Explain why a negative test does not rule out a urinary tract infection (UTI).
6. Explain the principle of the leukocyte esterase dipstick test.
7. Explain the significance of a positive leukocyte esterase dipstick test.
8. Describe how specific gravity is determined on the urine dipstick.
9. State why testing for the presence of ascorbic acid in urine is significant.
10. State how urine dipsticks tests are affected by ascorbic acid.

Part 7 Automated Urinalysis, kidney function tests, and other renal disorders

1. State the reflectance photometry and automated microscopy principles of urinalysis instruments.
2. Describe the method used by the Sysmex UF-100 and the IRIS automated UA systems.
3. Compare upper and lower urinary tract infections.
4. Describe the physiology, symptoms, and urinalysis results for patients with diabetes mellitus, diabetes insipidus, hepatitis, urinary tract infections, galactosuria.
5. Describe the significant clinical symptoms, etiology and characteristic urinalysis findings for UITs.
6. Analyze patient urinalysis and correlate results with suspected diagnosis.
7. Identify renal function tests used to evaluate glomerular filtration, tubular reabsorption/secretion functions, and renal blood flow.