



URINALYSIS

A urinalysis is an examination of the urine by physical or chemical means. Urinalysis comprises a battery of chemical and microscopic tests that help to screen for urinary tract infections, renal disease, and diseases of other organs that result in abnormal metabolites (break-down products) appearing in the urine.

HOW THE TEST IS PERFORMED

CHILD OR ADULT:

Collect a "clean-catch" (midstream) urine sample. To obtain a clean-catch sample, men or boys should wipe clean the head of the penis. Women or girls need to wash the area between the lips of the vagina with soapy water and rinse well. As you start to urinate, allow a small amount to fall into the toilet bowl (this clears the urethra of contaminants). Then, in a clean container, catch about 1 to 2 ounces of urine, and remove the container from the urine stream. Give the container to the health care provider or assistant.

INFANT:

Thoroughly wash the area around the urethra. Open a urine collection bag (a plastic bag with an adhesive paper on one end), and place it on your infant. For males, the entire penis can be placed in the bag and the adhesive attached to the skin. For females, the bag is placed over the labia. Place a diaper over the infant (bag and all). Check your baby frequently and remove the bag after the infant has urinated into it. For active infants, this procedure may take a couple of attempts -- lively infants can displace the bag, causing an inability to obtain the specimen. The urine is drained into a container for transport back to the health care provider.

The tests should be performed within 15 minutes after the urine is collected. Various tests can be conducted from the sample. Most of the screening urinalysis tests are measured by a reagent "dipstick" which contains little pads of chemicals that change color when they come in contact with the substances of interest. There are several types of reagent strips, and it depends on the type of strip as to what tests can be performed.

The urine can also be analyzed in the laboratory.

GROSS AND CHEMICAL EXAM

- Urine appearance and color (for example, clear, cloudy, turbid, layered; pale yellow, dark yellow, red, green, blue)
- Bilirubin - urine (a degradation product of hemoglobin)
- Glucose (a sugar) -- see glucose - urine
- Hemoglobin (an indication of hemolysis)
- Urine ketones (a by-product of fat metabolism and present in starvation and diabetes)
- Nitrite (an indication of urinary tract infection)
- Urine pH (the acidity or alkalinity of the urine)
- Urine protein
- Urine specific gravity (that is, how concentrated or dilute the urine is)
- Urobilinogen (a degradation product of bilirubin)

MICROSCOPIC EXAM:

- Bacteria and other microorganisms (not normally present) or see urine culture (clean catch)
- Casts
- Crystals
- Fat
- Mucous
- Red blood cells (an indication of damage to the tubules)
- Renal tubular cells
- Transitional epithelial cells
- White blood cells (an indication of urinary tract infection)

HOW TO PREPARE FOR THE TEST

Collect a urine sample. The first morning urine is the most concentrated, and it is more likely to show abnormalities. Some drugs and medications can affect the test. These will be monitored or discontinued.

If the collection is being taken from an infant, a couple of extra collection bags may be necessary.

HOW IT FEELS

The test involves only normal urination, and there is no discomfort. There are no risks involved.

WHY THE TEST IS PERFORMED?

This may be done as a general screening to check for early signs of disease. It may also be used to monitor diabetes or kidney disease. It may be used to check for a urinary tract infection or blood in the urine.

NORMAL VALUES:

- Normal urine may vary in color from almost colorless to dark yellow. Some foods (like beets and blackberries) may color the urine red.
- The urine specific gravity ranges between 1.006 and 1.030 (higher numbers mean a higher concentration). The specific gravity varies depending on the time of day, amount of food and liquids taken, and the amount of exercise that has been obtained recently.
- The urine pH is also influenced by a number of factors. Generally the normal pH range is from 4.6 to 8.0, with an average of 6.0.
- There is usually no detectable urine glucose, urine ketones, or urine protein.
- There are usually no red blood cells in urine.
- Hemoglobin is not normally found in the urine.
- Bilirubin is normally not detected in the urine. There may be a trace of urobilinogen in the urine.
- Nitrites and white blood cells (leukocytes) are not normally present in the urine.

WHAT ABNORMAL RESULTS MEAN:

URINE APPEARANCE AND COLOR

If the urine is of an unusual color that cannot be accounted for by food intake or medication (and the urinalysis is positive), consult the health care provider.

URINE SPECIFIC GRAVITY

If the specific gravity is higher or lower than the normal range, or if it does not vary (the concentration of the urine depends on the time of day, the amount of food and fluids you have had, and the amount of exercise you have had recently), it may indicate a kidney problem, and you should consult the health care provider.

URINE PH

In some situations, an alkaline urine is good. Kidney stones are less likely to form and some antibiotics are more effective in the alkaline urine. There may be times when the acidic urine may help prevent some kinds of kidney stones and may prevent growth of certain types of bacteria. If the pH is very acidic or alkaline, you may want to discuss it with the health care provider.

URINE SUGAR

When blood levels of glucose are very high, some of the glucose may show up in the urine. The glucose and the ketones tests are usually done together. Large amounts of ketones may be present in uncontrolled diabetes. Consult the health care provider.

URINE PROTEIN

Finding protein in the urine is probably the best test for screening for kidney disease, although there may be a number of causes for an increased protein level in the urine. Consult the health care provider.

When blood is found in the urine, it may indicate a urinary tract disease or bleeding from the kidneys. However, the cause may also be vigorous physical exercise. If there is no association between exercise and the positive blood findings, consult the health care provider.

Bilirubin in the urine is a sign of a liver or bile duct disease, and you should consult the health care provider. Urobilinogen is found in small traces in the urine. If there are large amounts, you should discuss it with the health care provider.

Nitrites and white blood cells are an indication that a urinary tract infection is present, and you should contact the health care provider.

Any Vitamin C that the body does not need is excreted in the urine. If there are measurable amounts of Vitamin C in the urine, it may interfere with the other urine tests. One may receive false positives and false negatives on the results.

SPECIAL CONSIDERATIONS

If performed as a home test and there is impairment with color vision, someone else will need to read the test results. Home test results are compared to color charts.

Some drugs change the color of urine, but do not indicate disease. Some of these are chloroquine, iron supplements, levodopa, nitrofurantoin, phenazopyridine, phenothiazines, phenytoin, riboflavin, and triamterene.

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