



A monthly series of quick reference guides to tear out and keep. Whether you are a student nurse, need to update your skills or are teaching others the guides will be a useful aid to your practice

Urine testing

Urine testing using reagent strips is a simple, non-invasive, reliable method of finding potential signs and symptoms of a number of diseases in their early stages. Urine testing can be carried out easily in the home, GP surgery or hospital setting.

1. COLLECTING THE SPECIMEN

The specimen collection procedure should be explained to the patient clearly and appropriately, taking into account his or her level of understanding and knowledge of medical language. This helps to ensure that the sample is collected properly, a crucial factor in obtaining accurate results.

- When collecting specimens, nurses should be aware of the differences in cultural attitudes towards handling and collection of body fluids, and should be sensitive to any wishes the patient might have.
- The patient's privacy should be maintained at all times during the procedure.
- The person carrying out the procedure should wear non-sterile gloves for his or her own protection and to prevent cross-contamination of the specimen.
- The patient should be given the appropriate container for sample collection. This will be determined by how mobile the patient is, as well as the type of sample required (ie. for testing on site, or for laboratory testing). A commode or bedpan, with a sterile container placed inside, might be required. Children may require assistance to hold a clean container, and parents with babies should be provided with appropriate collection bags.
- If a mid-stream specimen of urine is required, a nurse may need to be present to collect the sample appropriately.
- All patients should be offered hand-washing facilities after the sample has been collected.

If a catheter specimen is required, the patient's privacy and dignity must still be maintained. To obtain a catheter specimen, use a sterile needle and syringe, wearing gloves at all times during the procedure. Clean the coloured cuff, found on the tubing of the catheter bag, with an alcohol swab. Insert the needle into the cuff and withdraw the plunger to collect the specimen. Then withdraw

the needle and clean the cuff again with an alcohol swab.

Specimens should never be taken directly from the catheter bag as urine in it may have been standing for several hours.

2. OBSERVATIONS

It is useful to observe the urine before testing it with the reagent strip because its colour and odour can indicate disease.

COLOUR

In its normal state, urine should be straw coloured and clear. Cloudiness or debris may indicate an increase in the number of abnormal cells, indicating the presence of disease.

ODOUR

Freshly voided urine has practically no smell. Urine left standing for several hours has a slight smell of ammonia. Infected urine has a 'fishy' smell. Ketoacidotic urine (urine with a high level of ketones present causing acid imbalance), or urine from anorexic patients, has a sweet 'peardrop' odour.

TESTING WITH REAGENT STRIPS

Manufacturers produce single test strips to test only for, for example, the presence of glucose or protein or blood (Table 1). Or one strip with multiple reagent areas can be used to test for several substances.

Follow the manufacturer's instruction relating to storage and use of reagent strips. Slight differences might exist between strips from different manufacturers. Usually, the strips must be stored in the container provided, and kept dry using the desiccant (drying agent) provided in the storage bottle.

Check the expiry date on the bottle before using any strips. ►

Urine testing

► Note any medications the patient is taking at the time of the test. Some preparations can alter the colour of urine, as well as reagent reactions. Beetroot may colour urine red.

3. TESTING USING A STRIP

- Dip the strip into the urine. Fluid should be allowed to cover all the reagent areas on the strip. Any excess urine should be wiped off on the edge of the specimen container.
- Lay the strip flat, on a dry surface, to prevent urine from the reagent areas mixing together.
- Observe the reagent area(s) during the recommended reaction time. Manufacturers recommend time to reading for each type of test (eg. between 1-2 minutes for protein) and this should be followed. Changes on the reagent test area after this time may not have any diagnostic meaning. Use a watch to ensure each reading is taken accurately.
- Compare the colour of reagent areas on the strip

with the colour chart provided on the side of the bottle to read the results, once the recommended time has elapsed.

- All test results should be recorded in the appropriate patient documentation at the time of testing. This is an important stage of the process because the results form an integral part of holistic patient care. Inform the nurse in charge or doctor of any abnormal results.
- Dispose of the urine in a toilet once testing is complete.

Examples of diseases for which urinalysis can show early signs and symptoms:

- Liver disease
- Renal disease
- Diabetes mellitus
- Hypertension
- Pre-eclampsia
- Biliary disease
- Renal stones
- Malignant tumour

Table 1. Urinalysis: substances which can be screened for

<i>Substance</i>	<i>Indication</i>
Protein	A morning specimen is best for detecting abnormal levels of protein, which may indicate hypertension, pre-eclampsia, glomerulonephritis, infection, or diabetes. Normal urine has a low level of albumin
Blood	Presence may indicate infection, renal stones, injury to the urinary tract or kidneys, or malignancy. Blood is not normally present in urine
Ketones	Are produced by the breakdown of fatty acids. Can be indicative of uncontrolled diabetes or anorexia
Nitrite	Optimal results are obtained from first morning specimen of urine, or urine passed four hours after the last voiding. Indicative of infection. Not normally present
Glucose	Present if renal absorption is abnormal, or patient has raised blood glucose levels. Not normally present in urine
Urobilinogen	Small amount normally present, but elevated levels indicate hepatic abnormalities or red blood cell breakdown
Bilirubin	May indicate biliary disease. In conjunction with raised levels of urobilinogen, may indicate hepatic disease

Further reading

Cook R (1996) *Urinalysis: ensuring accurate urine testing. Nursing Standard. 10, 46, 49-54.*
 Royal Infirmary of Edinburgh NHS Trust (1997) *Manual of Clinical Practices. Core Elements of*

Care: Diagnostic Interventions. Edinburgh, RIE.
 Thompson J (1991) *The significance of urine testing. Nursing Standard. 5, 25, 39-40.*