

# How to perform a urinalysis

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[[HEADER SECTION]]

Clinical skills

How to ..... Perform a Urinalysis

[[SUMMARY SECTION]]

### *Rationale*

This article is written to ... Help you undertake a urinalysis in a safe, timely, effective and patient centred manner, ensuring privacy and dignity. Urinalysis is a commonly performed clinical procedure to detect problems within the body that can appear in the urine.

- Urinalysis should be undertaken by competent health care practitioners
- Urinalysis is a simple cost effective tool which may be performed for the purposes of screening, diagnosis and management, as urine may undergo several changes as an individual becomes unwell.
- Urinalysis is considered a fundamental component of the holistic and symptom assessment of any individual in poor health.
- The healthcare practitioner needs to explain the procedure to the patient
- The healthcare practitioner must document all relevant findings

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[[MAIN TEXT SECTION]]

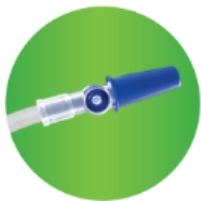
### Preparation and equipment

The healthcare practitioner needs to have an understanding of the rationale for undertaking the urinalysis and be able to explain the correct procedure for collecting a urine sample to the patient and or their carers. The healthcare professional should be aware of the local policy for personal protective equipment (PPE) such as gloves and aprons, and the correct procedures for handling potentially hazardous biological agents such as urine.

All samples should be midstream and collected in a sterile container. To reduce contamination general genital hygiene should be performed: instruction should be given to the patient on how to provide a mid-stream sample of urine.

The patient should pass the first part of the urine sample into the toilet to flush the urethra, collect the middle part in the sterile sample pot and then pass the remaining urine into the toilet.

For catheter samples, urinary drainage bags contain a sampling port: this is usually a self-sealing plastic sheath located on the upper aspect of the inlet tubing (see picture below for an example).



A sterile syringe should be used (no needle is required), inserted at a 45° angle. The drainage system should not be disconnected as this can increase the risk of bacterial colonisation. If no urine is visible in the catheter tubing, a clamp can be applied few centimetres below the sampling port, and then wait until sufficient urine is visible within the tubing. The sampling port should be cleaned with an alcohol impregnated wipe.

All equipment should be available prior to undertaking the procedure

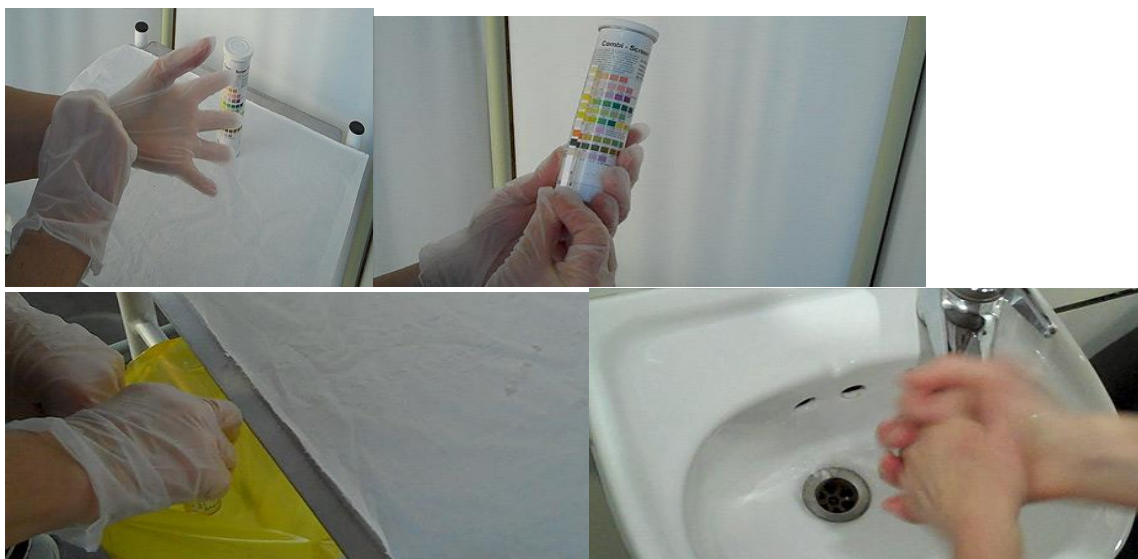
- Gloves
- Apron
- Hand sanitiser
- Urine dipsticks
- Specimen container
- Urine sample

The patient's notes

## Procedure

1. Confirm patients identity by asking for full name and date of birth, clarify with family/carer if patient unable to do so. In hospital check the Hospital identity band and confirm the details with the patient if possible.
2. Healthcare practitioner to introduce themselves, explain and discuss the procedure with the patient and relevant family members/carers
3. Discuss the procedure with the patient and any further actions that may be required following the results of the test
4. Obtain valid and informed consent and document this in the nursing records.
5. Identify the time the reagent strip is to be immersed in urine and the timeframe the results should be read within.
6. Check the expiry date of the test strips
7. Decontaminate hands prior to procedure
8. Ensuring adequate privacy and time are made available - ask the patient to provide a fresh specimen of urine in a suitable sterile container. Urinalysis is not an aseptic procedure, if there is a designated area for testing this should be used.
9. Apply single use disposable gloves and apron OR Open sterile dressing pack and apply gloves and apron
10. Remove a test strip from the container and replace cap securely
11. Decontaminate the clinical surface before and after testing. Put some tissue or paper towel on the designated work area and place the sample pot in the centre. If using a dressing pack place the sample pot centrally on the sterile field

12. Dip the test strip into the urine (ensuring all of the squares are immersed) for the time specified by the manufacturer and gently run the edge of strip along the container as you remove it to remove any excess urine.
13. Place the test strip flat on some gauze or tissue and wait the allotted time as specified by the manufacturers before reading the strip against the colour chart.
14. Whilst waiting replace the cap on the sample pot
15. Holding the strip at an angle, read the test strip against the reference grid, ensuring they do not touch.
16. Dispose of urine in toilet or designated sluice, dispose of container and waste
17. On completion of procedure, remove and dispose of Personal Protective Equipment (PPE) to comply with waste management policy
18. Decontaminate hands following removal of PPE
19. Record the results in patient health records, inform the patient of the results and discuss any further action that may be required
20. Inform patient's doctor of any abnormal results, inform other health professionals as required



## Evidence base

Urinalysis is a frequently performed procedure which is easy to carry out and inexpensive (Krogsgaard, Jorgensen and Gotzsche, 2015). Urinalysis can provide invaluable diagnostic information about the patient's health status (Gronhoj Larsen, 2010, Prochazka et al, 2005 and Merenstien et al, 2006) including indications of renal function, urological and liver disease, diabetes mellitus, urinary tract infection (UTI) and general hydration. Urinalysis can also be used for screening for substances that would not usually be expected to be present in urine for example, nitrite, blood (haematuria) (Rodgers et al, 2006), glucose and

leucocytes, or as a screening tool for illicit or illegal drugs such as marijuana, cocaine, opiates, and amphetamines (National Institute for Health and Care Excellence (NICE), 2007). Although different tests can be done on urine, a routine urinalysis often includes: colour, clarity, odour, specific gravity, pH, protein, glucose, red and white blood cells, nitrites and leukocyte esterase. Healthcare professionals must be aware of how to interpret results fully.

Routine urinalysis is recommended for screening pregnant women to detect bacteraemia (NICE, 2014). Urinalysis is an important screening tool for pre-eclampsia, which can be indicated by the presence/amount of protein in the urine (Williams and Craft, 2012). Urinalysis is also used to detect protein (albuminuria) in urine for people with diabetes and as a potential case finding tool for conditions that increase the risk of kidney disease such as hypertension and diabetes (Krogsboll., Jorgensen and Gotzsche, 2015). Foods, medications, metabolic products and infection can result in abnormal urine colours (Simmerville., Maxted and Pahira, 2005). Cloudy urine is often the result of precipitated phosphate crystals in alkaline urine, but can also be the result of pyuria (white cells in the urine). Normal urine pH is normally slightly acidic and determination of urine pH is useful in the diagnosis and management of urinary tract infection and calculi.

Leukocyte esterase and nitrites are indicators of a potential urine infection. Nitrites result from the reduction of urinary nitrates to nitrites by bacteria, although a positive urinalysis test is useful a negative result does not rule out a UTI. Leucocyte esterase is produced by neutrophils and may signal pyuria associated with UTI. Although urinalysis provides an effective screening tool it should not be used in isolation to guide treatment, due to false positives and false negatives that can occur if the sample is contaminated or left to stand for too long (Simmerville., Maxted and Pahira, 2005). If infection is suspected from the patient's presentation than further testing such as Microscopy, Culture and Sensitivities (MC&S) may be required.

The urinalysis dipstick reagents are sensitive to air exposure, so containers must be closed immediately after removing one strip (Gallagher., Schwartz and Weinstein, 1990). Test strips should be stored in their air tight container away from direct sunlight.

A midstream clean-catch urine specimen collection technique is usually adequate, and although recommended genital cleansing has no proven benefit (Unlu., Sardan and Ulker, 2007).

The effectiveness of urethral cleansing in order to reduce contamination remains debatable. However there is evidence to suggest that general genital hygiene using water is sufficient prior to specimen collection as the use of disinfectants may prohibit the growth of microorganisms if introduced into the urine (Cunha et al, 2013 and Simmerville., Maxted and Pahira, 2005).

Literature [Author, please supply references and any further reading you feel useful]

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[[FOOTER SECTION]]

Please note that information provided by Nursing Standard is not sufficient to make the reader competent to perform the task. All clinical skills should be formally assessed at the bedside by a nurse educator or mentor. It is the nurse's responsibility to ensure his or her practice remains up to date and reflects the latest evidence.