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**1. Write a short note on the characteristics and components of urine.**

Urine is a liquid [by-product](/wiki/By-product%22%20%5Co%20%22By-product) of [metabolism](/wiki/Metabolism%22%20%5Co%20%22Metabolism) in humans and in many other animals. Urine flows from the [kidneys](/wiki/Kidney%22%20%5Co%20%22Kidney) through the [ureters](/wiki/Ureter%22%20%5Co%20%22Ureter) to the [urinary bladder](/wiki/Urinary_bladder%22%20%5Co%20%22Urinary%20bladder). [Urination](/wiki/Urination%22%20%5Co%20%22Urination) results in urine being [excreted](/wiki/Excretion%22%20%5Co%20%22Excretion) from the body through the [urethra](/wiki/Urethra%22%20%5Co%20%22Urethra).



Urine has both physical and chemical characteristics.

**Physical characteristics:**

1. Color

2. Smell

3. PH

4. Density

5. Turbidity

6. Hazards

**1. Color:**

Urine varies in appearance, depending principally upon a body's level of [hydration](/wiki/Tissue_hydration%22%20%5Co%20%22Tissue%20hydration), as well as other factors. Normal urine is a transparent solution ranging from colorless to amber but is usually a pale yellow. In the urine of a healthy individual, the color comes primarily from the presence of [urobilin](/wiki/Urobilin%22%20%5Co%20%22Urobilin). Urobilin is a final waste product resulting from the breakdown of [heme](/wiki/Heme%22%20%5Co%20%22Heme) from [hemoglobin](/wiki/Hemoglobin%22%20%5Co%20%22Hemoglobin) during the destruction of aging blood cells.

Colorless urine indicates over-hydration, generally preferable to dehydration (though it can remove essential salts from the body). Colorless urine in drug tests can suggest an attempt to avoid detection of illicit drugs in the bloodstream through over-hydration.

**Various colors of urine includes**

* Dark yellow urine is often indicative of dehydration.
* Yellowing/light orange may be caused by removal of excess [B vitamins](/wiki/B_vitamin%22%20%5Co%20%22B%20vitamin) from the bloodstream.
* Bloody urine is termed [hematuria](/wiki/Hematuria%22%20%5Co%20%22Hematuria), a symptom of a wide variety of medical conditions.
* Dark orange to brown urine can be a symptom of [jaundice](/wiki/Jaundice%22%20%5Co%20%22Jaundice), [rhabdomyolysis](/wiki/Rhabdomyolysis%22%20%5Co%20%22Rhabdomyolysis), or [Gilbert's syndrome](/wiki/Gilbert%27s_syndrome%22%20%5Co%20%22Gilbert%27s%20syndrome).
* Black or dark-colored urine is referred to as melanuria and may be caused by a [melanoma](/wiki/Melanoma%22%20%5Co%20%22Melanoma) or non-melanin [acute intermittent porphyria](/wiki/Acute_intermittent_porphyria%22%20%5Co%20%22Acute%20intermittent%20porphyria).
* Pinkish urine can result from the consumption of [beets](/wiki/Beet%22%20%5Co%20%22Beet).
* Greenish urine can result from the consumption of [asparagus](/wiki/Asparagus%22%20%5Co%20%22Asparagus) or foods or beverages with green dyes.
* Reddish or brown urine may be caused by [porphyria](/wiki/Porphyria%22%20%5Co%20%22Porphyria) (not to be confused with the harmless, temporary pink or reddish tint caused by [beeturia](/wiki/Beeturia%22%20%5Co%20%22Beeturia)).
* Blue urine can be caused by the ingestion of [methylene blue](/wiki/Methylene_blue%22%20%5Co%20%22Methylene%20blue) (e.g., in medications) or foods or beverages with blue dyes.
* Blue urine stains can be caused by [blue diaper syndrome](/wiki/Blue_diaper_syndrome%22%20%5Co%20%22Blue%20diaper%20syndrome).
* Purple urine may be due to [purple urine bag syndrome](/wiki/Purple_urine_bag_syndrome%22%20%5Co%20%22Purple%20urine%20bag%20syndrome).

**2. Odor**:

The odor of normal human urine can reflect what has been consumed or specific diseases. For example, an individual with diabetes mellitus may present a sweetened urine odor. This can be due to kidney diseases as well, such as [kidney stones](/wiki/Kidney_stone_disease%22%20%5Co%20%22Kidney%20stone%20disease).

Eating asparagus can cause a strong odor reminiscent of the vegetable caused by the body's breakdown of [asparagusic acid](/wiki/Asparagusic_acid%22%20%5Co%20%22Asparagusic%20acid). Likewise consumption of [saffron](/wiki/Saffron%22%20%5Co%20%22Saffron), [alcohol](/wiki/Ethanol%22%20%5Co%20%22Ethanol), [coffee](/wiki/Coffee%22%20%5Co%20%22Coffee), [tuna fish](/wiki/Tuna_fish%22%20%5Co%20%22Tuna%20fish), and [onion](/wiki/Onion%22%20%5Co%20%22Onion) can result in telltale scents. Particularly spicy foods can have a similar effect, as their compounds pass through the kidneys without being fully broken down before exiting the body.

**3. Turbidity**

The turbidity of the urine sample is gauged subjectively and reported as clear, slightly cloudy, cloudy, opaque or flocculent. Normally, fresh urine is either clear or very slightly cloudy. Excess turbidity results from the presence of suspended particles in the urine, the cause of which can usually be determined by the results of the microscopic urine sediment examination. Common causes of abnormal turbidity include: increased cells, urinary tract infections or obstructions.

**4. PH:**

The [pH](/wiki/PH%22%20%5Co%20%22PH) normally is within the range of 5.5 to 7 with an average of 6.2.  In persons with [hyperuricosuria](/wiki/Hyperuricosuria%22%20%5Co%20%22Hyperuricosuria), acidic urine can contribute to the formation of [stones](/wiki/Calculus_%28medicine%29%22%20%5Co%20%22Calculus%20%28medicine%29) of [uric acid](/wiki/Uric_acid%22%20%5Co%20%22Uric%20acid) in the kidneys, ureters, or bladder. Urine pH can be monitored by a physician or at home.

A diet which is high in protein from meat and dairy, as well as alcohol consumption can reduce urine pH, whilst potassium and organic acids, such as from diets high in fruit and vegetables, can increase the pH and make it more alkaline. Some drugs also can increase urine pH, including acetazolamide, potassium citrate, and sodium bicarbonate.

Cranberries, popularly thought to decrease the pH of urine, have actually been shown not to acidify urine. Drugs that can decrease urine pH include [ammonium chloride](/wiki/Ammonium_chloride%22%20%5Co%20%22Ammonium%20chloride), chlorothiazide diuretics, and methenamine mandelate.

**5. Density:**

Density is also known as “specific gravity.” This is the ratio of the weight of a volume of a substance compared with the weight of the same volume of distilled water. The density of normal urine ranges from 0.001 to 0.035.

**6. Hazards**

Healthy urine is not toxic. However, it contains compounds eliminated by the body as undesirable, and can be irritating to skin and eyes. With suitable processing, it is possible to extract [potable water](/wiki/Potable_water%22%20%5Co%20%22Potable%20water) from urine.

**Chemical components includes:**

1. Water

2. Urea

3. Salts

4. Pigment

Urine is an aqueous solution of greater than 95% water, with a minimum of these remaining constituents, in order of decreasing concentration:

* Urea 9.3 g/L.
* Chloride 1.87 g/L.
* Sodium 1.17 g/L.
* Potassium 0.750 g/L.
* Creatinine 0.670 g/L.
* Other dissolved ions, inorganic and organic compounds (proteins, hormones, metabolites).



kidneys, ureters, urinary bladder , and urethra. The kidneys form the [urine](https://api.seer.cancer.gov/rest/glossary/latest/id/554bcac8e4b0426fced72abe) and account for the other functions attributed to the urinary system. The ureters carry the urine away from kidneys to the urinary bladder, which is a temporary reservoir for the urine. The urethra is a tubular structure that carries the urine from the urinary bladder to the outside.