

# Fundamentals of fluids detection and secretions



## Urine

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## **Urine:**

Urine is a liquid, yellow-straw coloured fluid waste material produced by the body cellular metabolism in humans and excreted by the process of urination. It is excreted out from the body by an opening called urethra. It follows a pathway from kidney to urinary bladder through ureters.

On an average urine production is around 1.4 Liters per day by per person. It depends from person to person on the various factors like weight , health, state of hydration and environmental factors.

Two unique characteristics of a urine specimen account for this continued popularity:

- 1. Urine is a readily available and easily collected specimen.**
- 2. Urine contains information, which can be obtained by inexpensive laboratory tests, about many of the body's major metabolic functions.**

# Normal constituents of urine

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)



## Urine

0.05% Ammonia	0.18% Sulphate
0.12% Phosphate	0.6% Chloride
0.01% Magnesium	0.015% Calcium
0.6% Potassium	0.1% Sodium
0.1% Creatinine	0.03% Uric acid
2% Urea	

**95% Water**

Normal constituents of urine

## Abnormal Constituents of Urine

Many a times tests are used in analyzing the urine in order to determine, whether it contains abnormal substances indicative of diseases or illegal use of some drugs. Usually, abnormal substances that are present in the urine are:

- *Proteinuria—Protein content in urine, often due to leaky or damaged glomeruli.*
- *Oliguria—An abnormally small amount of urine, often due to shock or kidney damage.*
- *Polyuria—An abnormally large amount of urine, often caused by diabetes*
- *Dysuria—Painful or uncomfortable urination, often from urinary tract infections.*
- *Hematuria—Red blood cells in urine, from infection or injury.*
- *Glycosuria—Glucose in urine, due to excess plasma glucose in diabetes.*

## Colors of urine :

It is mainly transparent or ranges from colorless to amber or pale yellow. The color is due to UROBILIN which is final waste product. Its formed by breakdown of hemoglobin during the destruction of aging of blood cells. There are few conditions in which the color of urine variants from the normal. Some of them are:

- - dark yellow indicates the dehydration
- - light orange due to removal of excess of b vitamins.
- - urine with blood is termed as hematuria which is caused due to medical conditions
- - dark orange to brown is due to jaundice
- - pinkish urine is due to consumption of beets.

## **Forensic importance of urine as an evidence**

It can be found in the cases of Strangulation, violent cases, poisoning cases, sexual assault etc. It can be used to analyses the presence of drugs, proteins, alcohol and poisons.

Any questions?

*Thank  
You*