

# BIO TEAM 429

بسم الله الرحمن الرحيم

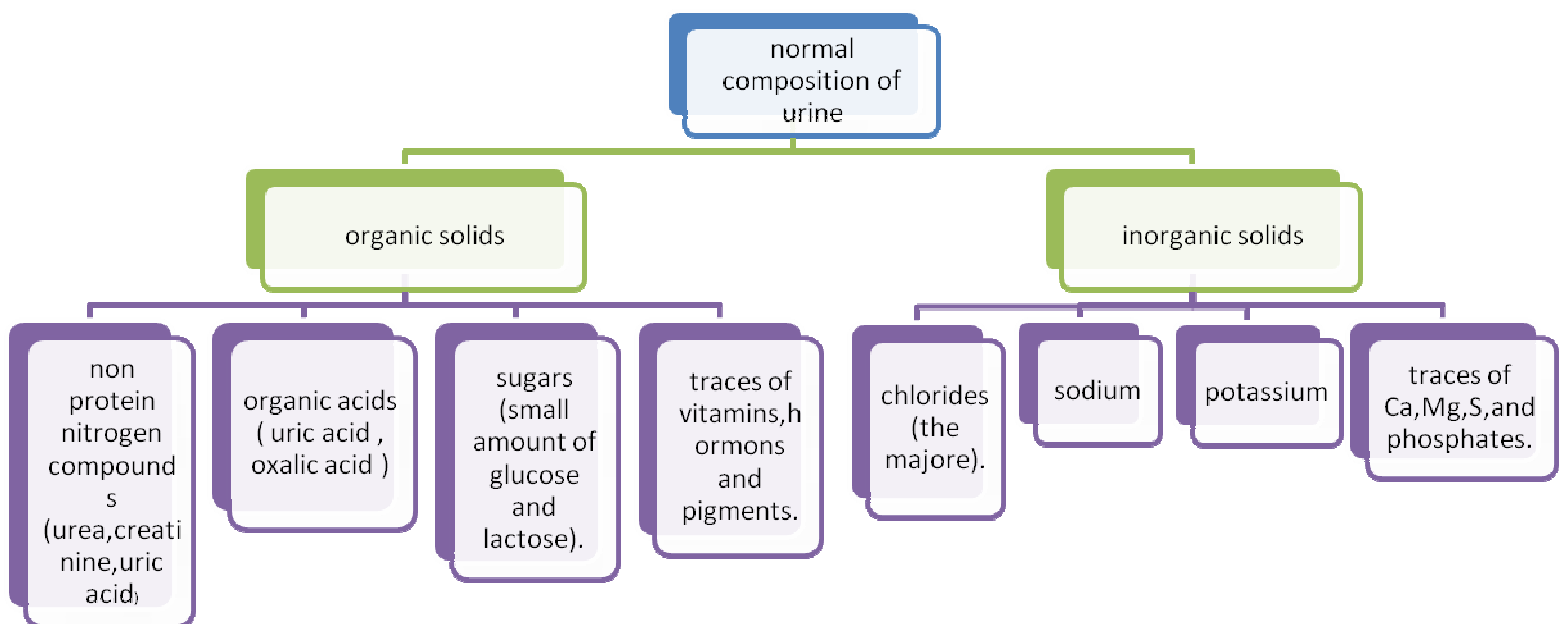
RENAL BLOCK

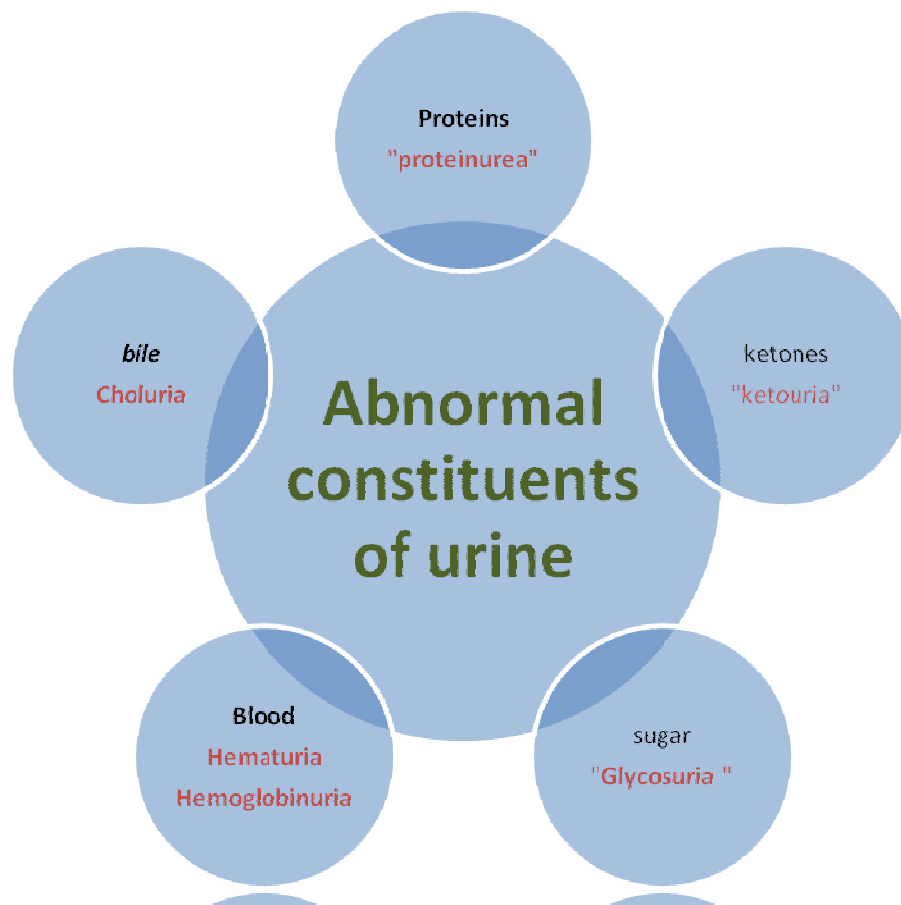
Chemical examination of urine

إعداد الطالبات

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- **Urine** is a fluid obtained from blood through renal glomeruli with considerable changes before it is excreted as urine.
- **Urine** is normally 95% water and 5% solutes
- **Urine** consists of urea and other organic and inorganic chemicals dissolved in water.





### *Abnormal constituents of urine:*

#### **Proteins:**

- Normal urine contains very little protein usually, less than 200 mg / 24 hours .
- More than this level leads to a condition called "Proteinuria".
- The causes of proteinuria can be grouped into 3 major categories : Prerenal, Renal and Postrenal.

	<u><b>Prerenal proteinuria</b></u>	<u><b>Renal Proteinuria;</b></u>	<u><b>Postrenal proteinuria:</b></u>
<b>Caused by</b>	conditions with increased plasma protein prior to its reaching the kidney .	<ul style="list-style-type: none"> <li><u>Glomerular proteinuria</u> is due to ↑ glomerular permeability → filtration of high molecular weight proteins ( e.g. glomerulonephritis).</li> <li><u>Tubular proteinuria</u> occurs as a result of ↓ tubular reabsorption with normal glomerular permeability → excretion of low molecular weight proteins (e.g. chronic nephritis)</li> </ul>	Protein can be added to the urine specimen as it passes through the structures of the lower urinary tract (ureters, bladder , urethra, prostate and vagina). Lower urinary tract infections - Trauma - Tumors - Stones
<b>Comment</b>	The increased filtration of these proteins exceeds the normal reabsorptive capacity of the renal tubules, resulting in an overflow of the proteins in the urine		
<b>Diseases</b>	<ul style="list-style-type: none"> <li>Multiple myeloma</li> </ul> The Bence-Jones	<ul style="list-style-type: none"> <li>Orthostatic (Postural) Proteinuria</li> <li><u>Microalbuminuria</u></li> </ul>	

## Prerenal proteinuria:

### Multiple Myeloma

a proliferative disorder of the immunoglobulin-producing plasma cells, the serum contains markedly elevated levels of monoclonal immunoglobulin light chains(). (**Bence Jones Protein**). This low molecular-weight protein is filtered in quantities exceeding the tubular reabsorption capacity and is excreted in the urine.

**The Bence-Jones**

protein unlike other proteins as coagulates at temperature between 40°C and 60°C and dissolves when the temperature reaches 100 °C and coagulates again at 60°C . Suspected cases of multiple myeloma must be diagnosed by performing serum electrophoresis and immunoelectrophoresis.

**Renal Proteinuria:****Orthostatic (Postural) Proteinuria:**

Persistent benign proteinuria occurs frequently in young adults and is termed orthostatic.

It occurs following periods spent in a vertical posture and disappears when a horizontal position is assumed.

Increased pressure on the renal vein in the vertical position is believed to account for this condition.

**Microalbuminuria:**

- Presence of small amounts of albumin in the urine

(20– 200 mg/L) that cannot be detected by ordinary urine testing & needs special tests for detection.

- It is an early indicator of glomerular affection due to uncontrolled DM or hypertension.

- Nitrite :

Positive nitrite test in urine is significant of bacteria in urine

