

The background features a dark blue gradient with a subtle pattern of white dots. On the left side, there are several technical diagrams. A large circular scale with numerical markings from 140 to 260 is prominent. Other diagrams include concentric circles, dashed lines, and arrows, suggesting a scientific or engineering context.

RENAL BLOCK

DR TARIQ ALJOHANI

OBJECTIVES

- Understand the relationship between the anatomical structures of different components of the Renal system and their functions.
- Discuss the pathology, microbiology, pathogenesis, and factors contributing to the development of most common diseases affecting the Renal system.
- Use basic sciences to explain patient's signs and symptoms, interpret investigation results, and provide justifications for their views.

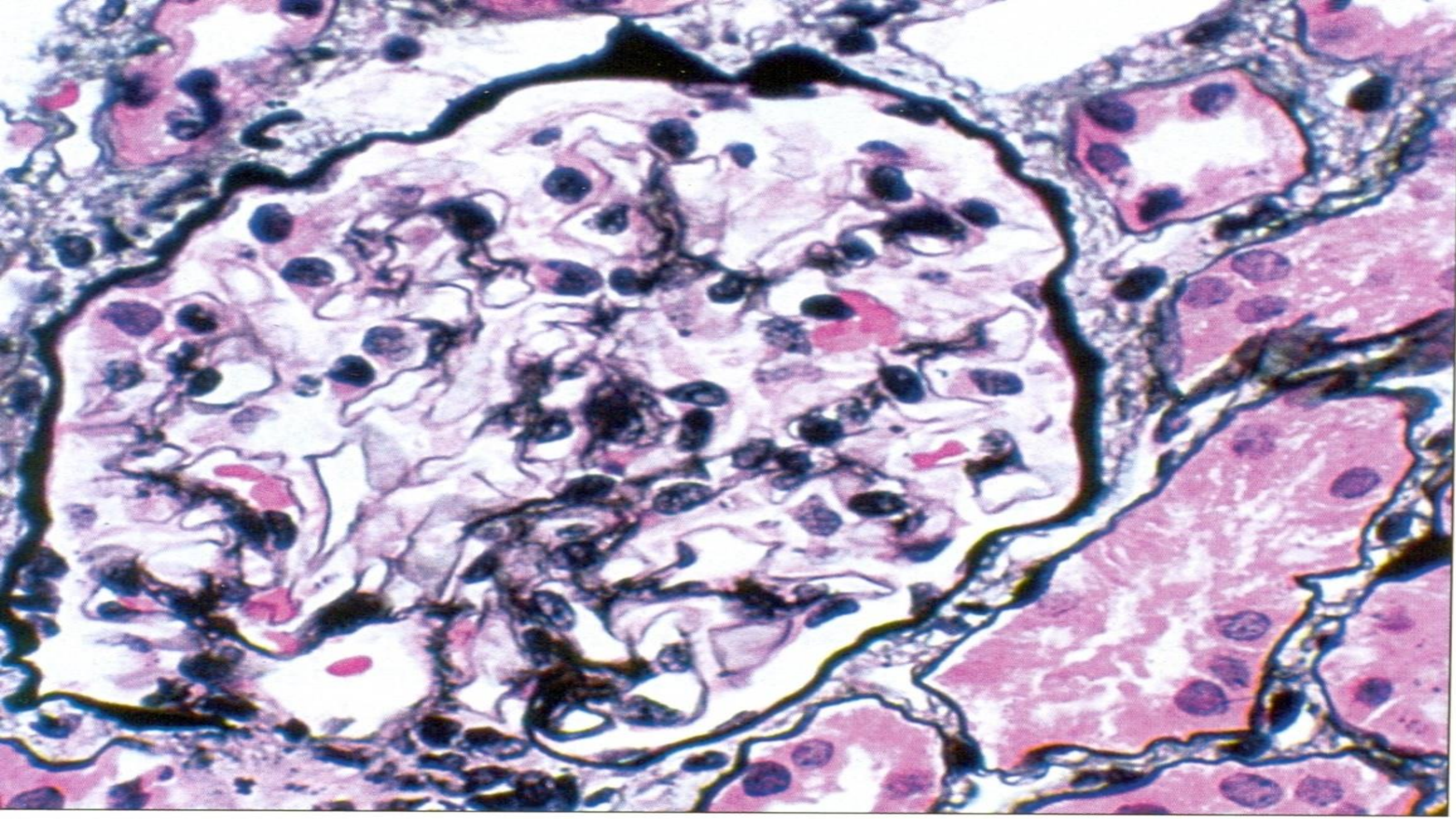
OBJECTIVES

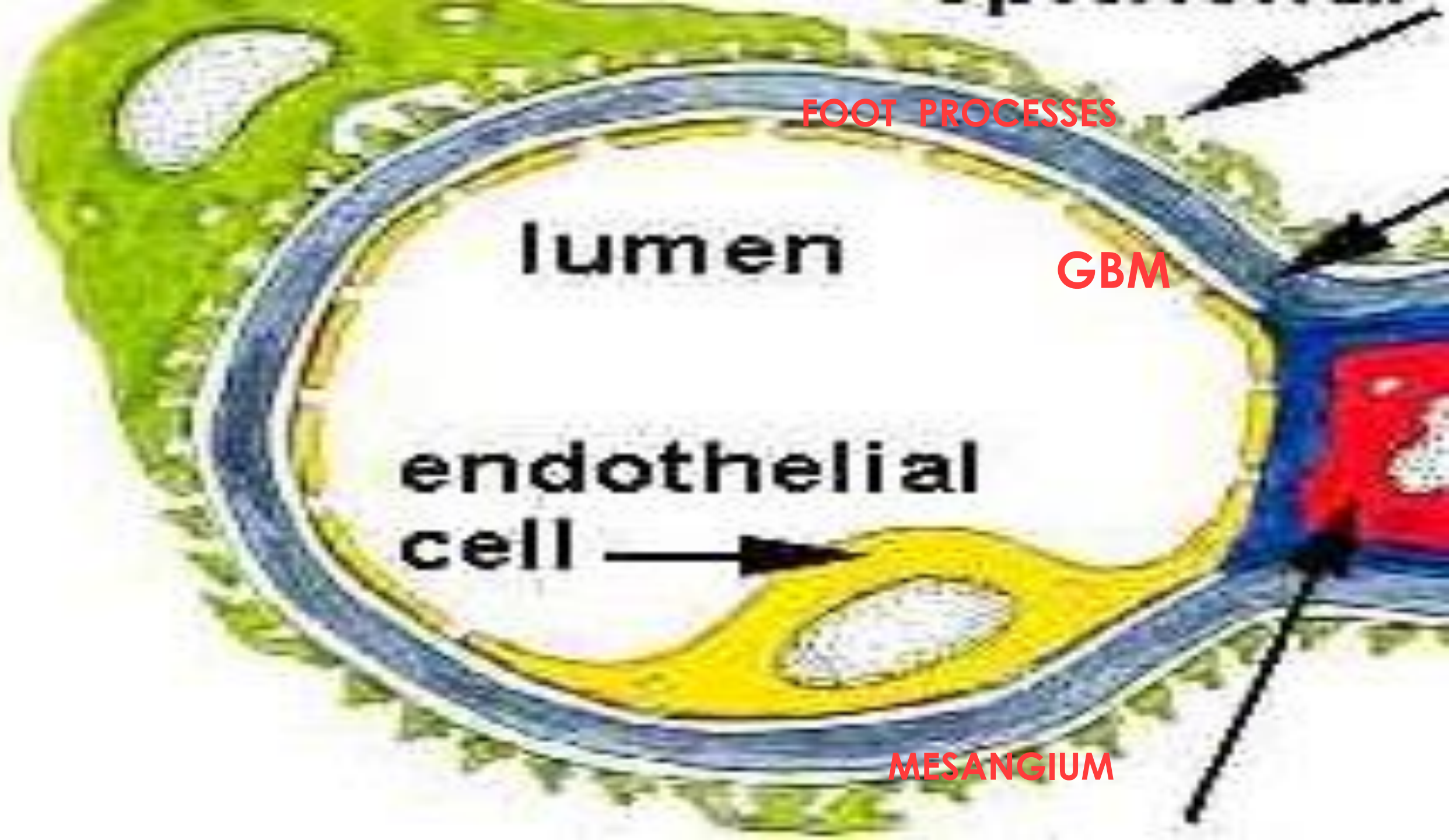
- Develop communication skills and explore psychosocial, and ethical issues in their assessment.
- Use clinical cases to apply knowledge learnt, generate hypotheses, build an enquiry plan, and use evidence to refine their hypotheses, and justify their views.
- Design a management plan, and understand the pharmacological basis of drugs used in the management of common diseases affecting the Renal system.

ACUTE KIDNEY INJURY

OBJECTIVES

- Introduction to the renal pathology
- Acute Kidney Injury
- Definition, Types, Clinical Overview, Causes
- Pathological findings
- Differential Diagnosis





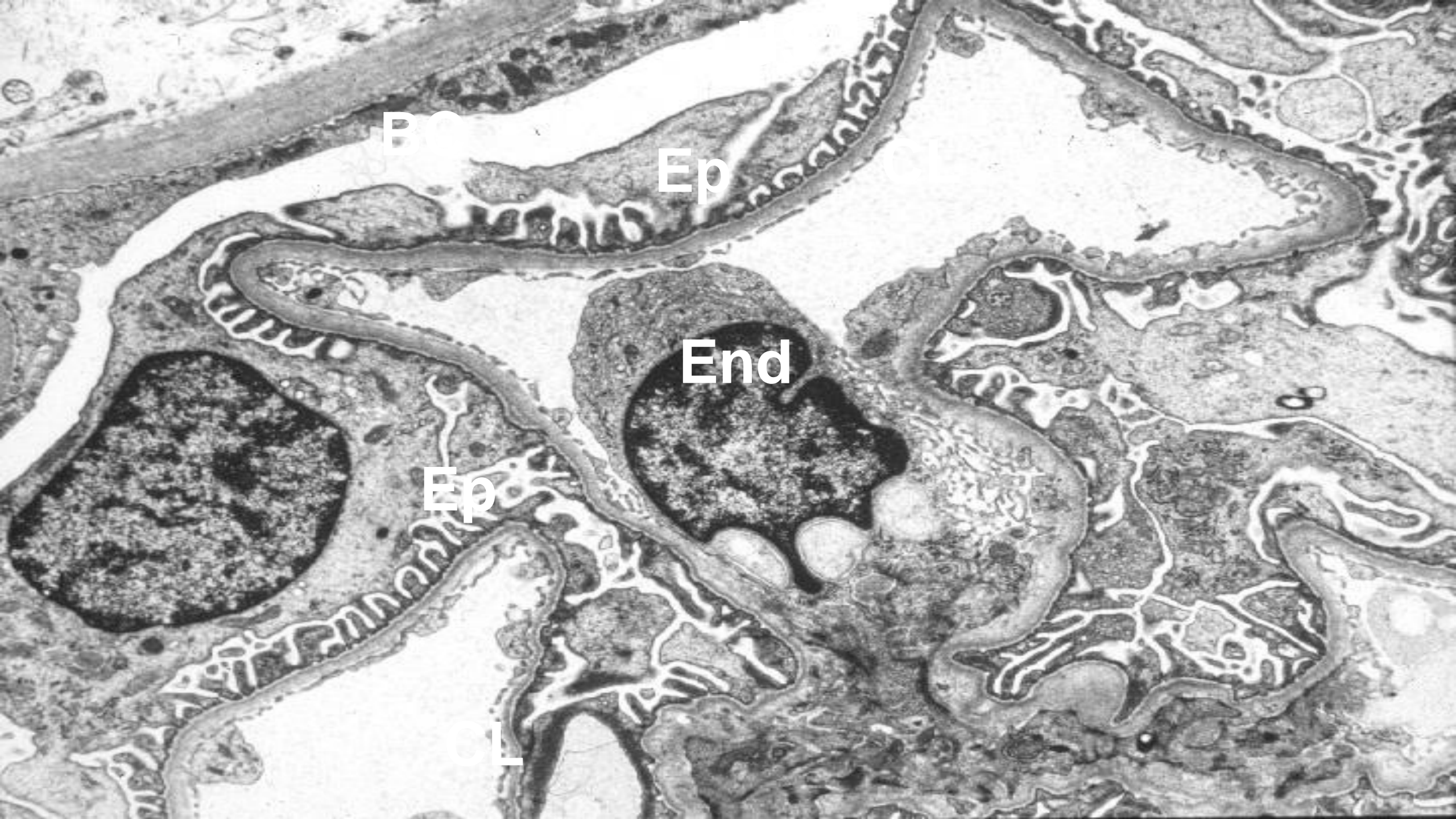
FOOT PROCESSES

lumen

GBM

endothelial
cell

MESANGIUM



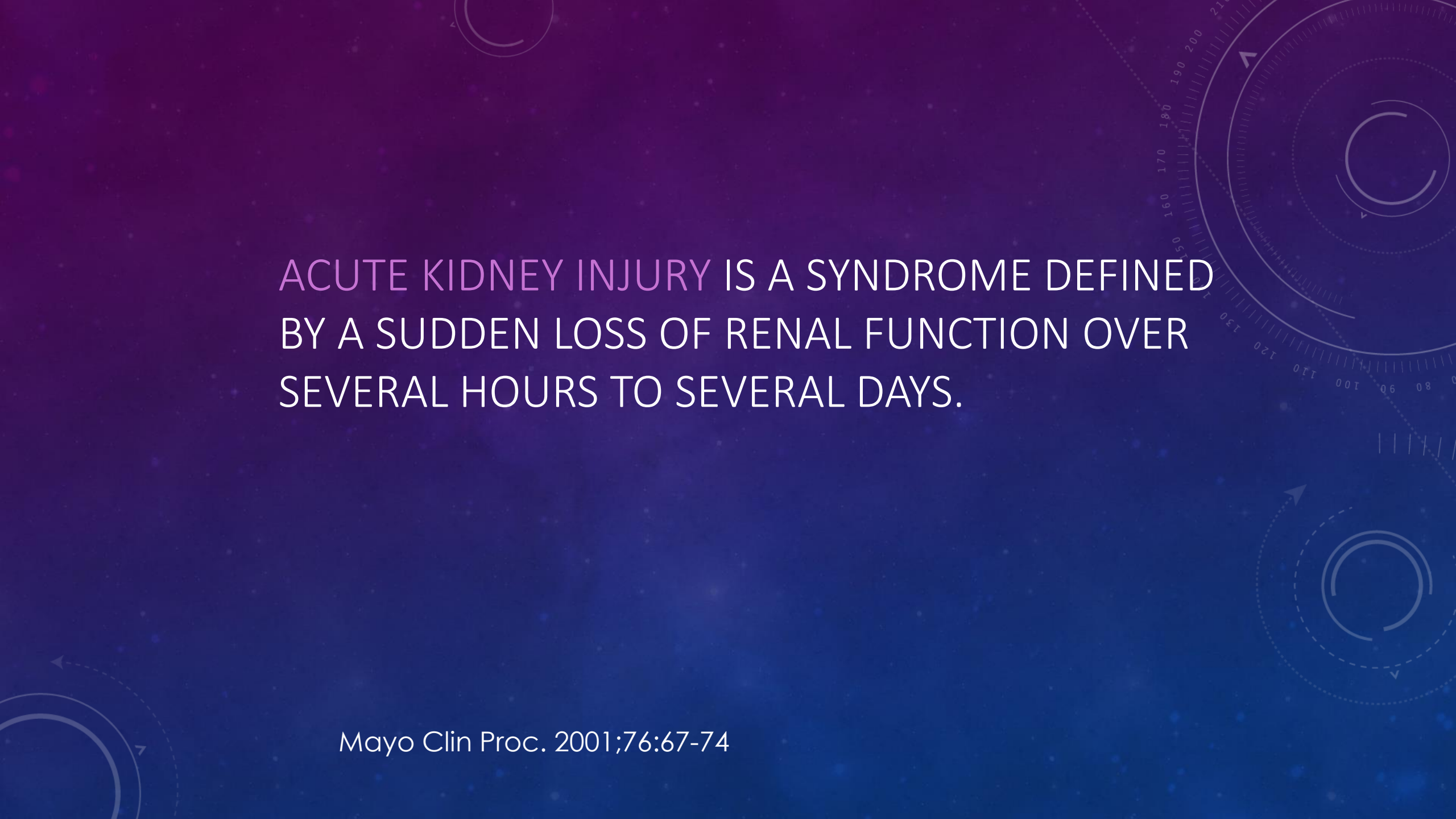
BC

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End

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The background features a dark blue gradient with a subtle pattern of white stars and technical diagrams. On the right side, there are several circular diagrams resembling gauges or dials with numerical scales (e.g., 160, 170, 180, 190, 200, 210) and arrows. On the left, there are dashed circular paths with arrows indicating direction. The overall aesthetic is clean and scientific.

ACUTE KIDNEY INJURY IS A SYNDROME DEFINED
BY A SUDDEN LOSS OF RENAL FUNCTION OVER
SEVERAL HOURS TO SEVERAL DAYS.

Mayo Clin Proc. 2001;76:67-74

WHAT CONSTITUTES THE SYNDROME OF ARF?

- Accumulation of nitrogenous waste products.
- Increased Scr.
- Derangement of extracellular fluid balance.
- Acid-base disturbance.
- Electrolyte and mineral disorders.

WHAT CONSTITUTES UREMIA?

- Renal failure
- Lethargy
- Anorexia
- Pericarditis
- Neuropathy
- Nausea and vomiting
- Pruritis
- Dyspnea

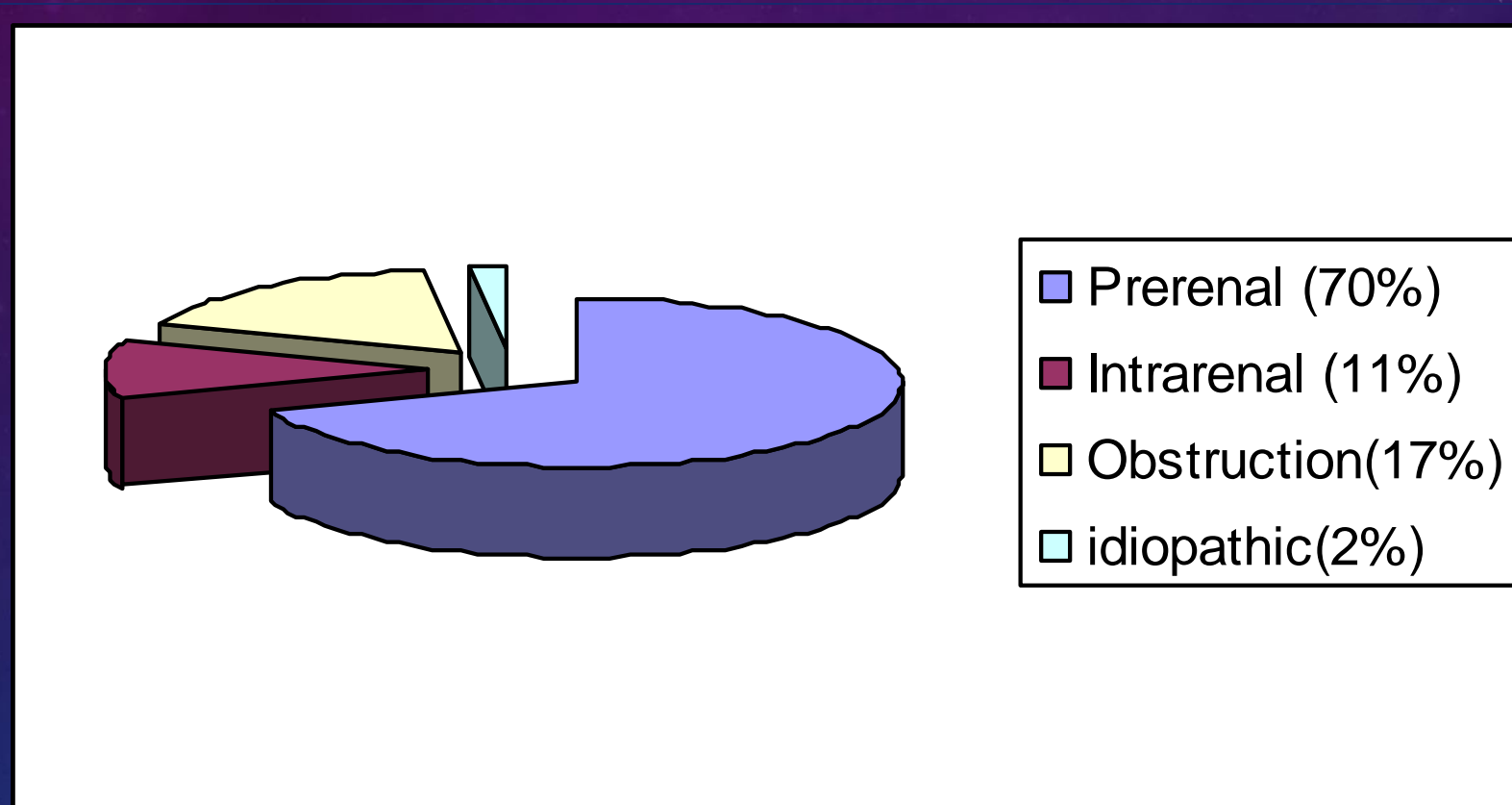
Azotemia: elevated blood urea nitrogen not from an intrinsic renal disease

Oliguria: urine output less than 500cc/24hr.

Nonoliguria: urine output greater than 500cc/24hr.

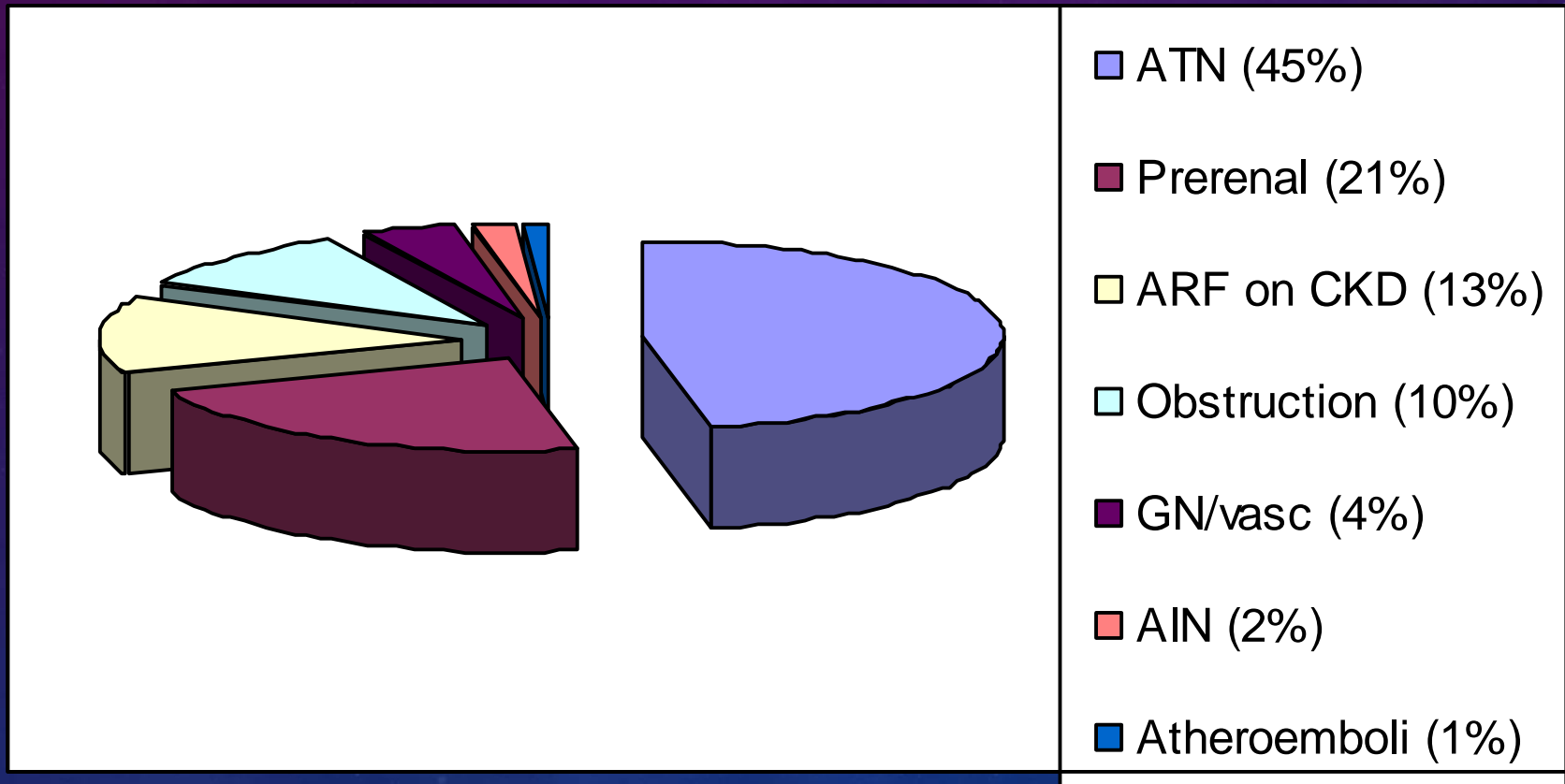
Anuria: urine output less than 50cc/24hr.

ETIOLOGY OF ARF AMONG OUTPATIENTS

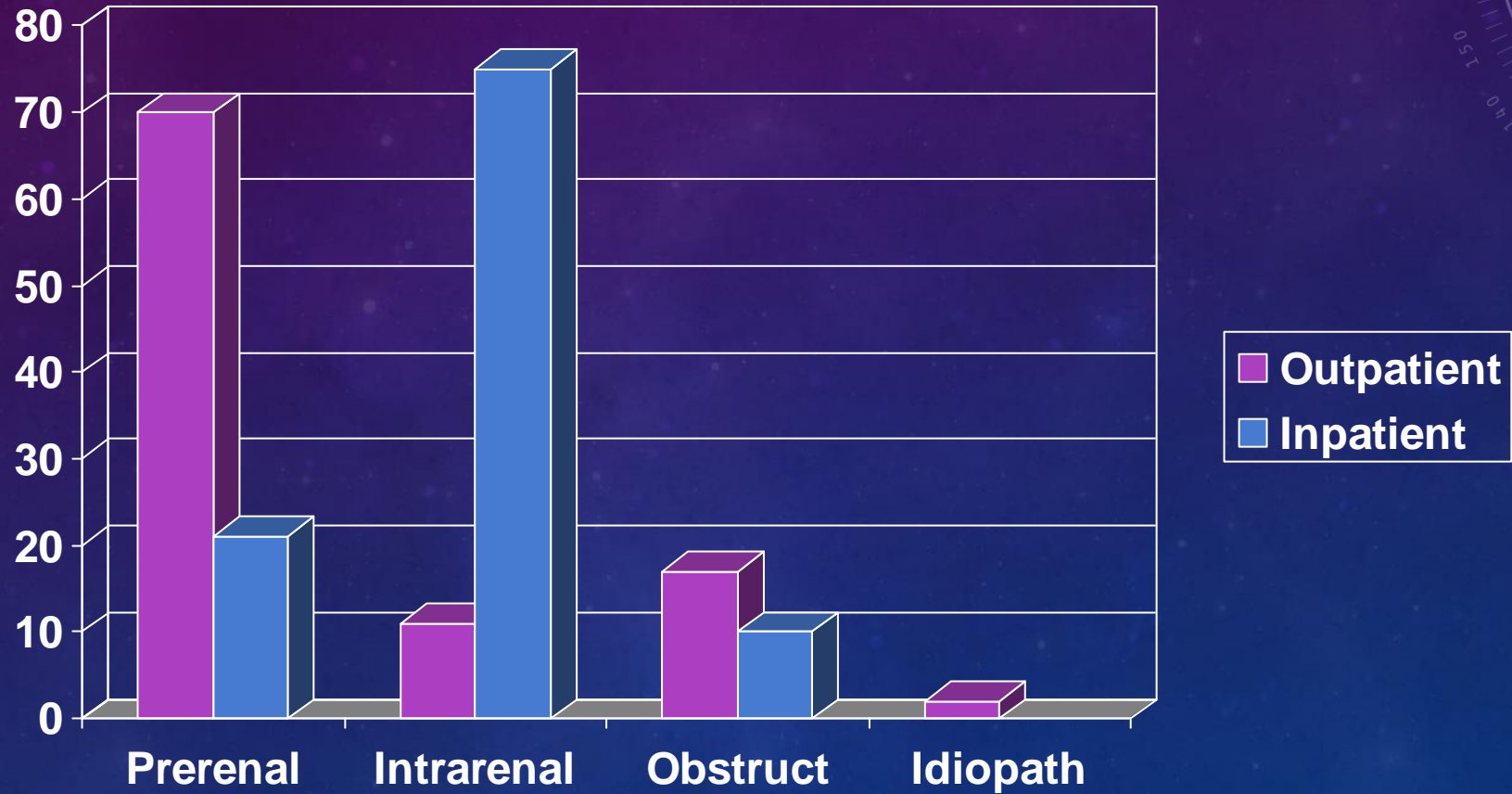


AJKD 17:191-198, 1991

ETIOLOGY OF ARF AMONG INPATIENTS



ETIOLOGY OF ARF



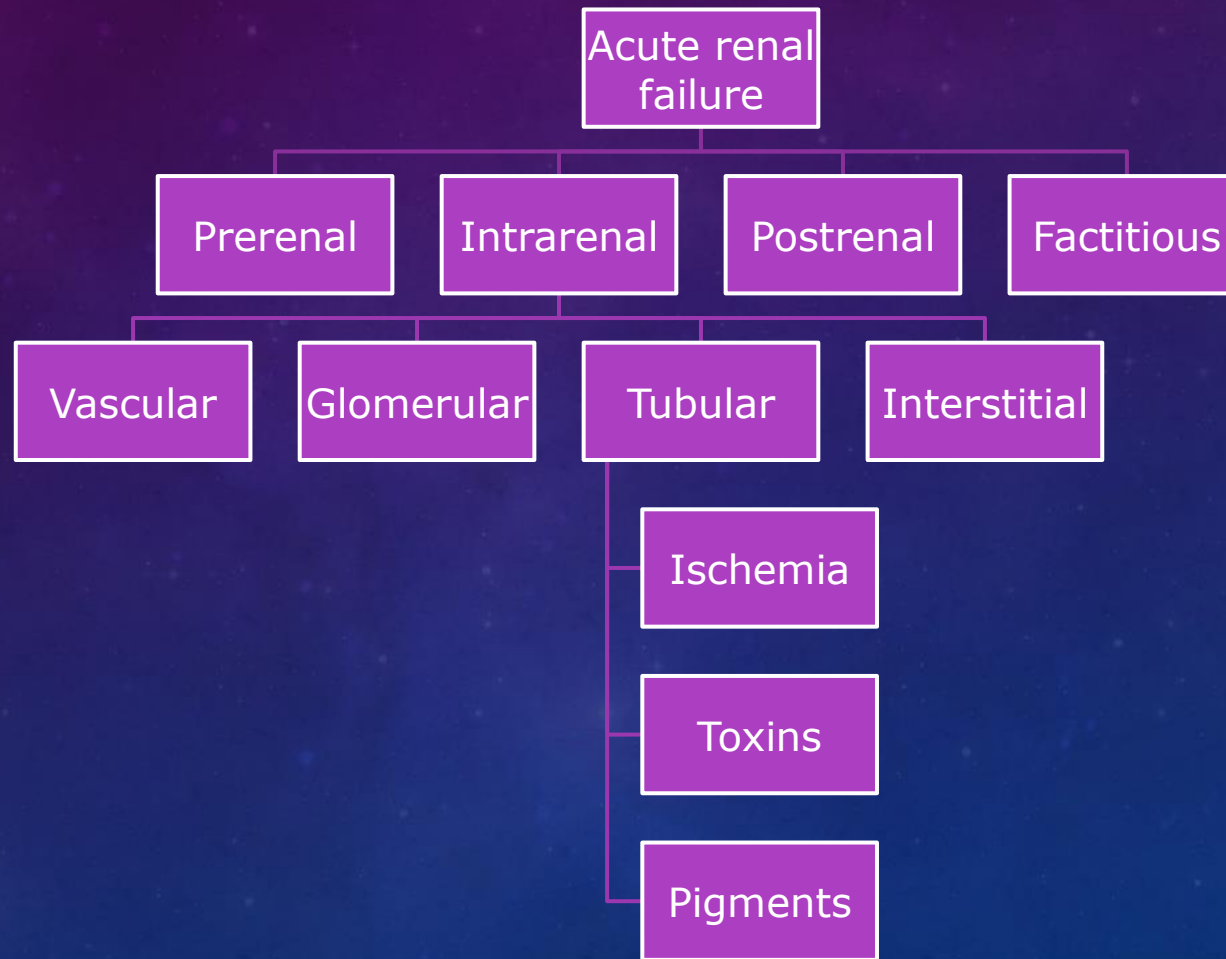
MORTALITY OF ARF

- “Despite technical progress in the management of acute renal failure over the last 50 years, mortality rates seem to have remained unchanged at around 50%.”

PREDICTORS OF DIALYSIS IN ARF

- Oliguria:
 - <400cc/24hr 85% will require dialysis
 - >400cc/24hr 30-40% will require dialysis
- Mechanical ventilation
- Acute myocardial infarction
- Arrhythmia
- Hypoalbuminemia
- ICU stay
- Multi-system organ failure

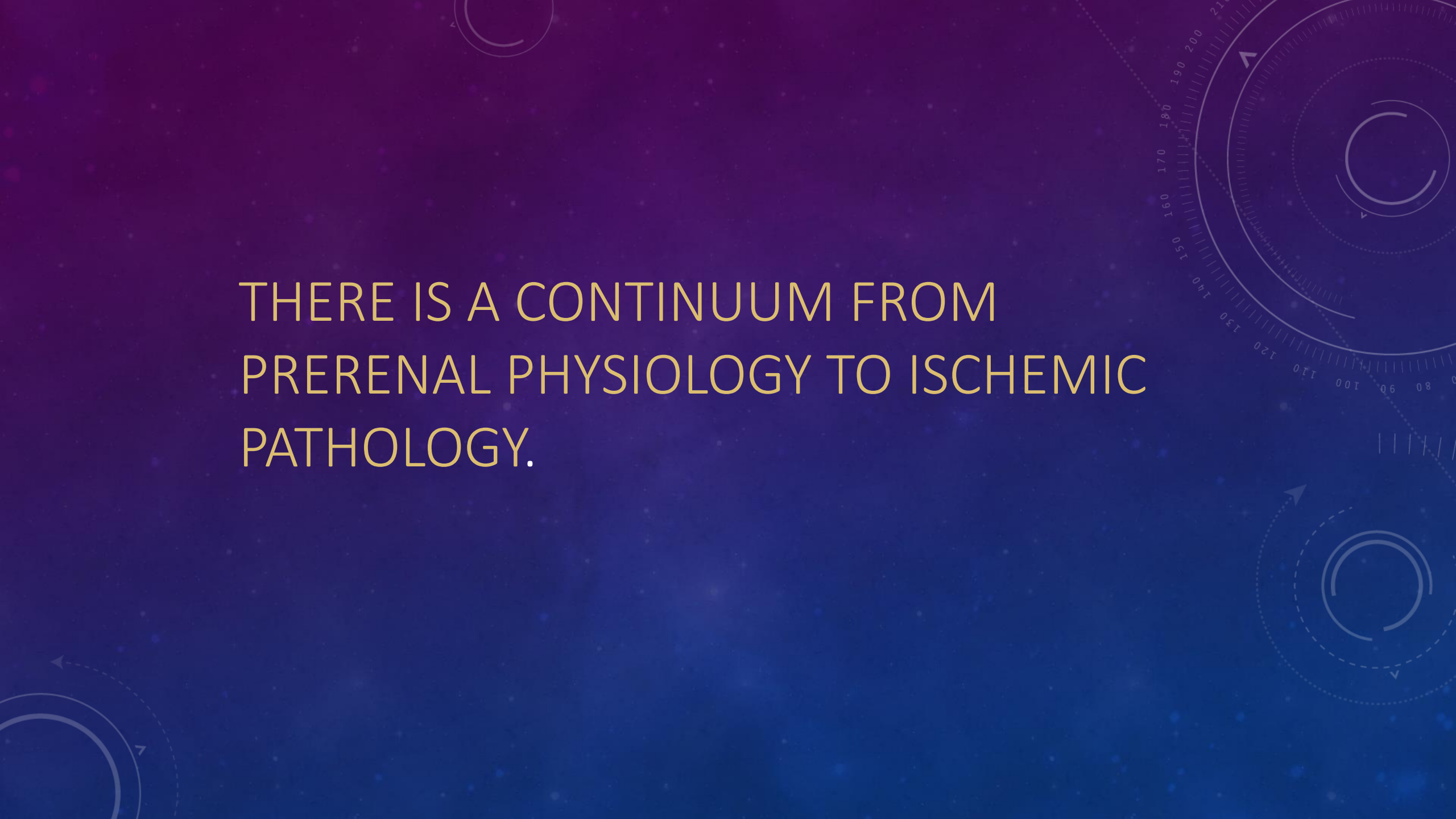
THE PATHOPHYSIOLOGY OF ARF



PRERENAL ARF (DECREASED RENAL BLOOD FLOW)

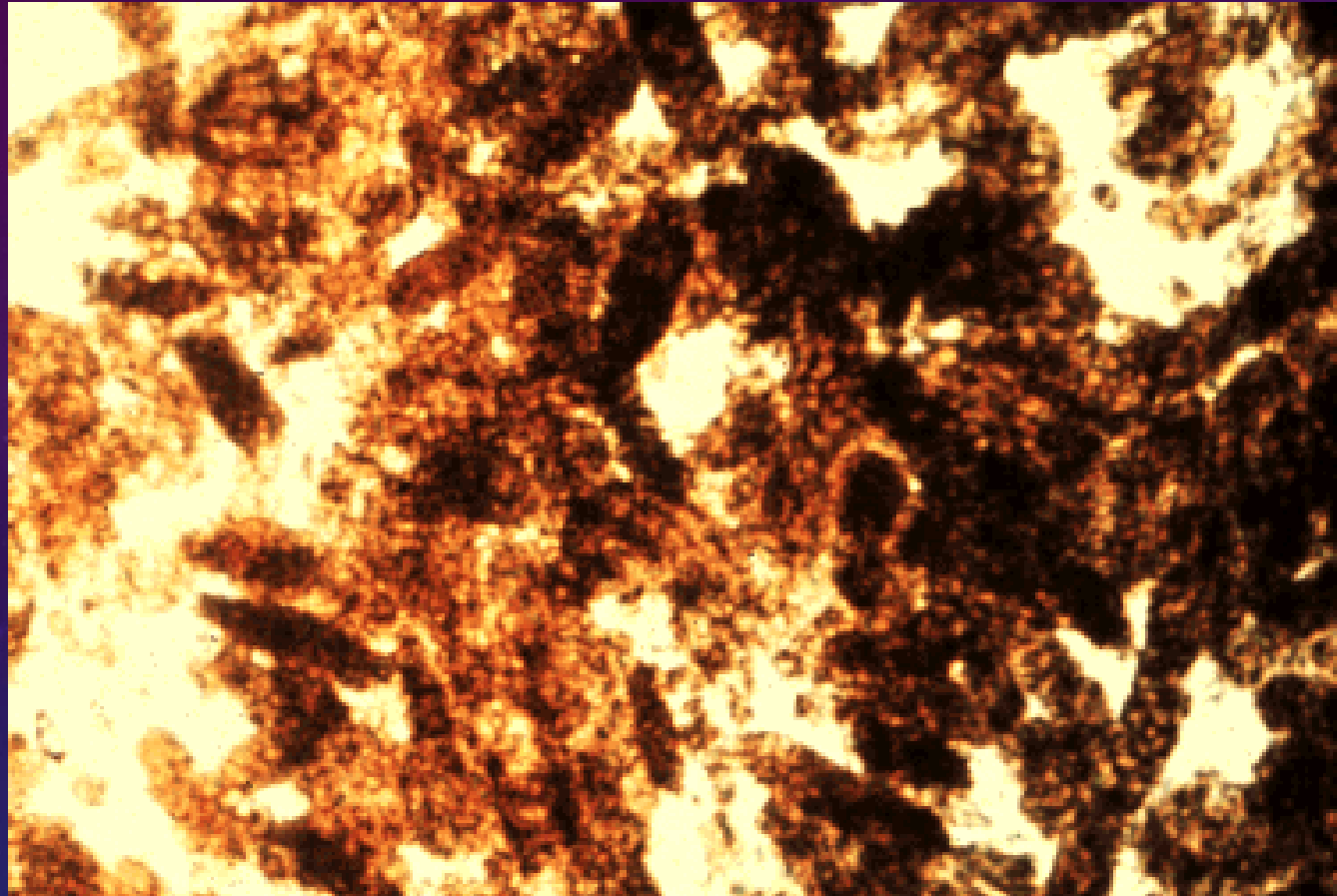
- Hypotension
 - Sepsis, cardiogenic, medication
- Cardiogenic
- Vascular
 - Vasculitis, renal artery compromise, AAA, atheroemboli
- Third Spacing
 - Bowel obstruction, cirrhosis, nephrotic syndrome, major surgery,
- Volume depletion
 - GI losses: vomiting, diarrhea
 - Skin losses: burns, sweat
 - Renal losses: DKA, DI, Addison's, Na wasting
- Drug-induced
 - NSAID, CsA, FK506, ACE, ARB

THERE IS A CONTINUUM FROM
PRERENAL PHYSIOLOGY TO ISCHEMIC
PATHOLOGY.

The background is a dark blue gradient with a subtle pattern of small white dots. On the right side, there are several circular gauges or dials. The top-right gauge has a scale from 0 to 210 in increments of 10, with a white arrow pointing to approximately 195. Below it is another gauge with a scale from 0 to 100 in increments of 10, with a white arrow pointing to approximately 85. At the bottom right, there is a dashed circular arrow pointing clockwise. On the left side, there are also some faint circular elements, including a dashed arrow pointing left and a solid arrow pointing right.

TUBULAR TOXINS

- Antimicrobials: aminoglycosides, vancomycin, foscarnet, pentamidine, amphotericin B
- Chemotherapeutics: cisplatin, mitomycin C, ifosfamide
- Immunotherapy: IVIG
- Complex Sugars: maltose, sucrose, mannitol
- Heavy metals
- Sepsis, hypoxia
- Radiocontrast agents



Sediment in ATN Urine sediment showing multiple, muddy brown granular casts. These findings are highly suggestive of acute tubular necrosis in a patient with acute renal failure. Courtesy of Harvard Medical School.

Uptodate Online 11.2, Rose BD, 2003

ACUTE TUBULAR INJURY IS A
CLINICOPATHOLOGICAL ENTITY: DEFINED BY
1- ACUTE RENAL FAILURE.
2- TUBULAR INJURY/NECROSIS

ACUTE RENAL FAILURE

- I. Acute tubular necrosis (ATN)
- II. Ischemic

- 1. Shock***
- 2. Sepsis***
- 3. Incompatible blood transfusions***
- 4. thrombotic diseases***

ACUTE RENAL FAILURE

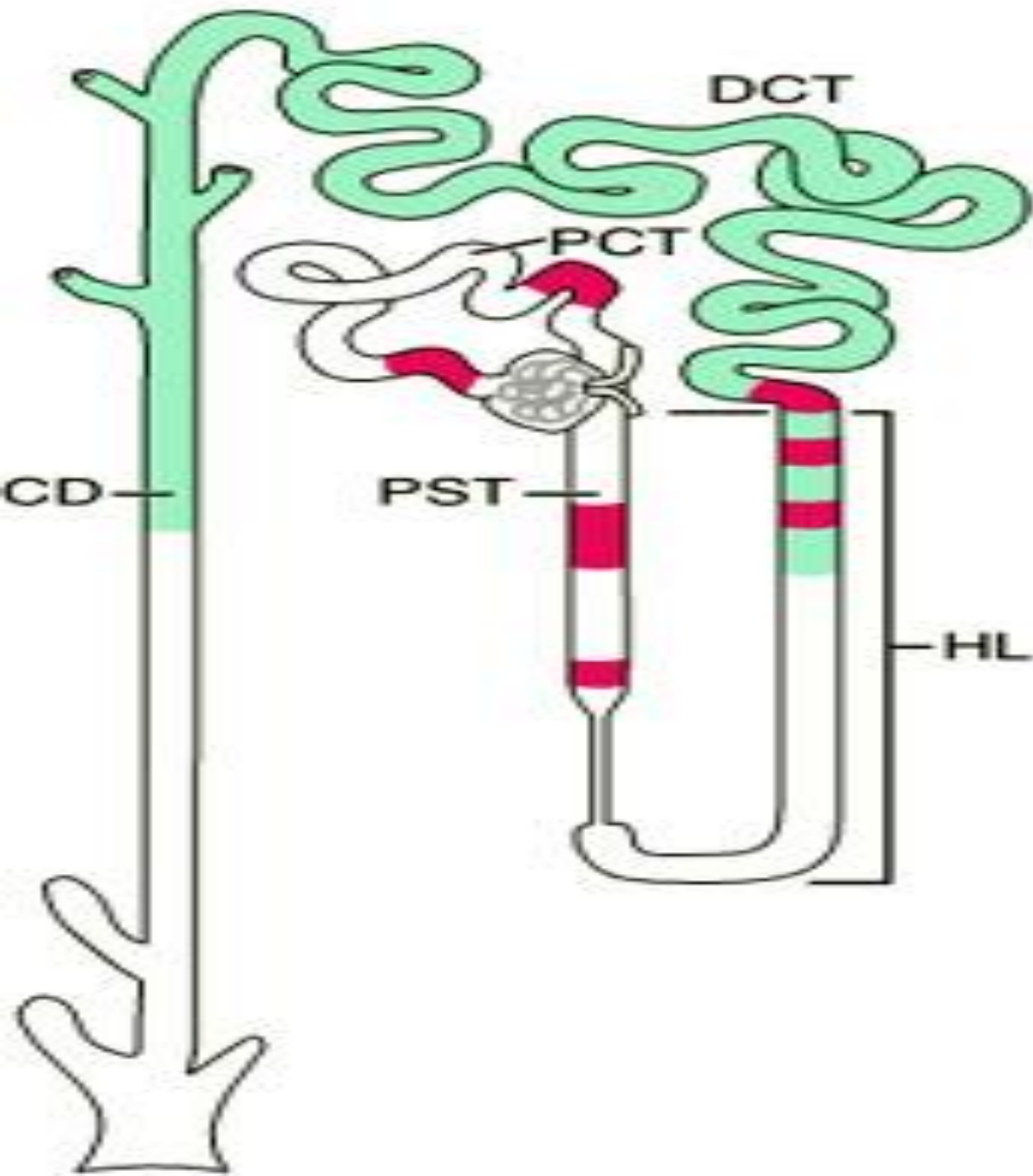
I. Acute tubular necrosis (ATN)

III. Toxic : A- Endogenous: Crush injury- Hemoglobinopathy.
B- Exogenous: Drugs- radiocontrast dye- metals..

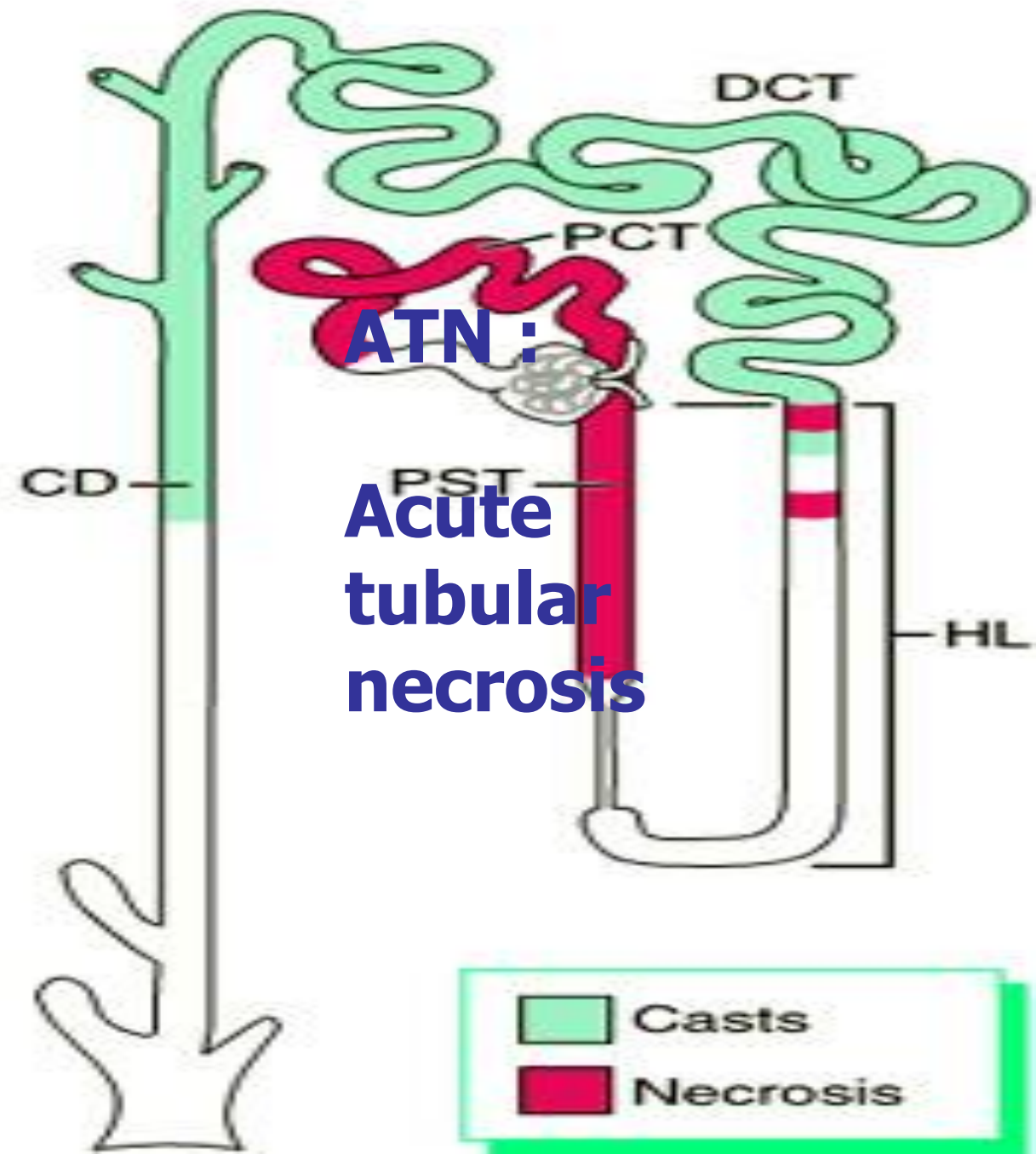
Acute tubular necrosis (ATN)

- ***Clinicopathological entity***
- ***Destruction of tubular epithelial cell***
- ***Clin. acute suppression of renal function
(no urine or below 400 ml/24h)***
- ***Most common cause of renal failure***

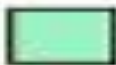

ISCHEMIC TYPE

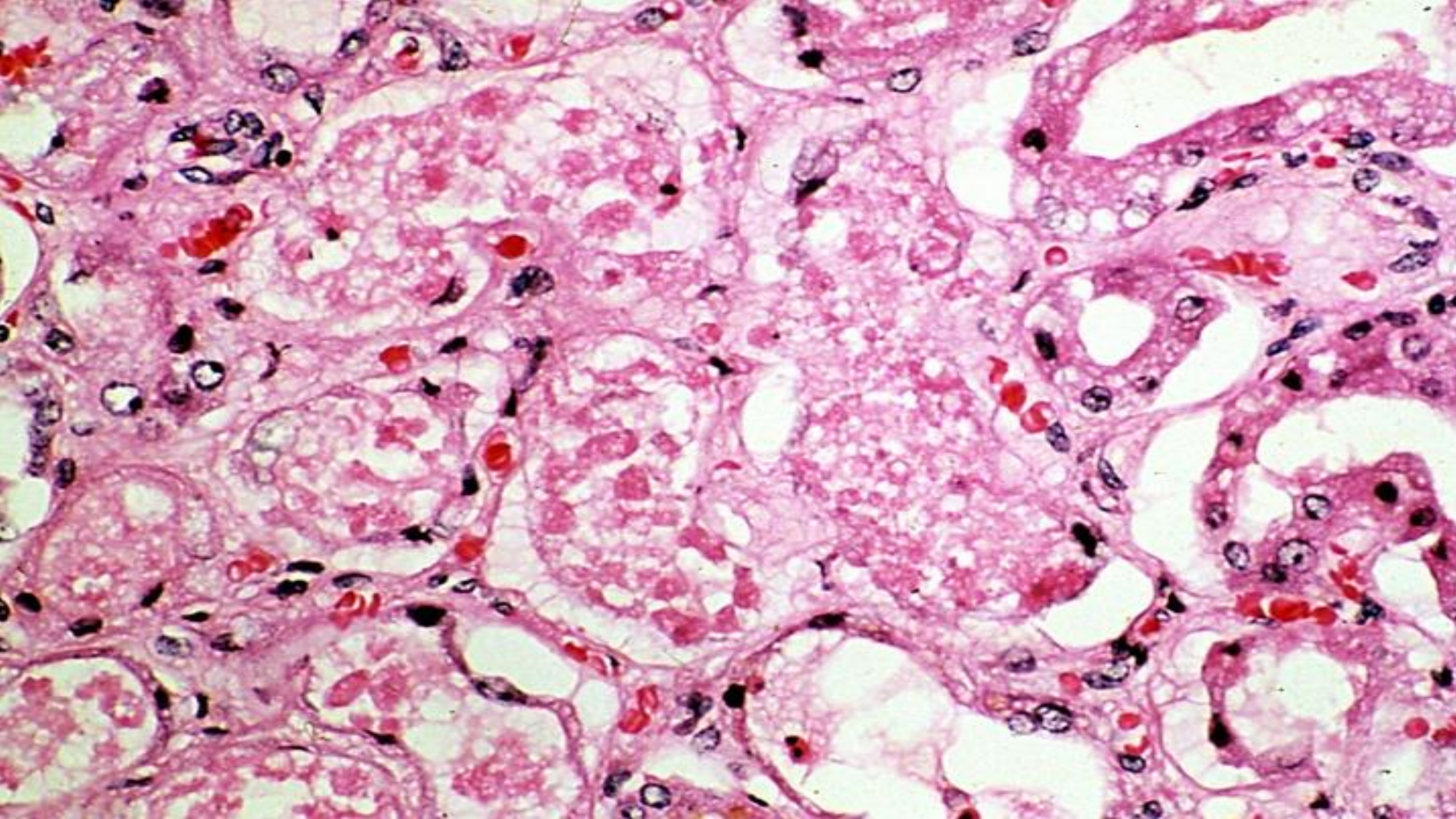


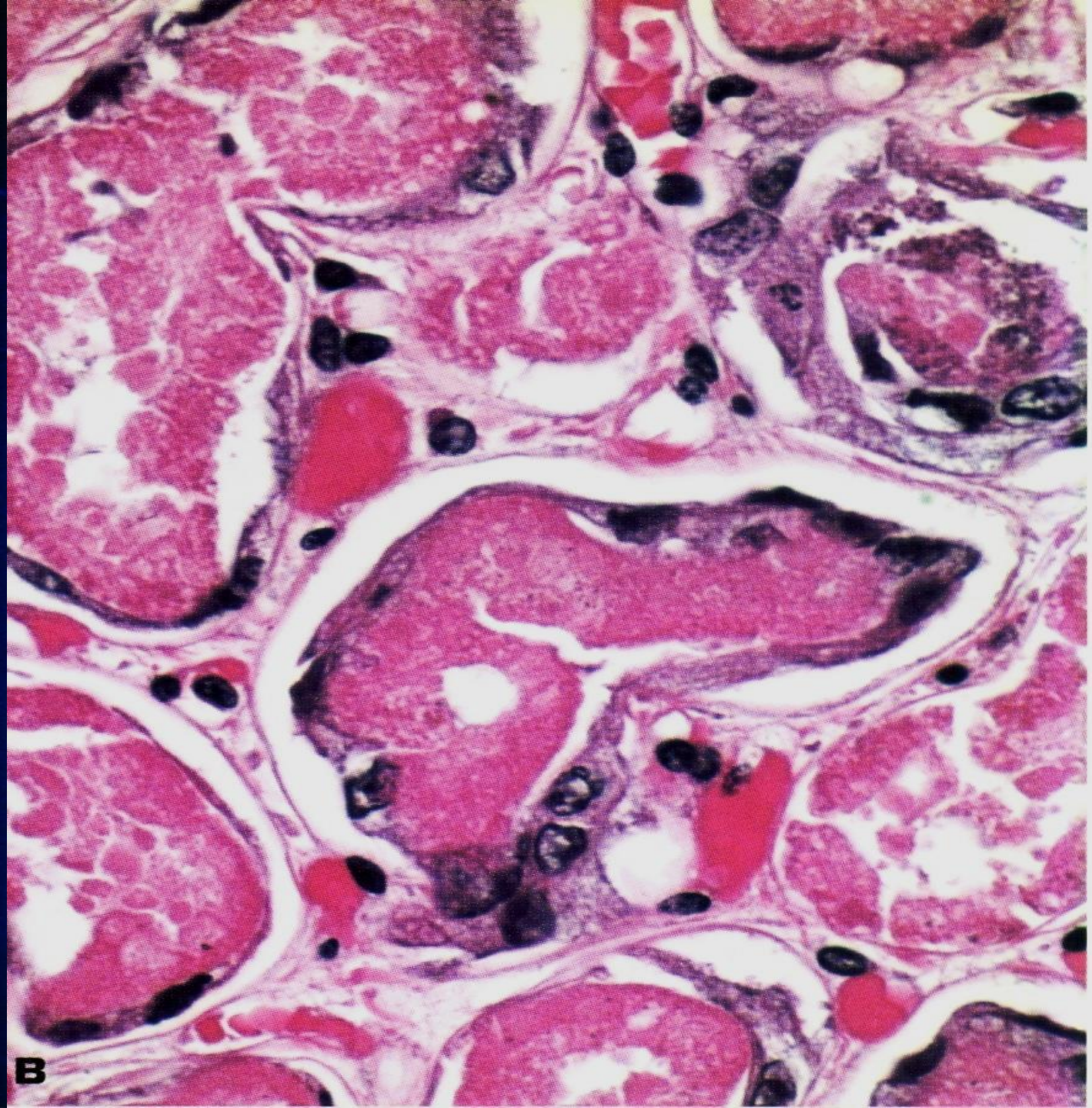
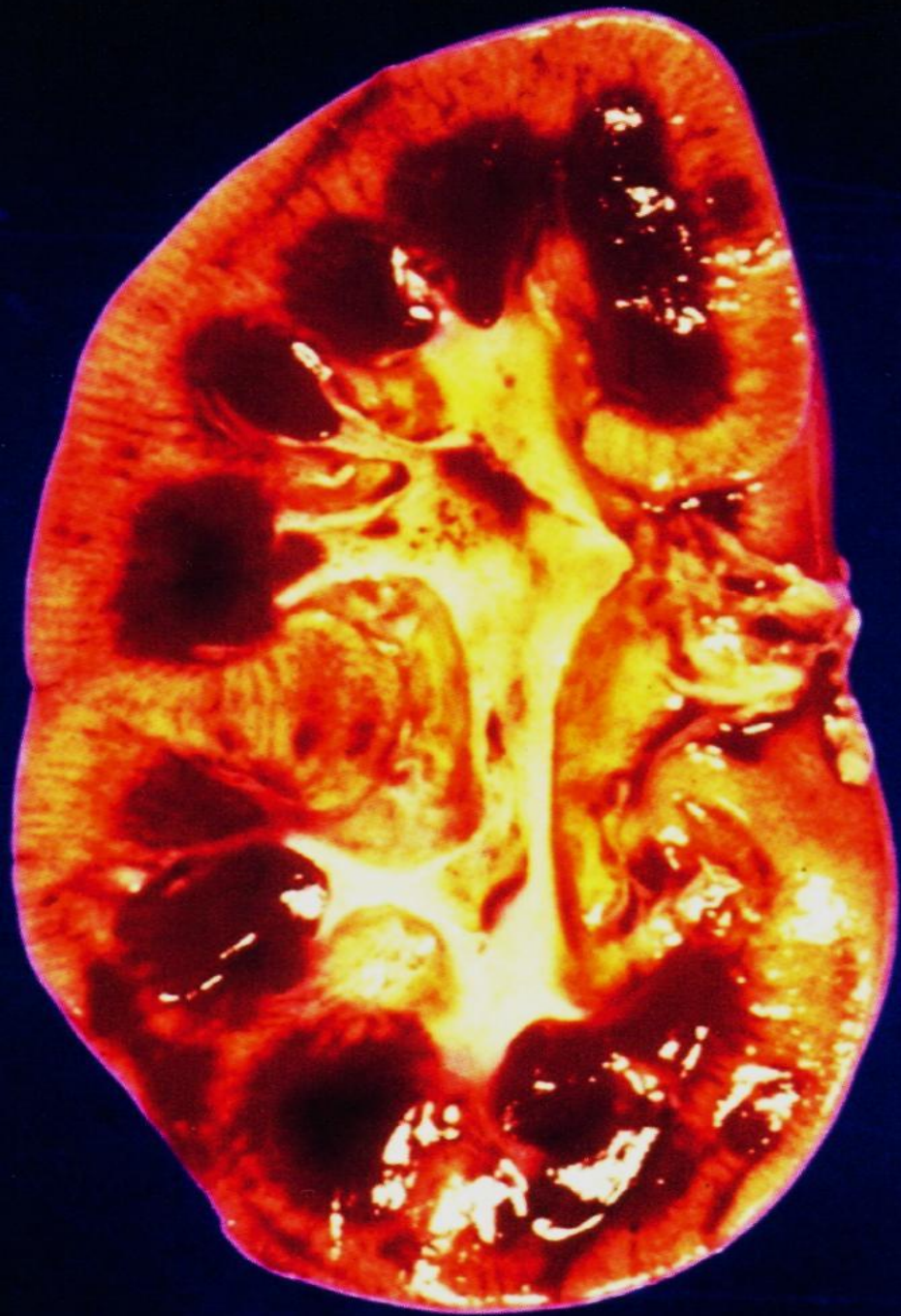
TOXIC TYPE

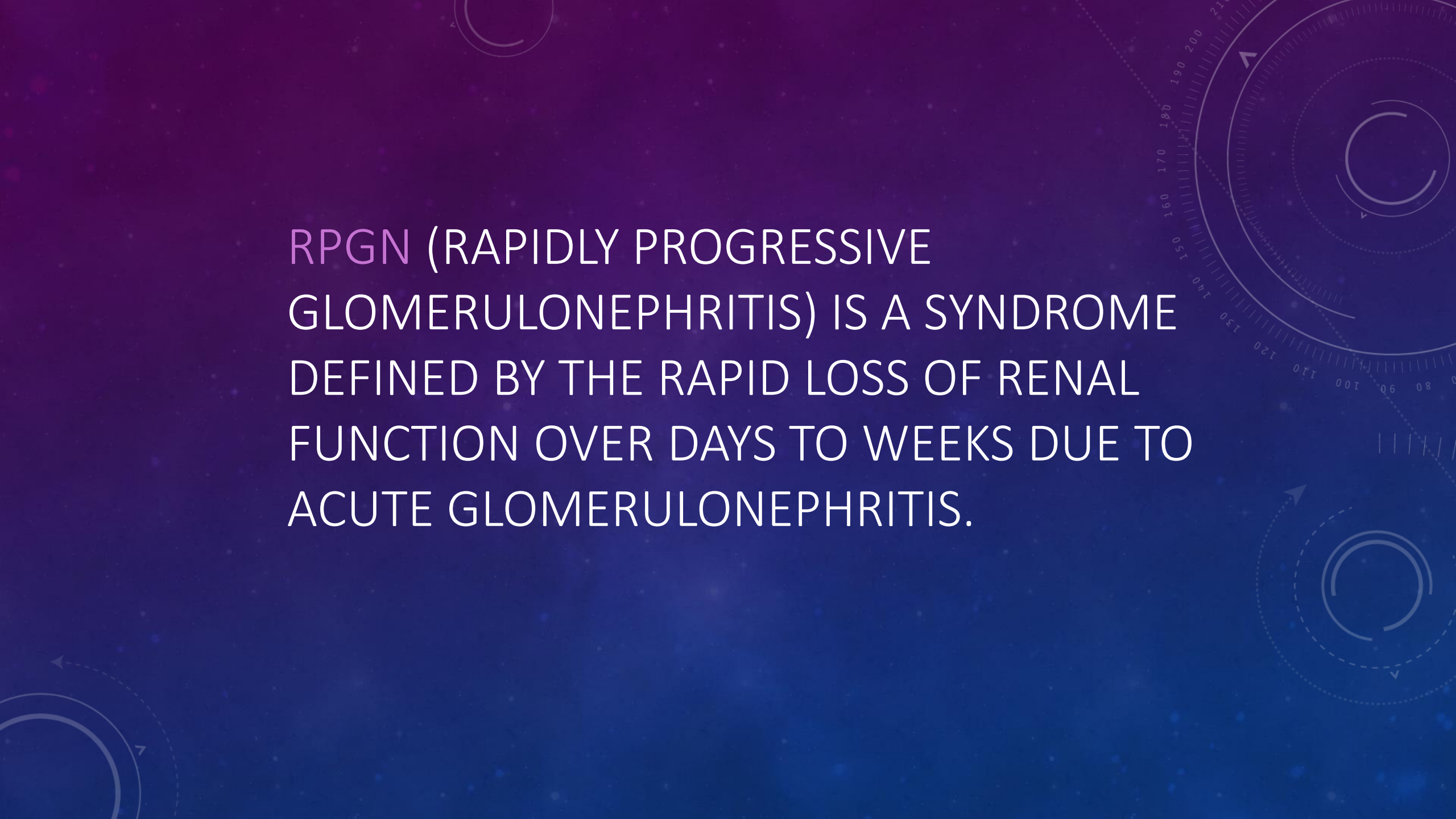


ATN :
Acute tubular necrosis

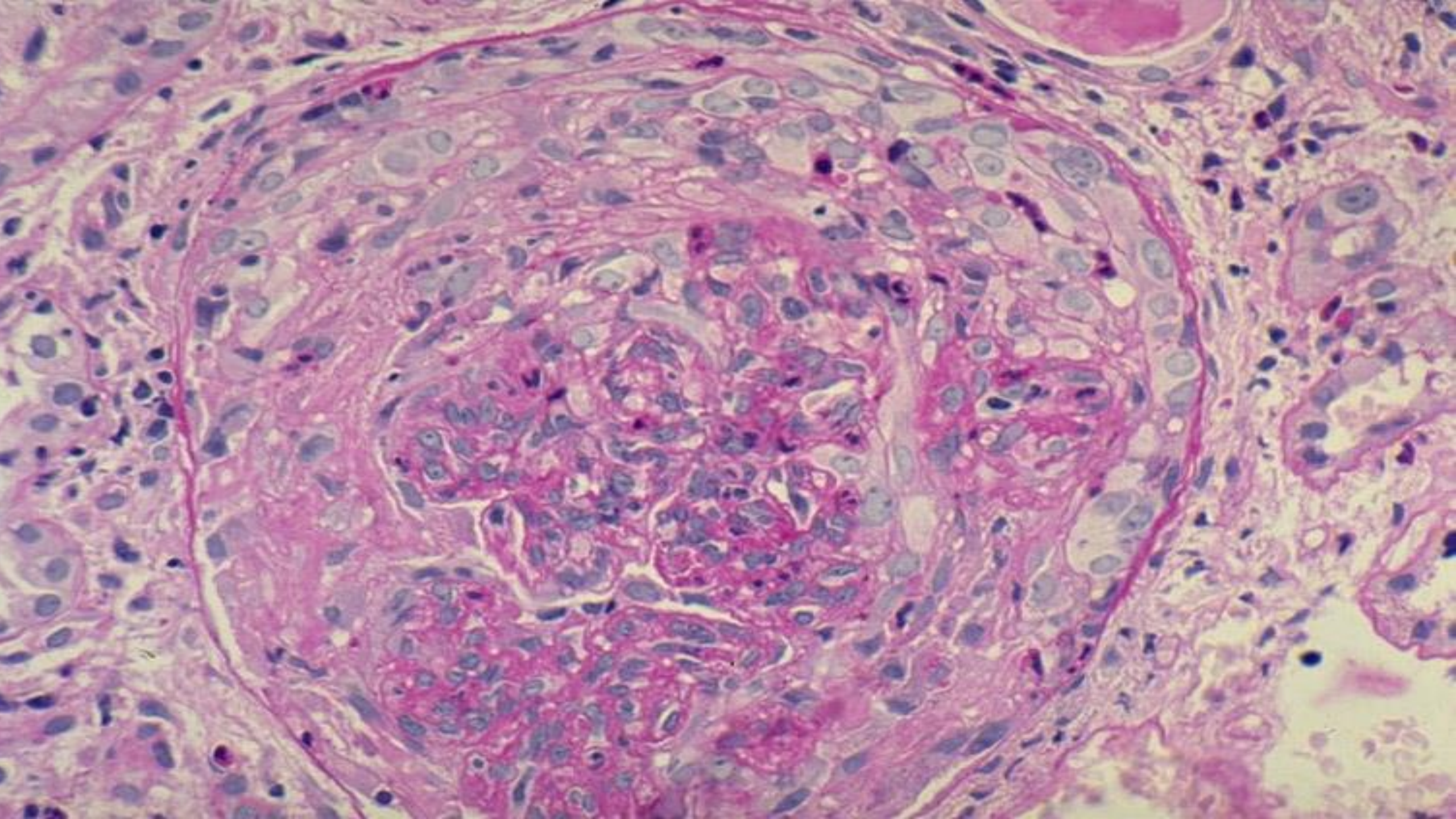
	Casts
	Necrosis





The background is a dark blue gradient with faint, glowing technical graphics. On the right side, there are several circular gauges or dials with numerical scales (e.g., 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210) and arrows. There are also some dashed lines and smaller circular elements scattered across the background.

RPGN (RAPIDLY PROGRESSIVE GLOMERULONEPHRITIS) IS A SYNDROME DEFINED BY THE RAPID LOSS OF RENAL FUNCTION OVER DAYS TO WEEKS DUE TO ACUTE GLOMERULONEPHRITIS.



ACUTE KIDNEY INJURY

- Homework :
- 1- Autosomal dominant polycystic kidney disease
- 2- Autosomal recessive polycystic kidney disease
- 3- Renal dysplasia