

### Chronic kidney Disease

#### Definition:

- Gradual loss of kidney function
- Advanced disease can cause dangerous levels of fluid, electrolytes & wastes build up in the body
- Also called chronic kidney failure
- Black, Native American & Asian American are more at risk

#### Risk factors/causes:

- Diabetes
- Hypertension & cardiovascular diseases
- Glomerulonephritis
- Polycystic kidney disease (inherited)
- Smoking & drug abuse
- Obesity
- Age
- Family Hx of kidney disease

**Pathophysiology & mechanism:** Causes → ↓ number of nephrons → activation of vasoactive mediators, cytokines, RAAS, growth factors → structural & functional changes of surviving nephrons → hyperfiltration → ↑ intraglomerular capillary pressure → accelerated sclerosis of remaining nephrons → ↓ number of nephrons

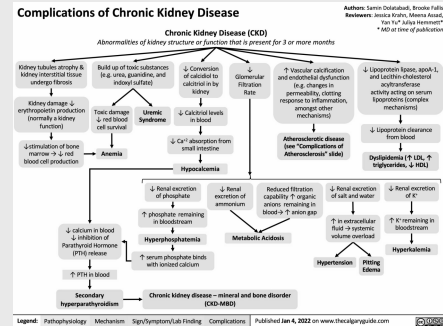
#### Signs & symptoms:

- Nausea/vomiting
- Loss of appetite
- Frequent/difficulty urinating
- Foamy urine
- Ammonia-smelling breath
- Fatigue & weakness
- Ankle & feet swelling
- Anaemia
- Hypocalcaemia (↓ calcium)
- Hyperphosphatemia (↑ phosphate)
- Metabolic acidosis
- Hyperkalaemia (↑ potassium)

**Treatment:** Medication or surgery (kidney transplant)

### Chronic Kidney Disease

#### Complications of Chronic Kidney Disease



### Glomerulonephritis

**Definition:** Inflammation & damage of the tiny filters (glomeruli) in the kidneys (autoimmune origin)

#### Risk factors/causes:

- Infections
- Autoimmune
- Vasculitis
- Sclerotic conditions
- Inherited
- Cancers

#### Signs & symptoms:

- Nausea/vomiting
- Fatigue
- Less urination
- Pink or cola-coloured urine
- Foamy urine
- Hypertension
- Oedema (fluid retention)

#### Complications:

- Accumulation of wastes or toxins in the bloodstream
- Poor regulation of essential minerals & nutrients
- Loss of red blood cells
- Loss of blood proteins

**Treatment:** Therapies for associated kidney failure

### Nephritic Syndrome

**Definition:** Inflammation of the glomeruli (glomerulonephritis) & renal dysfunction

**Risk factors/causes:**

- Immunological (IgA nephropathy, tend to occur post-infection)
- Within the course of autoimmune disease (*Lupus nephritis*)
- Kidney disease (causes by many different bacteria, viruses, fungi, parasites, systemic, etc.)

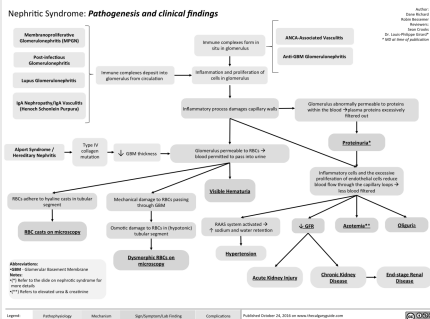
**Pathophysiology & mechanism:** Deposition of immune complexes (antibody + antigen) or antibodies triggers inflammation with leukocyte infiltration → injurs cells & degrades the glomerular basement membrane (GBM) → leakage of erythrocytes (RBC) + some proteinuria → S/Sx

**Signs & symptoms:**

- Blurred vision
- Hypertension
- Oliguria (low urine output)
- Haematuria (blood in urine)
- Proteinuria
- Azotemia (↑ levels of nitrogen-containing substance)

**Treatment:** Medication & surgery (kidney transplant)

### Nephritic Syndrome



### Diabetic Nephropathy

**Definition:** Glomerular loss (glomeruli [filtration] malfunction) & secondary disease to diabetes

**Risk factors/causes:**

- Hyperglycaemia (↑ blood sugar)
- Hypertension
- Smoking
- Obesity
- Family Hx of diabetes & kidney disease
- ↑ blood cholesterol

**Pathophysiology & mechanism:** ↑ glucose levels → ↑ blood volume, pressure & renal perfusion → damages the blood vessels (form glomeruli) → leaky vessels → extravasation of blood proteins (spilt into the capsule)

**Signs & symptoms:**

- Nausea
- Loss of appetite
- Fatigue/insomnia
- Swollen ankles, feet & hands
- Dry/itchy skin
- Difficulty concentrating

**Treatment:** Medication or surgery (kidney transplant)

### Diabetic Nephropathy

