

First Stage → Pronephros

* From the Cranial part of Intermediate mesoderm.

7-8 Nephrotomes → Nephrocele → pronephric tubules

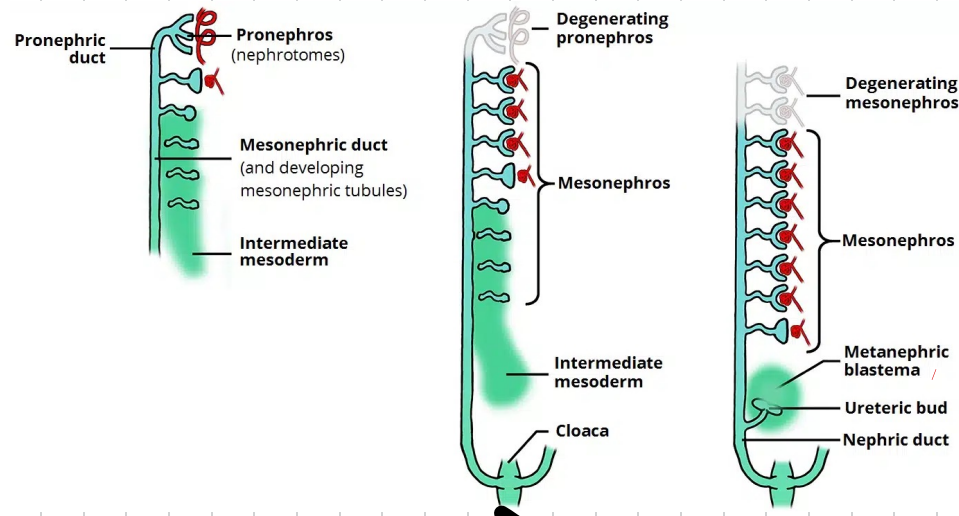
elongated & Open in the cloaca (No excretory function) ← Inter embryonic coelom ← Dorsal end
 remain to be mesonephric duct but the tubules disappear completely ← Ventral end

Second Stage → Mesonephros (Wolffian)

7-8 Nephrotomes → Nephrocele → Mesonephric tubule

has excretory function Open in mesonephric duct ← Dorsal end
 each tubule elongated & innervated by branch from dorsal Aorta forming ← Ventral end
 Vascular Glomerulus

	Tubules	Duct
♂	Cranial → Appendix Epididymis Middle → Vasa deferentia Caudal → Paraepididymis	epididymis, Vas deferens, Seminal Vesicle, ejaculatory duct Trigone of Urinary bladder, Ureteric bud
♀	Cranial → Epooophoron Caudal → Paraepiohron	Gartner's cyst in the Vaginal wall Trigone of Urinary bladder, Ureteric bud



Third Stage → Metanephros, permanent kidney

* before the disappearance of Mesonephros by 5th Week

the Metanephros start its development

1. Ureteric bud from mesonephric duct = Ureter - Renal pelvis - Major calyces
 Minor Calyces - Papillae - Collecting tubules

grows upward, backward & inside caudal part

of metanephric cap ((Opposite lower L.S. Sinal))

Dorsal end contact with collecting tubules → **Wolffian Canalization**
 Ventral end invaginated by **interstitial tissue** → forming glomerulus, Bowman's capsule, PCT, DCT, loop of hale

* **Agenesis** :- 1. Failure of development of Ureteric bud - No Ureter & kidney -
 2. Failure of contact of Ureteric bud & Intermediate mesoderm

May be Unilateral or Bilateral → Oligohydramnios

* **Polycystic** :- Failure of Canalization between DCT & CT

* **Horseshoe** :- Fusion of lower poles of both kidneys * Present by 14th week

* **Rosette + Cake shaped** :- Fusion of both upper & lower poles * remain in the pelvis

* **Aberrant renal artery** :- Persistent during ascent enter through lumbar

* **Accessory renal artery** :- Additional artery enter through lower pole

* **Pelvic kidney** :- Failure of the ascent

* **In complete ascent** :- Ascent but not reaches the terminal position

* **Ectopic kidney** :- Abnormal Ascent.

* **Mobility (Movable) kidney** :- Not fixed in Post Abdominal wall / lead in torsion of renal Artery **Pott's disease**

* **Mal rotation** :- Wilms directed laterally, Ureter and renal vessels pass in front of the kidney.

* **Post caval Ureter** :- pass behind IVC lead in the obstruction of the Ureter.

Abnormalities of the position

Bifid Ureter & One kidney :- Splitting of distal end of Ureteric bud after contact to intermediate mesoderm

Unilateral double kidney & double Ureters :- Two Ureteric buds arise before contact to intermediate mesoderm

Unilateral double kidney & One Ureter :- Complete division of the distal end of Ureteric bud before contact to intermediate mesoderm

Double Ureter & Single kidney :- The Ureteric bud splits completely after contact to intermediate mesoderm