The gonad (testis or ovary) begins as a genital ridge.
Germ cells migrate into the genital ridge.
Germ cells trigger formation of, then populate the primitive sex cords.
The paramesonephric duct is added by invaginating the peritoneal mesothelium. The superior end remains open to the peritoneal cavity.
An apparently indifferent genital system is temporarily present at 6 weeks of gestation. Male and female phenotypes diverge thereafter.
Male vs. Female Gonad Formation

44 + XY
Y influence
Testis
Medullary cords develop
No cortical cords
Thick tunica albuginea

44 + XX
Absence of Y
Ovary
Medullary cords degenerate
Cortical cords develop
No tunica albuginea

Indifferent gonad
FIG. 17-22  The differentiation of the male phenotype.
Female (top) and Male (bottom) Gonad Formation
Further formation of the male ducts.
The male ducts enter the prostatic urethra.
Further formation of the female ducts.
Formation of the broad ligament in the female.
The fused paramesonephric ducts join the urethra.
The vagina is formed from the paramesonephric ducts and sinovaginal bulb.
Formation of the uterus from the paramesonephric ducts.

- **A**: Uterus didelphys with double vagina
- **B**: Uterus arcuatus
- **C**: Uterus bicornis
- **D**: Uterus bicornis unicollis, 1 rudimentary horn
- **E**: Atresia of cervix
- **F**: Atresia of vagina
The external genitalia are indifferent through the 12th week.
Male/Female – week 9 (left)
Female – week 12 (right)
Hypospadius

Glanular hypospadias

Penile hypospadias

Penoscrotal hypospadias (with chordee)

Scrotal hypospadias (bifid scrotum, chordee)

Abnormal urethral orifices

Hypospadias
Descent of the Testes into the Scrotum

- 7th week:
  - Peritoneum
  - Subserous fascia
  - Transversalis fascia
  - Transversus abdominis m.
  - Internal oblique m.
  - External oblique m.
  - Gubernaculum

- 8th week:
  - Processus vaginalis
  - Abdominal musculature
  - Ductus deferens
  - Epididymis
  - Cremasteric fascia and muscle
  - Ext. Int. spermatic fascia
  - Tunica vaginalis
  - Obliterated sac
  - Connection between peritoneal cavity and tunica vaginalis
  - Hydrocele

- 12th week:
  - 8th month:
  - Level of deep ring
  - Level of superficial ring
  - 9th month:
  - Deep ring
  - Superficial ring
Descent of the Testis in the Male
Derivatives of the Gubernaculum in the Female
Epispadius & Extrophy of the Bladder 2
Abnormal Development of the Genital System

- Male pseudohermaphrodites are genetic males with a feminized phenotype. Female pseudohermaphrodites are genetic females with a masculinized phenotype (hyperplastic suprarenal cortex can make androgens).

- Male pseudohermaphrodites can result from failure to produce adequate testosterone/dihydrotestosterone or just dihydrotestosterone.

- Male pseudohermaphrodites can also result from androgen insensitivity in responding tissues.

- True hermaphrodites (rare) may be XX/XY mosaics with ovotestes.
The End