DOG CRYPTORSIDIDISM

🧬 Causes of Canine Cryptorchidism

1. Genetic Origin

- **Hereditary trait**, likely **polygenic**, meaning multiple genes contribute.
- Common in certain breeds: **Toy Poodle, Yorkshire Terrier, Chihuahua, Boxer**.

2. Hormonal Imbalance

- Insufficient **testosterone surge** may impair gubernaculum development, which helps testicle descent.

3. Gubernacular or Inguinal Canal Abnormalities

- **Mechanical failure**: Narrow inguinal ring or abnormal gubernaculum prevents testicular descent.

4. Developmental Delay or Arrest

- The testicle may get "stuck" in the **abdomen**, **inguinal canal**, or **pre-scrotal area**.

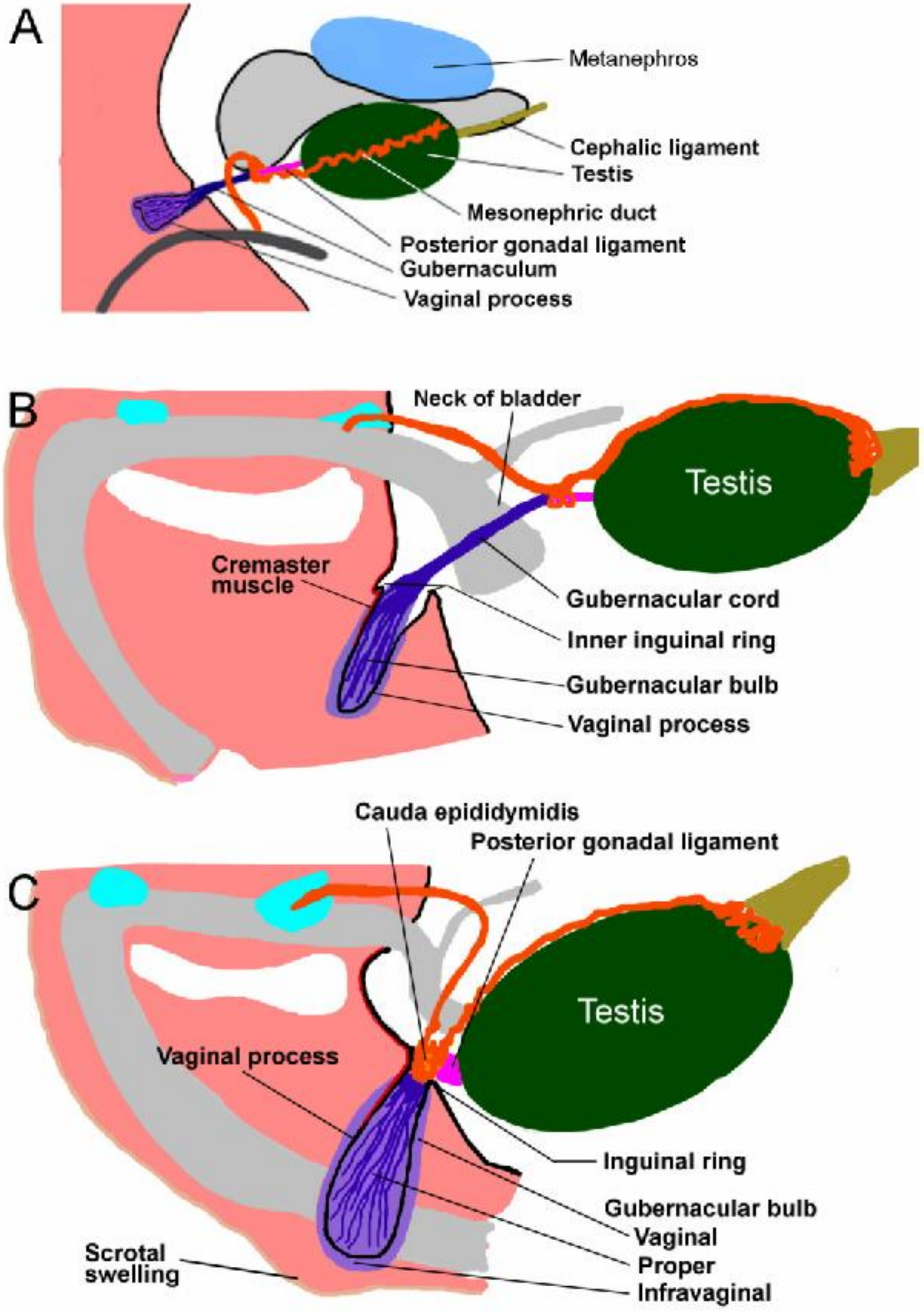
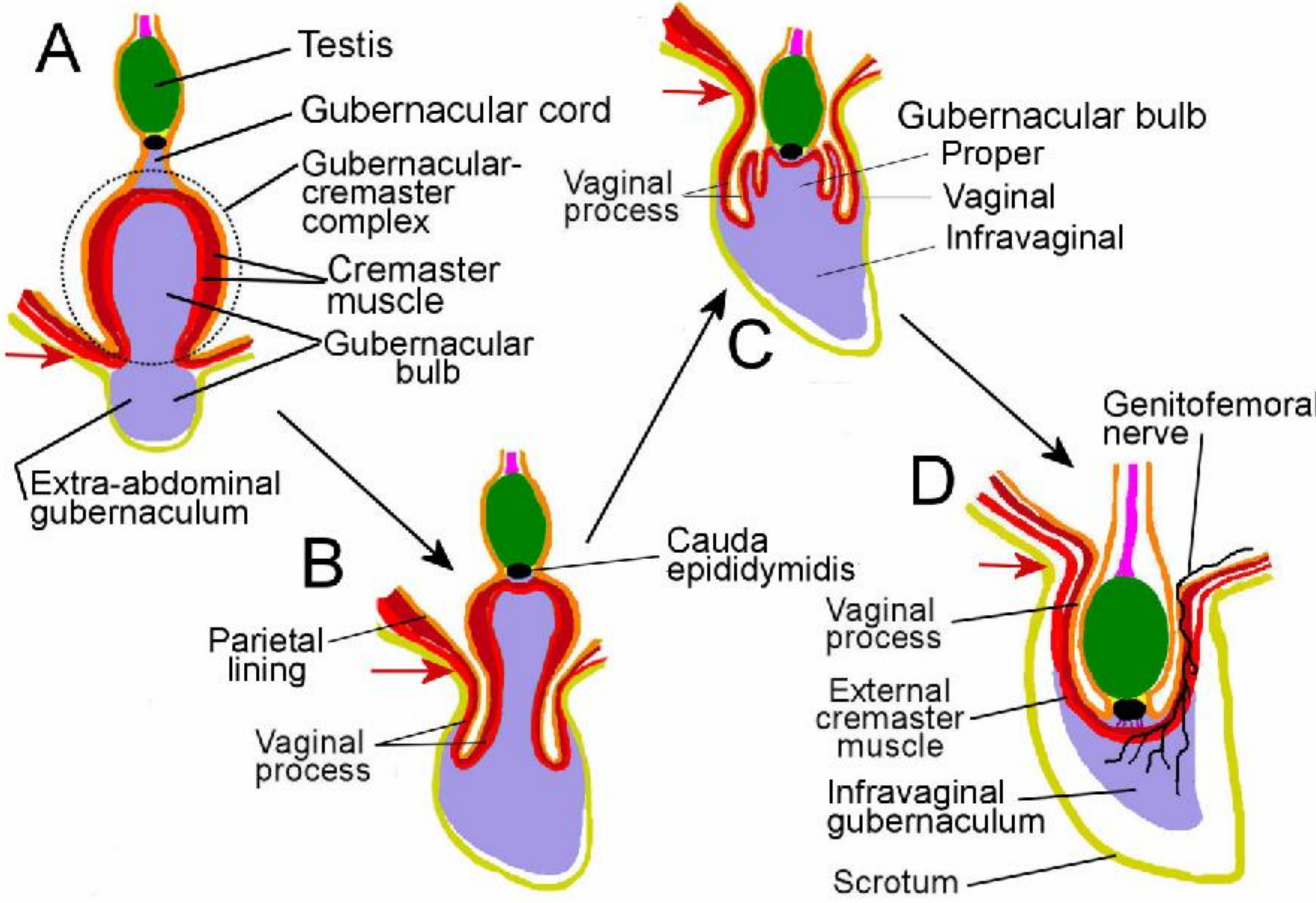
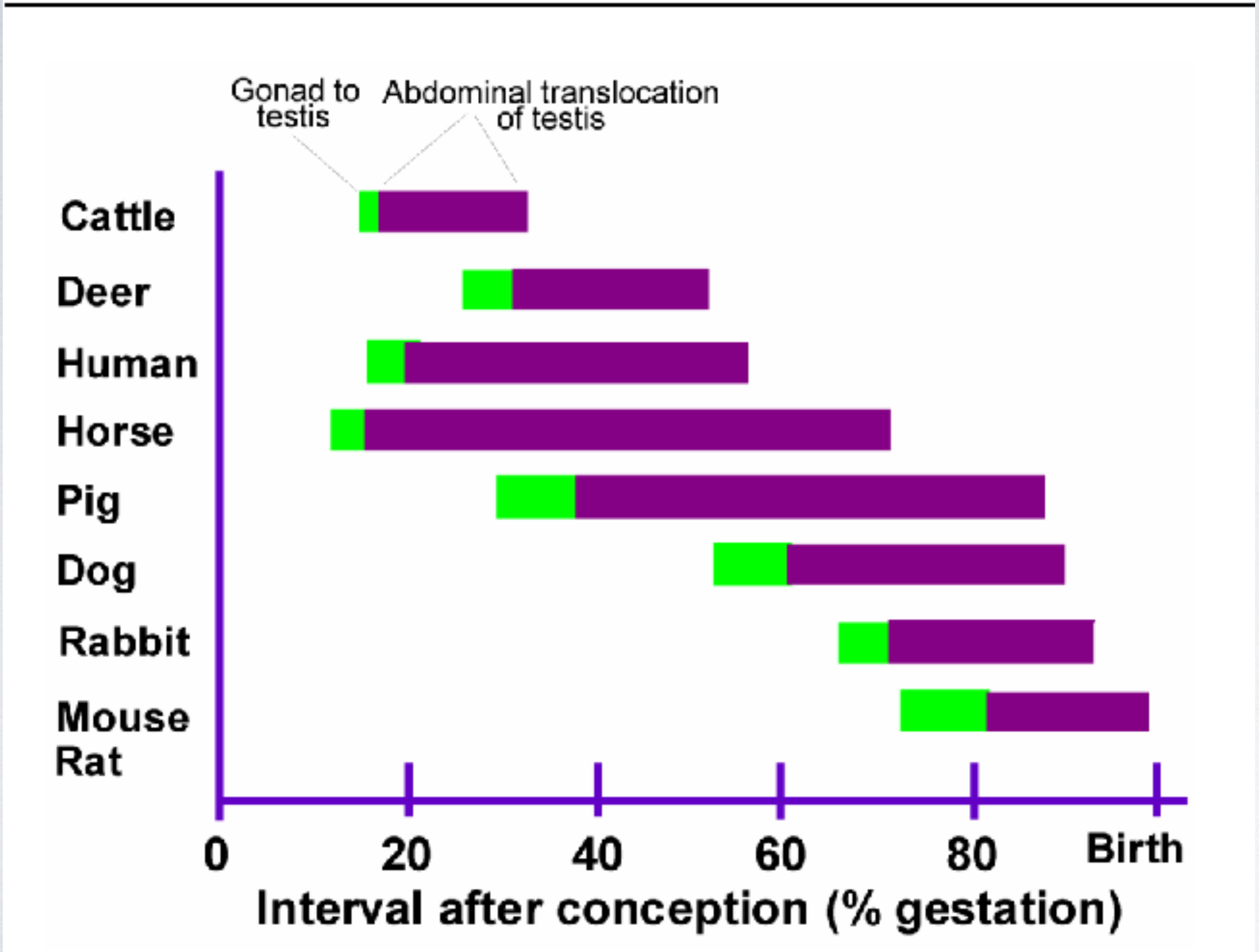


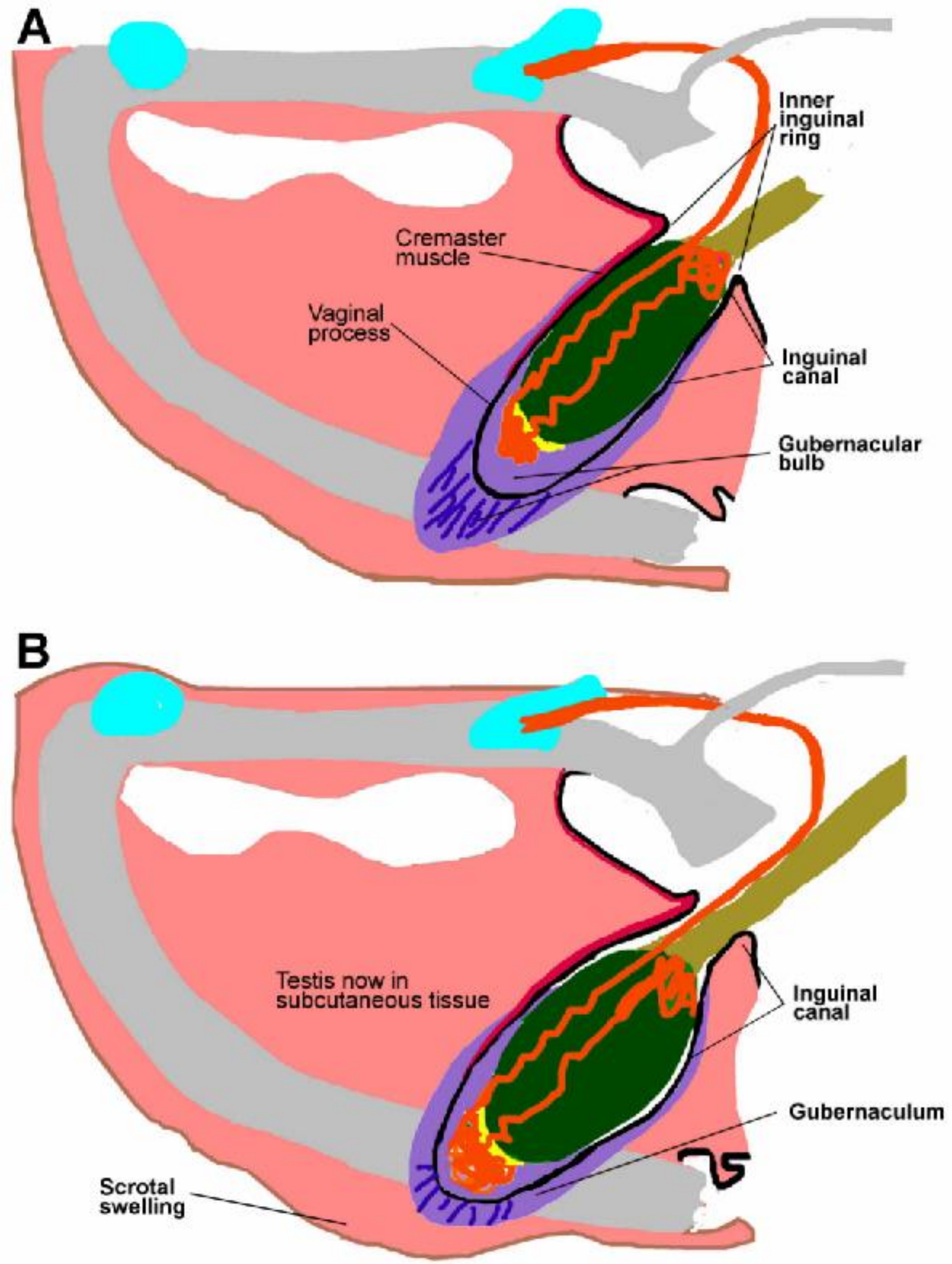
Figure 1. Abdominal translocation of the testes in a

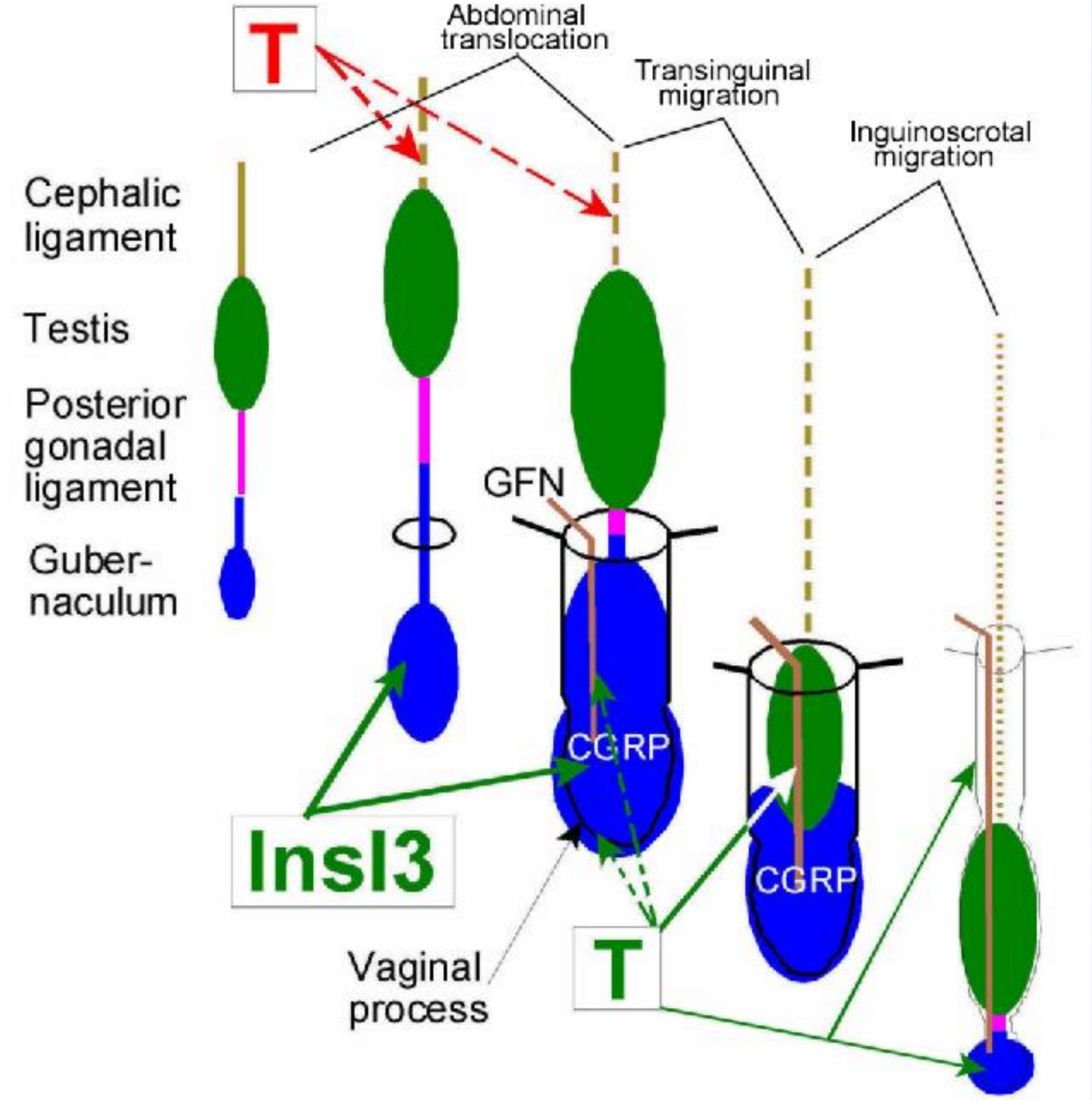




The green bar shows when the testes start forming and begin moving within the abdomen, while the purple bar shows the remaining time in gestation after this process starts — until birth."

In species like **dogs** and **horses**, the **testicular descent begins late** in gestation or even **after birth** (see long purple bars after green in your chart).
This makes them more vulnerable to any **delays, hormonal disruptions, or developmental issues**, increasing the risk of cryptorchidism.


A
Inner inguinal ring
Cremaster muscle
Vaginal process
Inguinal canal
Gubernacular bulb
B
Testis now in subcutaneous tissue
Inguinal canal
Gubernaculum
Scrotal swelling


T
Abdominal translocation
Transinguinal migration
Inguinoscrotal migration
Cephalic ligament
Testis
Posterior gonadal ligament
Guber-naculum
GFN
CGRP
CGRP
Insl3
Vaginal process
T

Species	Gestation Length (days)	Testis Differentiation Starts (% Gestation)	Abdominal Translocation Period	Descent Complete	Cryptorchidism Risk	Notes
Cattle	~281	~15–20%	Early (~20–35% gestation)	Prenatal	Low	Testes descend early in utero
Deer	~203	~15–20%	~20–50%	Prenatal	Low	Similar to cattle
Human	~268	~20%	~20–60%	Prenatal	Moderate	Sensitive to endocrine disruptors
Horse	~337	~15–20%	Long (~20–75%)	Postnatal (up to 2 weeks)	High	Common in colts; long translocation time
Pig	~114	~20–25%	~25–60%	Prenatal	Low	Efficient descent
Dog	~60	~25–30%	~30–75%	Postnatal (by 6 weeks)	High	Most common species for cryptorchidism
Rabbit	~31	~25–30%	~30–85%	Postnatal (~10 wks)	Moderate	Testes may move back/forth before puberty
Mouse/Rat	~20	~25–30%	~30–85%	Postnatal	Moderate	Used in endocrine disruption studies

📊 Testicular Descent Finalization by Species

Species	Descent Finalized	Timing Relative to Birth
Cattle	~240–260 days gestation	Prenatal
Deer	~170–190 days gestation	Prenatal
Human	~32–36 weeks gestation	Prenatal
Horse	By 14 days after birth	Postnatal
Pig	~90–105 days gestation	Prenatal
Dog	By 6 weeks after birth	Postnatal
Rabbit	10–12 weeks after birth	Postnatal
Mouse/Rat	5–10 days after birth	Postnatal

DIAGNOSTIC

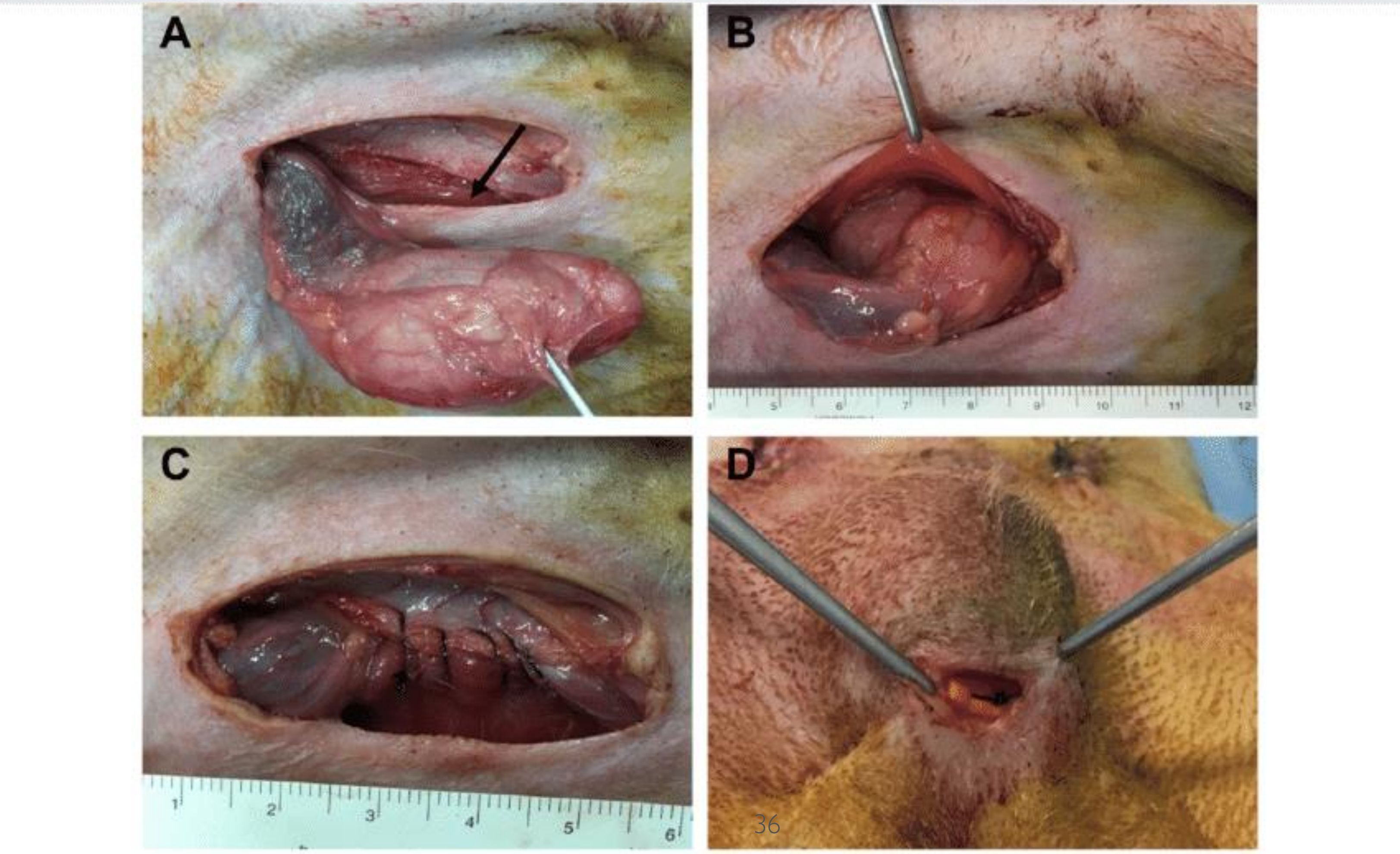
Ultrasound

Palpation

📋 Diagnostic Methods for Cryptorchidism in Animals

Species	Clinical Exam	Hormonal Testing	Imaging	Surgical/Other
Dog	Palpation (inguinal, scrotal)	**hCG stimulation**, **AMH**, **testosterone**	**Ultrasound**, CT, X-ray (rare)	Diagnostic laparotomy or laparoscopy
Cat	Palpation	**hCG stimulation**, **testosterone baseline**	**Ultrasound**	Surgical exploration
Horse	Palpation (inguinal rings)	**hCG or GnRH stimulation test**	**Ultrasound**, Nuclear scintigraphy	Laparoscopy or surgical exploration
Cattle	Usually diagnosed at castration	Rarely required	Rarely used	Often found during breeding soundness exam
Pig	Palpation (pre-scrotal area)	Not routinely tested	Rarely performed	Diagnosed during routine exams or surgery
Rabbit	Palpation (testes move freely)	Not standard	May use ultrasound	Confirmed during neutering
Rodents	Observation & palpation	Not practical	Not routine	Confirmed at necropsy or dissection

TREATMENT



🧪 1. hCG Challenge Test

✅ Purpose

Stimulates **Leydig cells** to produce **testosterone** → presence confirms testicular tissue (cryptorchid or scrotal).

🐶 Dogs (commonly used)

- **Baseline testosterone**: Collect blood sample before injection.
- **Administer hCG**:
  - **Dose**: 500–1000 IU IV or IM (small dogs)
  - Up to 1500–2000 IU for large breeds
- **Post-injection sample**: 1–2 hours or up to 4 hours after injection
- **Interpretation**:
  - **>2 ng/mL** increase in testosterone → presence of testicular tissue
  - **<0.5 ng/mL** or no increase → likely castrated

🐴 Horses

- **hCG (Chorulon®)**:
  - **Dose**: 6000 IU IV
- **Post-sample timing**: 36 hours after injection
- **Threshold**:
  - Testosterone **>100 pg/mL** post-hCG = presence of testis

🧪 2. GnRH Challenge Test

✅ Purpose

Stimulates the **pituitary to release LH**, which then stimulates testosterone production from Leydig cells.

🐶 Dogs

- **GnRH analogue**: Buserelin or Gonadorelin
  - **Dose**: 0.5–1 μg/kg IV or IM
- **Sampling**:
  - **Baseline**
  - Then at 1 and 2 hours post-injection
- **Interpretation**:
  - **>2 ng/mL** rise in testosterone = presence of functional testicular tissue
  - No significant increase = likely castrated

🐴 Horses

- **GnRH (Buserelin or Gonadorelin)**:
  - **Dose**: 20–50 μg IV or IM
- **Sampling**:
  - 0 and 1 hour post-injection
- **Threshold**:
  - **>100 pg/mL testosterone** post-GnRH = testicular tissue present

🧪 Anti-Müllerian Hormone (AMH) in Cryptorchidism Diagnosis

🔬 What is AMH?

- AMH is a **glycoprotein hormone** produced by **Sertoli cells** in the **testes.**
- It plays a role in **male sexual differentiation** during embryonic development.
- In postnatal males:
  - Intact animals (with testes) → high AMH levels
  - Castrated animals → AMH undetectable or very low

Result	AMH Level	Interpretation
High	> 0.4–0.6 ng/mL	At least one testis is present (intact or cryptorchid)
Low/Undetectable	< 0.1 ng/mL	Castrated dog, no testicular tissue

🐶 AMH in Dogs

✅ **Use**

- Detect **presence of testicular tissue** in suspected **cryptorchid** or **previously castrated** dogs.

🧪 **Interpretation**

⚠️ Some overlap may occur, but generally the test is **highly sensitive and specific** (~98–99%).

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🐴 AMH in Horses

✅ Use

- Distinguish **geldings** from **cryptorchid stallions**
- Useful when testosterone response to hCG or GnRH is **equivocal**

🧪 Interpretation

Stallions and cryptorchid colts have **significantly higher** AMH than geldings.

Result	AMH Level	Interpretation
High	> 14.7 pg/mL	Cryptorchid or intact stallion
Undetectable	~0 pg/mL	Castrated gelding

✅ Advantages of AMH Testing

- Non-invasive
- No stimulation test needed
- Highly sensitive and specific
- Works even in prepubertal animals