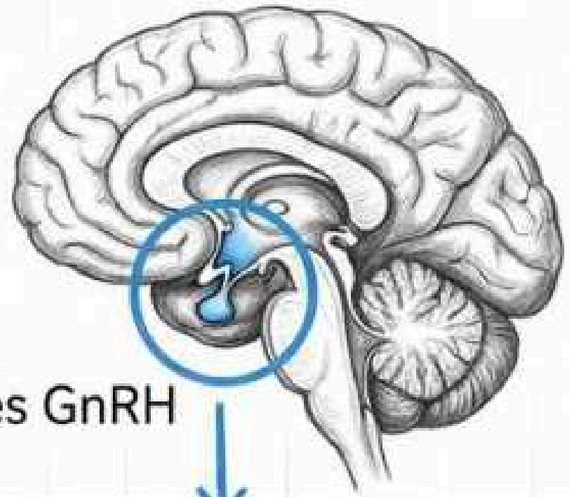
The Hypothalamic-Pituitary-Testicular Axis



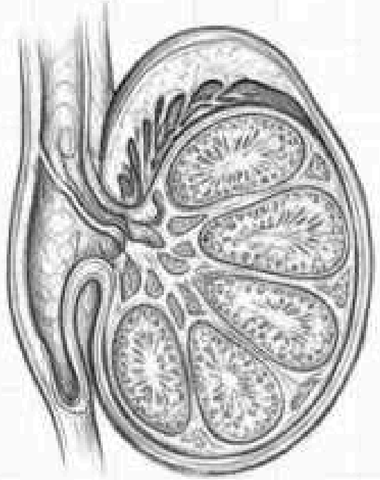
Releases GnRH

Releases LH & FSH

LH Pathway

Stimulates Leydig Cells

Produces Testosterone



FSH Pathway

Stimulates Sertoli Cells
(+ Testosterone)

Nurtures Developing Sperm

Operates as a continuous chain without a monthly cycle.

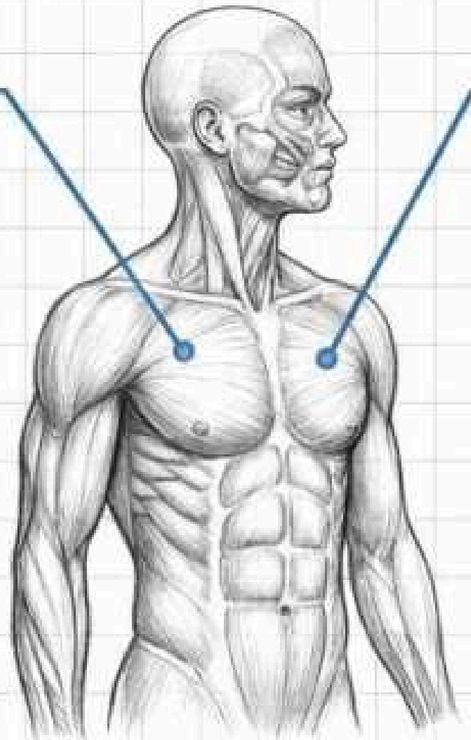
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Physiological Effects of Testosterone

Systemic Effects

Puberty

- Genital growth
- Deepening voice
- Facial/body hair
- Increased muscle mass
- Growth spurt



Adulthood

- Maintains sex drive
- Muscle and bone strength
- Red cell production
- Sperm production

Control Mechanism

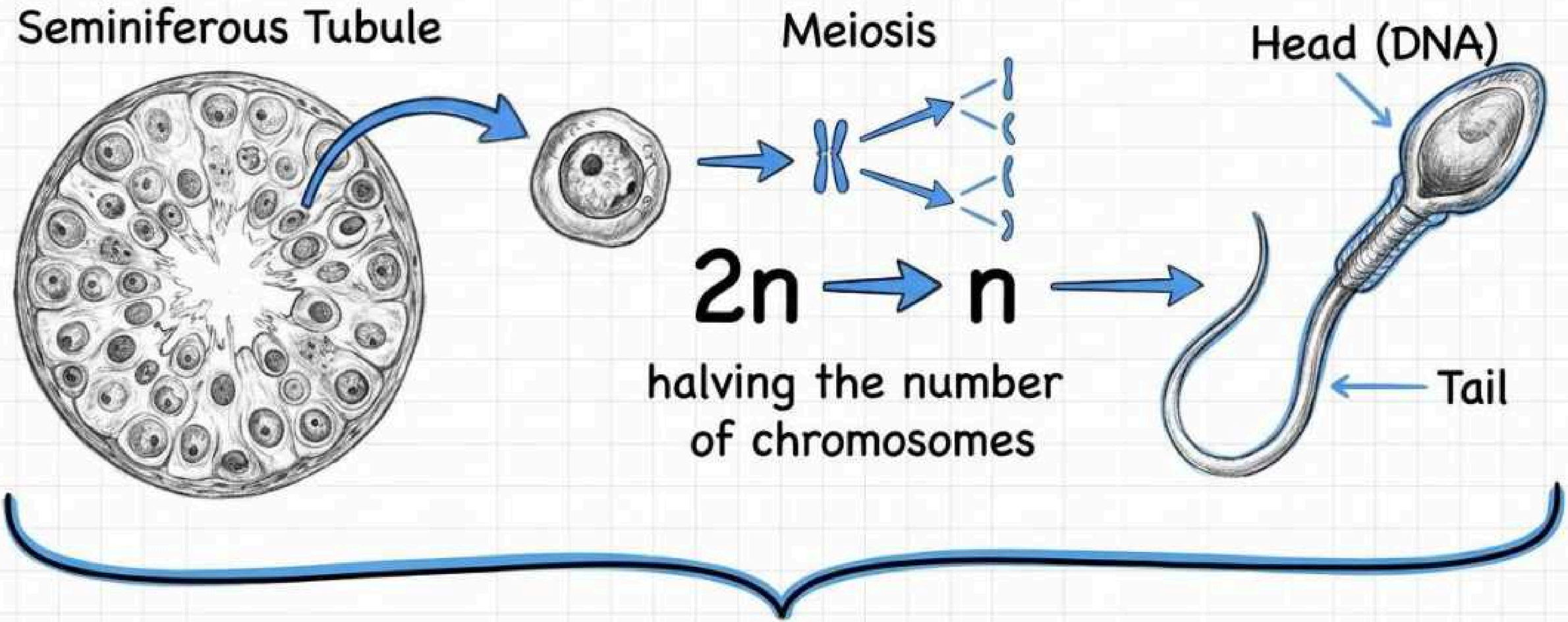
[Testosterone] ↑ → Brain Signal → [LH] ↓

(+)

(−)

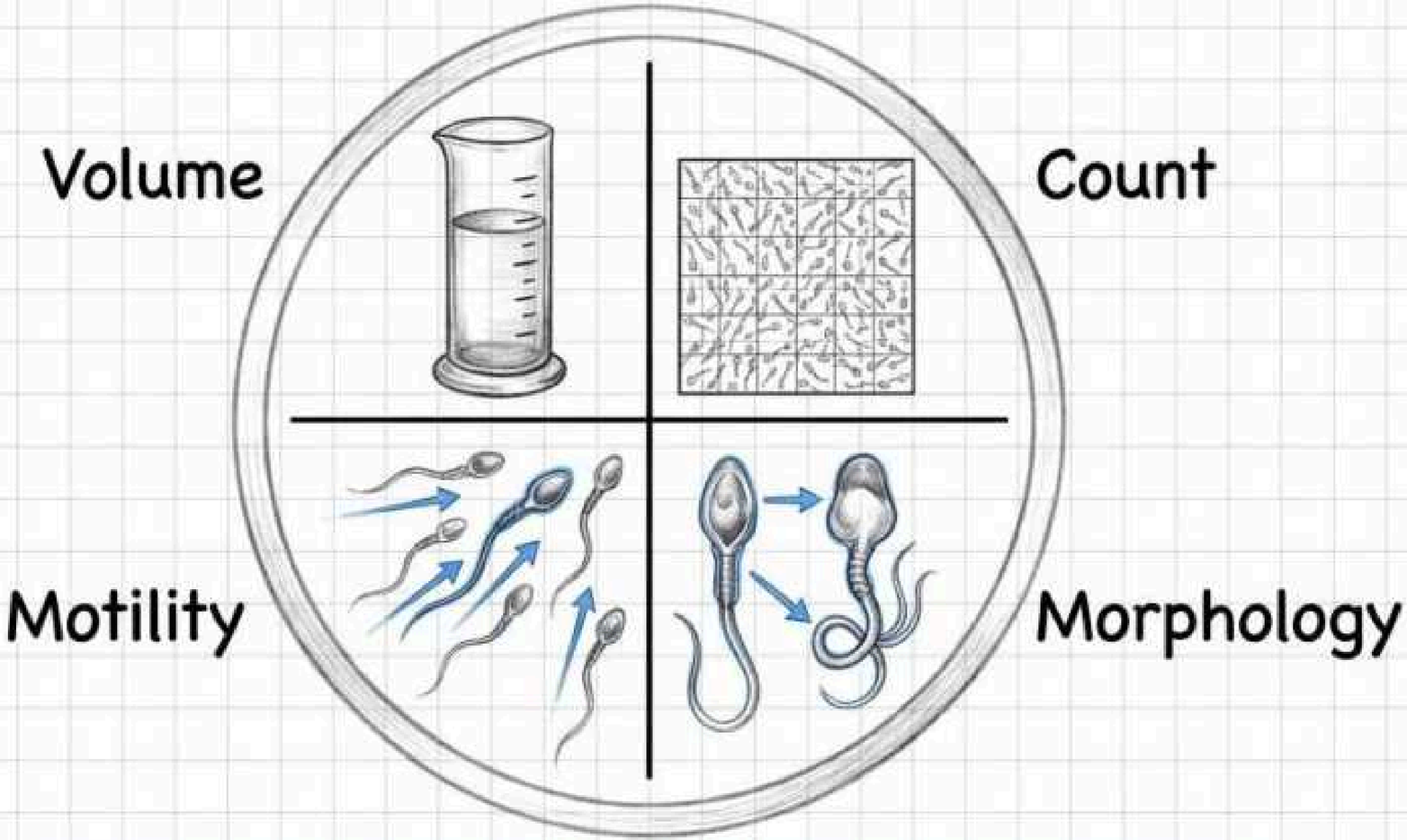
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Spermatogenesis Operates on a 70-Day Cycle



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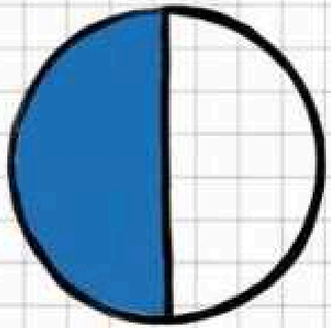
Semen Analysis Tests the Basics of Fertility



High Variance: Results vary between samples, so abnormal results are usually repeated.

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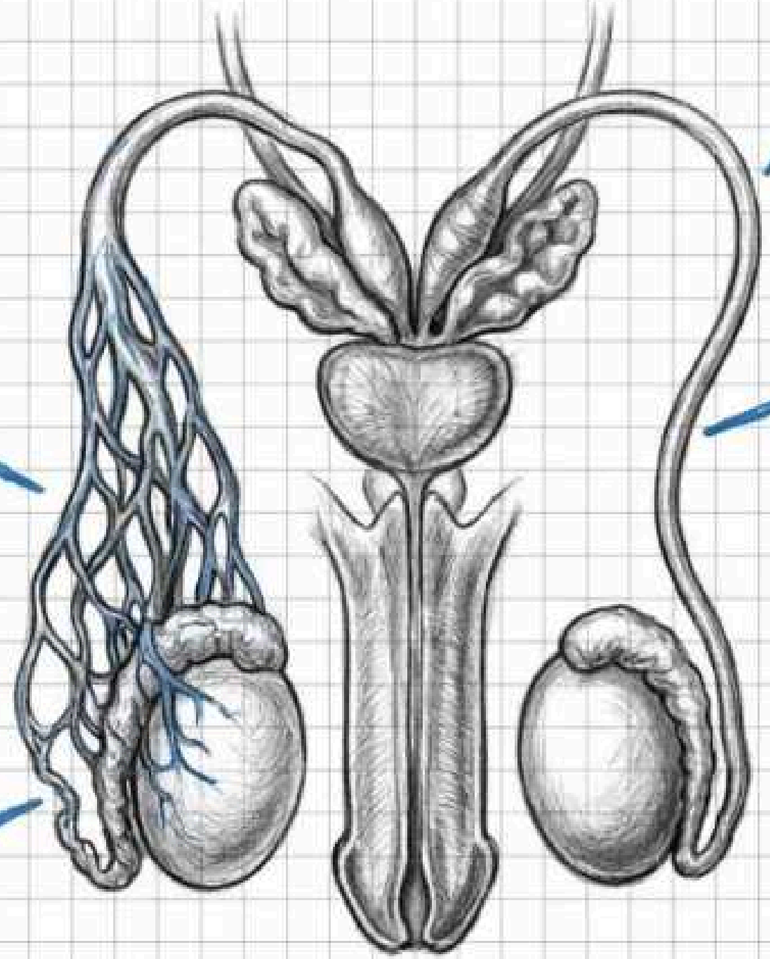
Anatomical and Systemic Etiologies of Male Infertility



Male Factors = ≈ 50% of couple infertility.

Systemic: Hormonal problems.

Veins: Varicocele



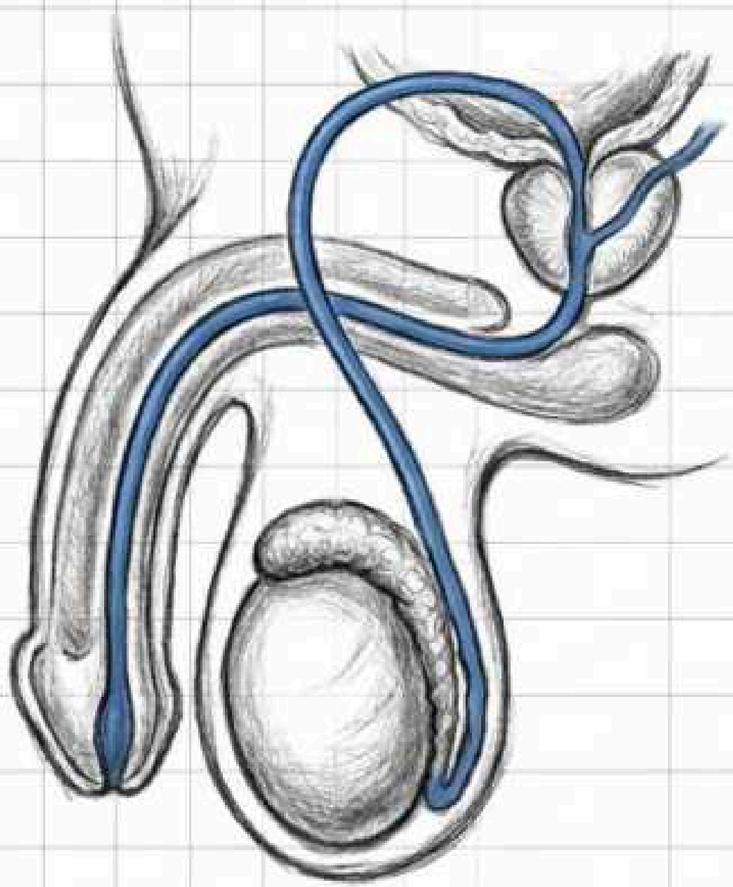
Tubes: Blockages of the transport routes.

Testes: Previous infection, undescended testes (in childhood), chemotherapy, genetic conditions.

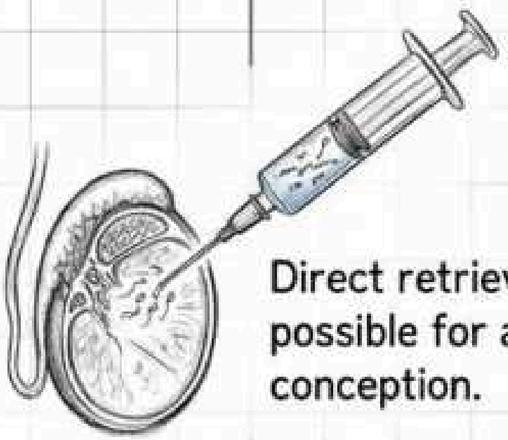
Idiopathic: In many men, no specific cause is found.

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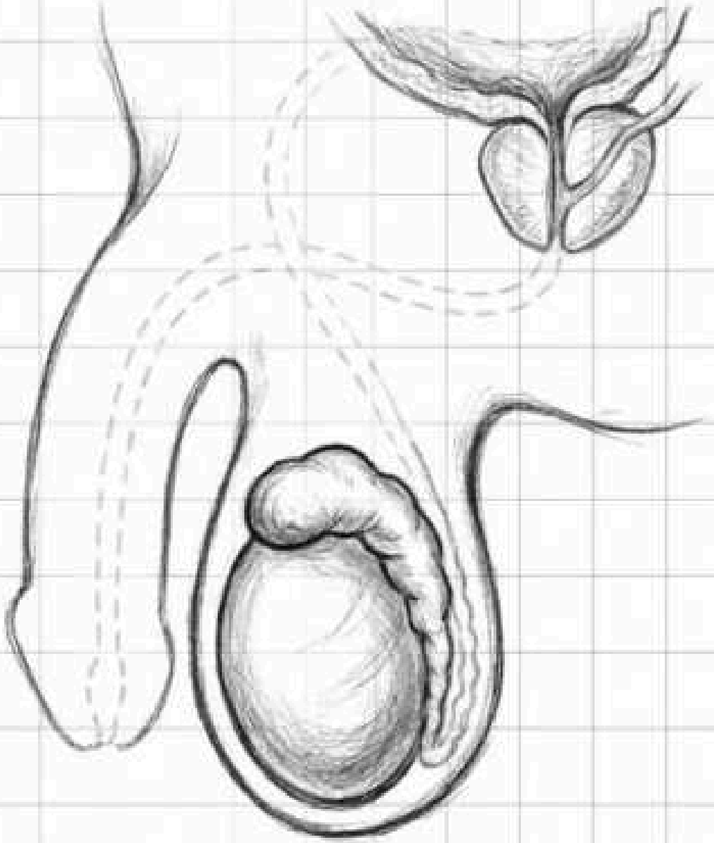
Cystic Fibrosis Blocks the Shipping Route



Sperm Factory (Testis)
= Normal Production



Direct retrieval possible for assisted conception.



Shipping Route =
Blocked / Absent

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Classifying Primary and Secondary Hypogonadism ¶ 3.7

Male hypogonadism: The testes make too little testosterone, sperm, or both.

	Primary	Secondary
Origin	Testes	Hypothalamus or Pituitary
LH/FSH Profile	High LH and FSH (↑)	Low or Normal LH and FSH (↓ / ↔)
Common Causes	Klinefelter syndrome	Severe illness, obesity, and some medicines

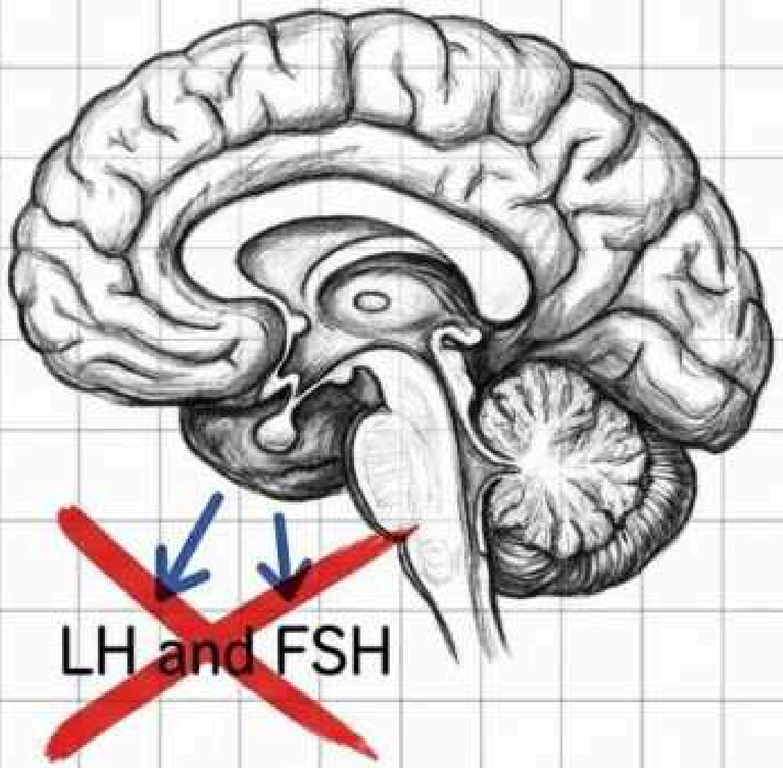
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The Exogenous Testosterone Paradox



Exogenous Testosterone
(Treatments / Anabolic Steroids used to build muscle)

(-)

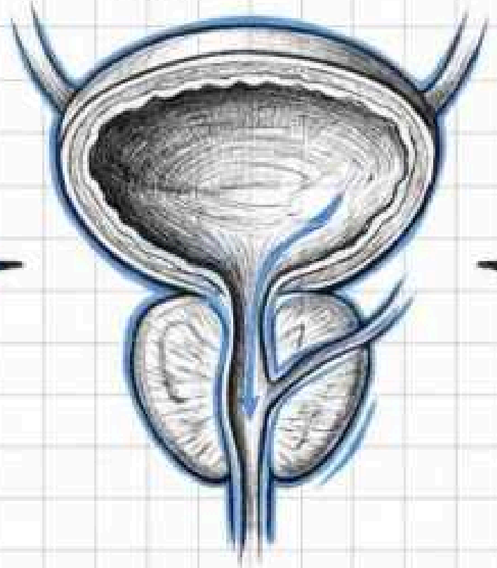


Exogenous T → [LH/FSH] = 0 → Sperm Production Shut Down → Infertility

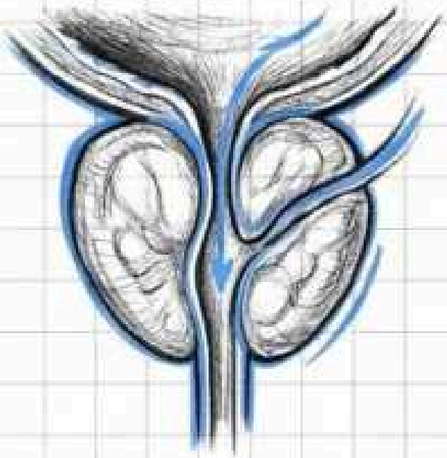
Treatment relieves genuine deficiency, but men wishing to father children must NOT be given testosterone casually.

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Aging and Pathology of the Prostate Gland



Benign Enlargement (Age-related)



- Weak stream
- Frequent urination
- Nocturia (getting up at night)

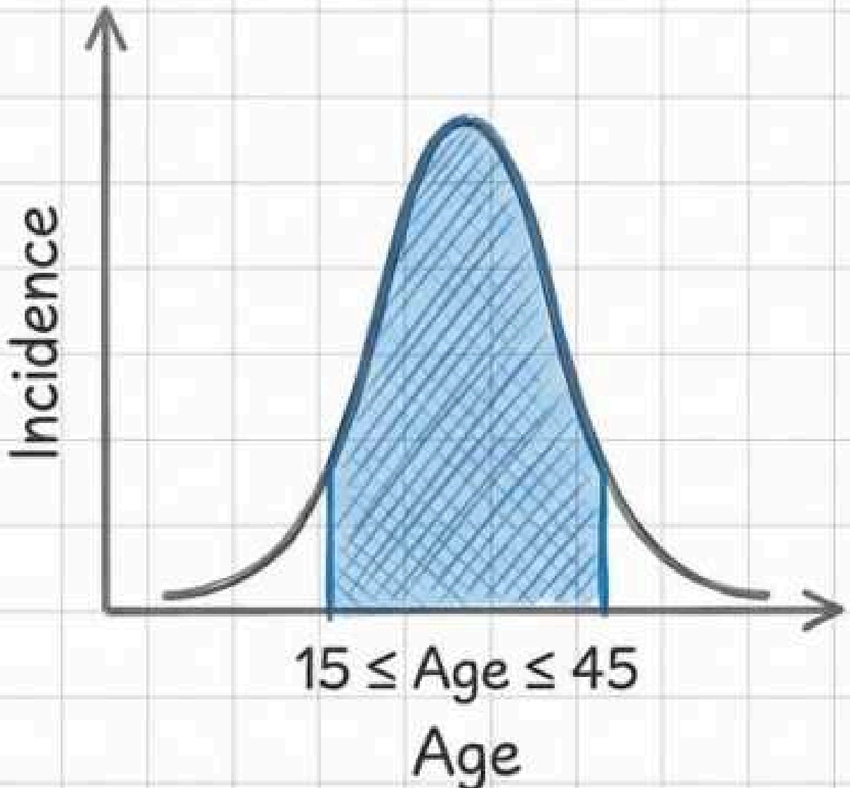
Prostate Cancer

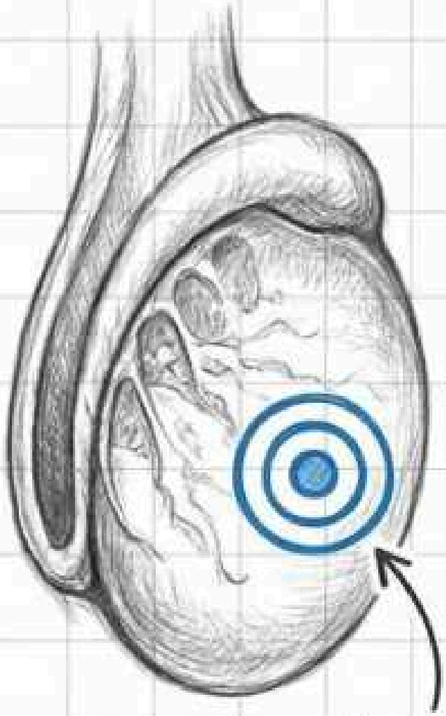
One of the commonest cancers in men; many cases grow slowly.



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Testicular Cancer Incidence and Curability





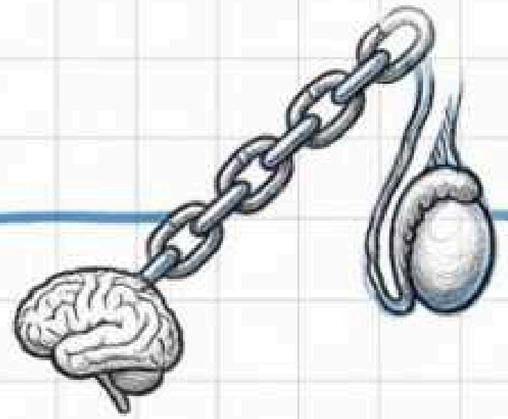
Usually presents as a painless lump

Highly curable (even with spread) due to cisplatin-based chemotherapy developed in the 1970s

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Synthesis of Male Reproductive Physiology

The Chain



Runs on the same hypothalamic-pituitary chain.

The Timeline



Sperm take ≈ 2 to 3 months to make.

The Paradox



Testosterone treatment can paradoxically cause infertility.

Next: How a new life begins.

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