

Urinary Retention and Voiding Dysfunction

History of Presenting Illness

- **Urgency** gotta go NOW
- **Frequency** (experts disagree on how often is too often)
- **Nocturia** (more than 3 times)
- **Hesitancy** (cant start going)
- **Terminal Dribbling** (cant stop going)
- **Weak Stream** (almost diagnostic of obstruction)
If they are having to perform the Valsalva manoeuvre to urinate, its very likely that the obstruction is a crude mechanical one, originating from the prostate
- **Strangury** (small stream gets through, followed by a painful desire to urinate again)
- **Pis-en-Deux** (the need to go again right after you have gone)
- **Incontinence:**

Leakage of urine is a problem for 65% of women over the age of 65.
It affects 22% of man of the same age.

DIFFERENTIALS:

[Bladder Cancer](#)
[Bladder Stones](#)
[Bladder Trauma](#)
[Chronic Pelvic Pain](#)
[Interstitial Cystitis](#)
[Neurogenic Bladder](#)
[Prostatitis, Bacterial](#)
[Prostatitis,](#)
[Tuberculous](#)
[Prostatodynia](#)
[Radiation Cystitis](#)
[Urethral Strictures](#)
[UTI](#)

Stress Incontinence

= loss of urine when pressure within the abdomen increases.
= usually described as the involuntary loss of urine while coughing, sneezing, laughing, or
= usually in women who have had several children
= weakness in pelvic floor muscles is the aetiology
Poor bladder support by the pelvic muscles results in the opening and descent of the urethra when abdominal pressure is increased. Types I, IIa, and IIb incontinence are progressive forms of this urethral "hypermobility."
Intrinsic sphincter deficiency (Type III incontinence) is another cause of stress incontinence due to a nonfunctional proximal urethra that remains open at all times.
This may be due to surgery or just getting old.

Urge incontinence

involves the sudden sensation of a need to urinate with inability to get to a toilet before involuntary leakage occurs. At times, urine may leak without any warning. This is due to an **overactive bladder** that suddenly contracts without the patient's desire for it to do so. Usually the result of ineffective descending inhibition..

Mixed incontinence is a combination of both stress and urge incontinence

Overflow incontinence

occurs when the bladder is so full that it leaks urine, or "overflows." This can happen when an enlargement of the prostate blocks the urethra
Can also happen in situations where is bladder is too weak to contract and force the urine out, such as in diabetes or certain neurologic disorders.

Environmental incontinence

is when there just isnt a toilet anywhere near you, or you are just past the point of being able to use one.

ASK ABOUT DRUGS: ones which affect the autonomic NS.

Alpha-1 noradrenaline receptors:

Pseudoephedrine can cause retention by acting as an alpha-agonist

prazosin and terazosin are alpha-antagonists, reduce tone in the bladder neck so they are used to treat patients with prostatic enlargement and associated symptoms .

M-3 muscarinic acetylcholine receptors; block them and the sphincter will not move

Ipratropium bromide = anticholinergic bronchodilator ; will cause retention in the elderly

Antidepressants – also mainly dangerous only in the elderly

Oxybutynin has some direct relaxant activity on smooth muscle as well as antagonising muscarinic receptors, having more potent anti-spasmodic effects than atropine in detrusor smooth muscle but possessing less anticholinergic activity than atropine. This drug is used to treat patients with " unstable " bladders which are thought to be due to increased bladder tone.

Bethanechol, which is a synthetic stable analogue of acetylcholine, stimulates muscarinic receptors so it contracts the detrusor muscle and initiates micturition. It can be used to treat atonic bladders.

Physical Examination

- **Assure yourself that there is nothing wrong with the external genitals**
- **Look for signs of neurological damage eg. diabetic stigma**
- **Look for scars of previous pelvic and abdominal surgery**
- **Is there a palpable distended bladder?**
- **IT WOULD BE CRIMINAL NOT TO DO A DIGITAL RECTAL EXAM**

INVESTIGATIONS: need to rule out the scariest things first

- **URINALYSIS** (blood with the above symptoms is bad news; may mean that a bladder cancer is growing over the urethra)
 - Nocturia with lots of urinary glucose may suggest diabetes
 - Leucocytes may indicate a UTI
- **Urinary Cytology:** may be of use in trying to determine source of obstruction; abnormal cells will be reported. But its not as good as a proper cystoscopic biopsy.
- **CULTURE IT if suspecting UTI**
- **EUC to exclude renal failure** as the cause OR the consequence of urinary retention
- **FBC** where the WCCs will be elevated in prostatitis
- **PSA** is where the money is: it will be elevated in BPH, prostatitis, or prostate cancer- but not bladder cancer.

International Prostate Symptom Score (IPSS): not quite an investigation, but an internationally validated means of seeing just how bad the problem is in terms of its effect on QOL. The score is a ratings system. Use it to gauge response to treatment.

IMAGING: its all a prelude to the biopsy.

BLADDER ULTRASOUND: how much are you retaining? Do we need to drain it ASAP?
AFTER voluntary voiding, do it again: WHATS THE RESIDUAL VOLUME?

TRANS-RECTAL ULTRA SOUND (TRUS): best prostate imaging there is
Can also guide the biopsy needle

CYSTOSCOPY – biopsies may be taken and the bladder walls can be imaged.

URODYNAMICS – specialised labs run tests to determine the exact point at which the obstruction is, and /or what the cause of the incontinence may be. Bladder motility may be imaged in real-time using a radio-opaque dye. Not for the amateurs.

IMAGING OF THE UPPER URINARY TRACT is indicated if the creatinine is high

MANAGEMENT: Conservative

BPH and early-stage non-invasive prostate cancer can be allowed to stew.
Provided the symptoms are under control it will not cause any further trouble; considering especially that the rate of growth is so slow and that most gentlemen with these problems present in their late 70s, it is unreasonable to push for surgery. ONE STUDY: Of all men followed for 10 years, 40% died of causes other than prostate cancer. This study was performed prior to PSA screening. (i.e the presentations were later)

MEDICATIONS:

Alpha-1-blockers: in particular Alpha-1-a

Considerable component of BPH is smooth muscle proliferation; plus the bladder muscles hypertrophy and become hypertonic. To relax these means to decrease resistance to passage of urine and to improve distension of the bladder.

Nonselective alpha-blockers include **phenoxybenzamine**.

Selective short-acting alpha-1 blockers include **prazosin, alfuzosin, and indoramin**.

Selective long-acting alpha-1 blockers include **terazosin and doxazosin**.

Partially subtype (alpha-1a)-selective agents include **tamsulosin**.

ANDROGEN ABLATION: mainly for the already-resected cancer;

- **Cyproterone acetate** (Androcur, synthetic steroid, potent antiandrogen)
- **Flutamide** (Eulexin), nonsteroidal, pure antiandrogens.
- **Finasteride** (Proscar, inhibitor of the **5- α -reductase enzyme** that prevent the conversion of testosterone into **dihydrotestosterone** (DHT) which is the active form, the one the prostate cells are so excited by.

MANAGEMENT: Radical

Indications for TURP:

- acute urinary retention,
- failed voiding trials,
- recurrent gross hematuria,
- urinary tract infection,
- renal insufficiency secondary to obstruction

TURP: risk of morbidity (18%) and mortality (0.23%). Not to be taken lightly. This procedure is performed with regional or general anesthesia. It involves the placement of a working sheath in the urethra through which a hand-held device with an attached wire loop is placed. High-energy electrical cutting current is run through the loop so that the loop can be used to shave away prostate tissue. The entire device is usually attached to a video camera to provide vision for the surgeon.

- A urinary catheter must be left in place until the bleeding has mostly cleared.
- Also, the nerves associated with erection run along the outer rim of the prostate, and the high-energy current and/or heat generated by such may damage these nerves, resulting in **impotence**.

STAGING of Carcinoma of the Prostate:

Gleason score: determined by the glandular architecture within the tumor.

2-4 = low grade or well differentiated.

5-7 = moderate grade or moderately differentiated.

8-10 = high grade or poorly differentiated.

- The predominant pattern and the second most common pattern are given grades from 1-5.
- The sum of these 2 grades is referred to as the Gleason score.
- This scoring method was found to be superior for predicting disease outcomes when compared with using the individual grades alone.

Grades are based on the extent to which the epithelium assumes a normal glandular structure. A grade of 1 indicates a near-normal pattern, and grade 5 indicates the absence of any glandular pattern (less malignant to more malignant). This scheme of grading histological features is highly dependent on the skill and experience of the pathologist and is subject to some degree of individual variation.

MANAGEMENT revolves around PROSTATECTOMY and how many nodes to take.

FOLLOWING RESECTION:

- **Androgen ablation is in order**
- **External beam radiotherapy (if side-effects allow; its mainly for the high-grade tumours which were resected with positive margins)**

EPIDEMIOLOGY

Incidence of BPH increases with age

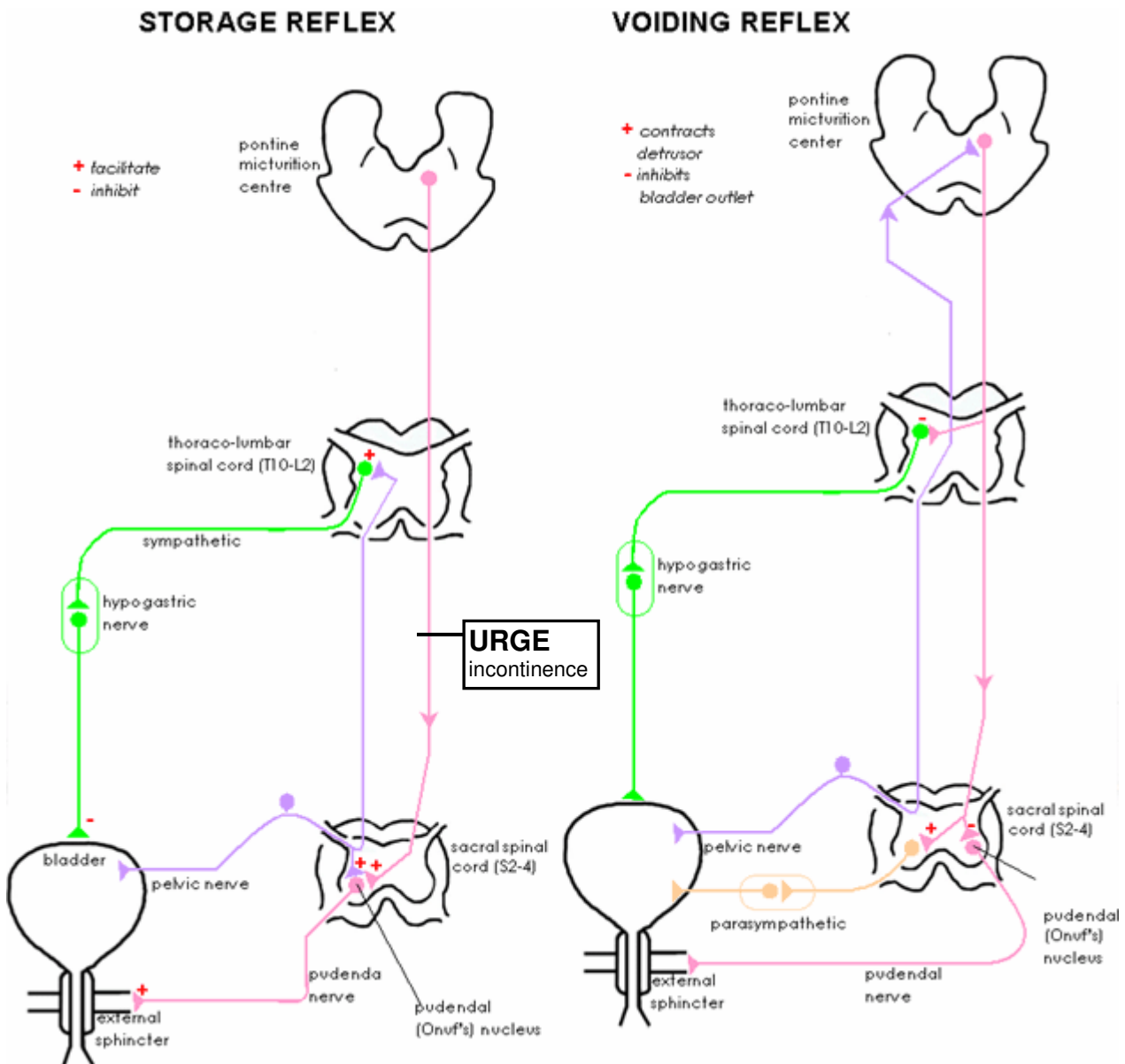
- Men aged 60 years: 50%
- Men aged 80 years: 88%

Autopsies of men in the eighth decade of life show hyperplastic changes in >90% and malignant changes in >70% of individuals

Incidence of symptomatic onset is related to ethnicity

- African american men: onset at age 60 years
- Caucasian men: onset at age 65 years

MECHANISMS OF CONTINENCE AND INCONTINENCE

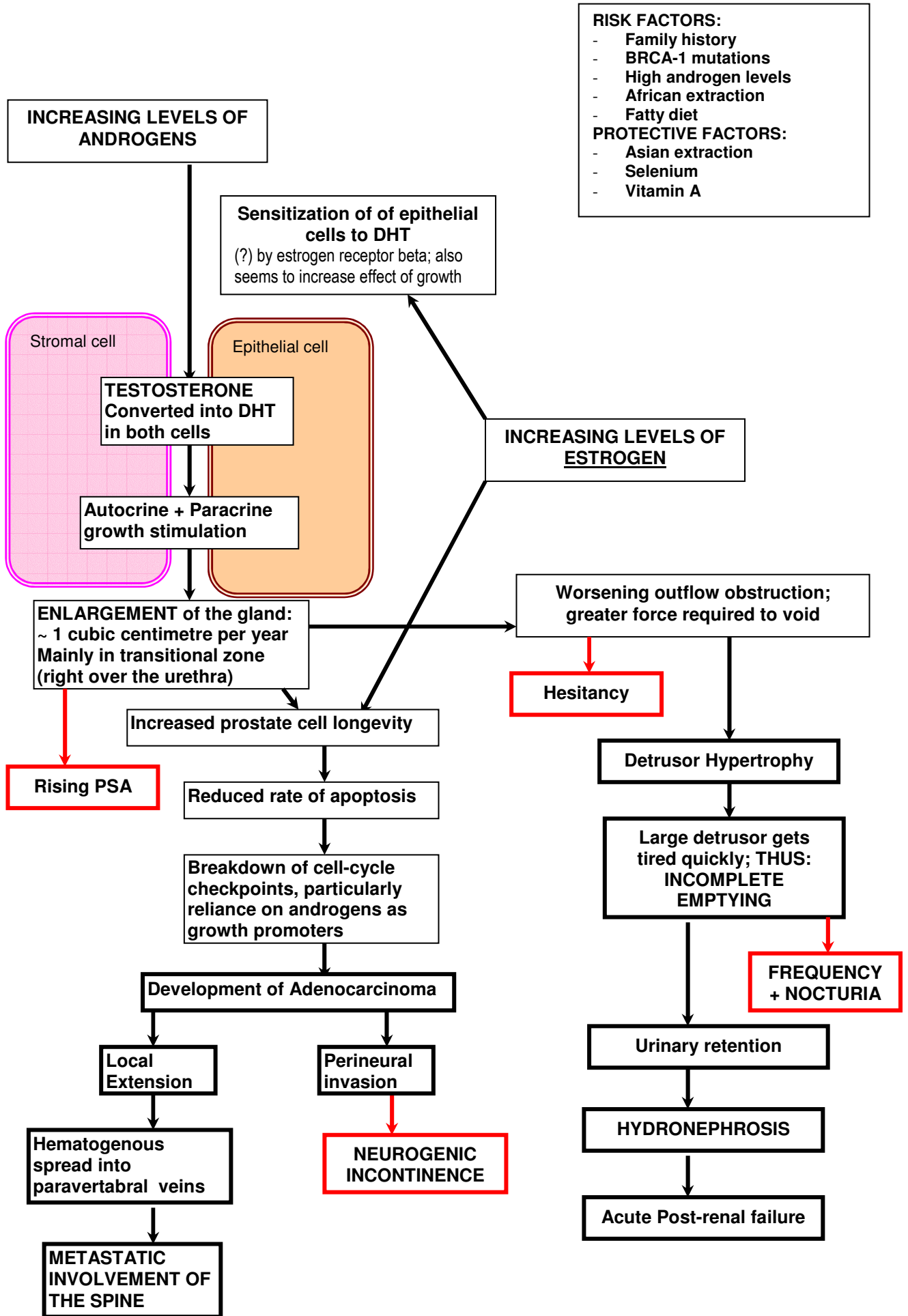


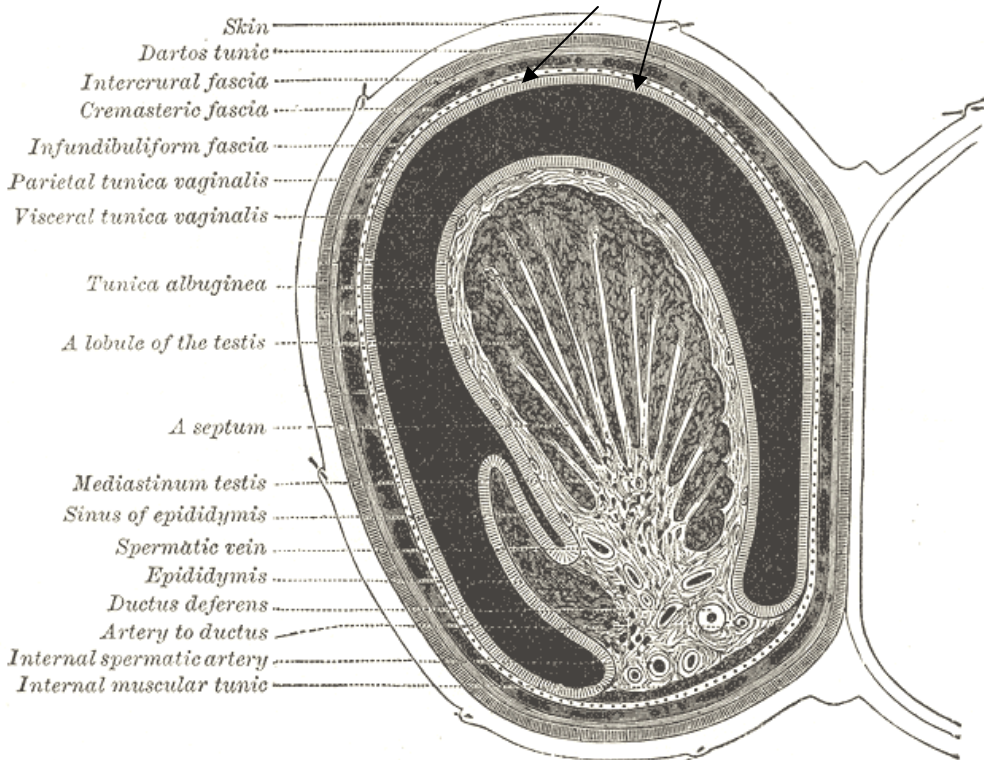
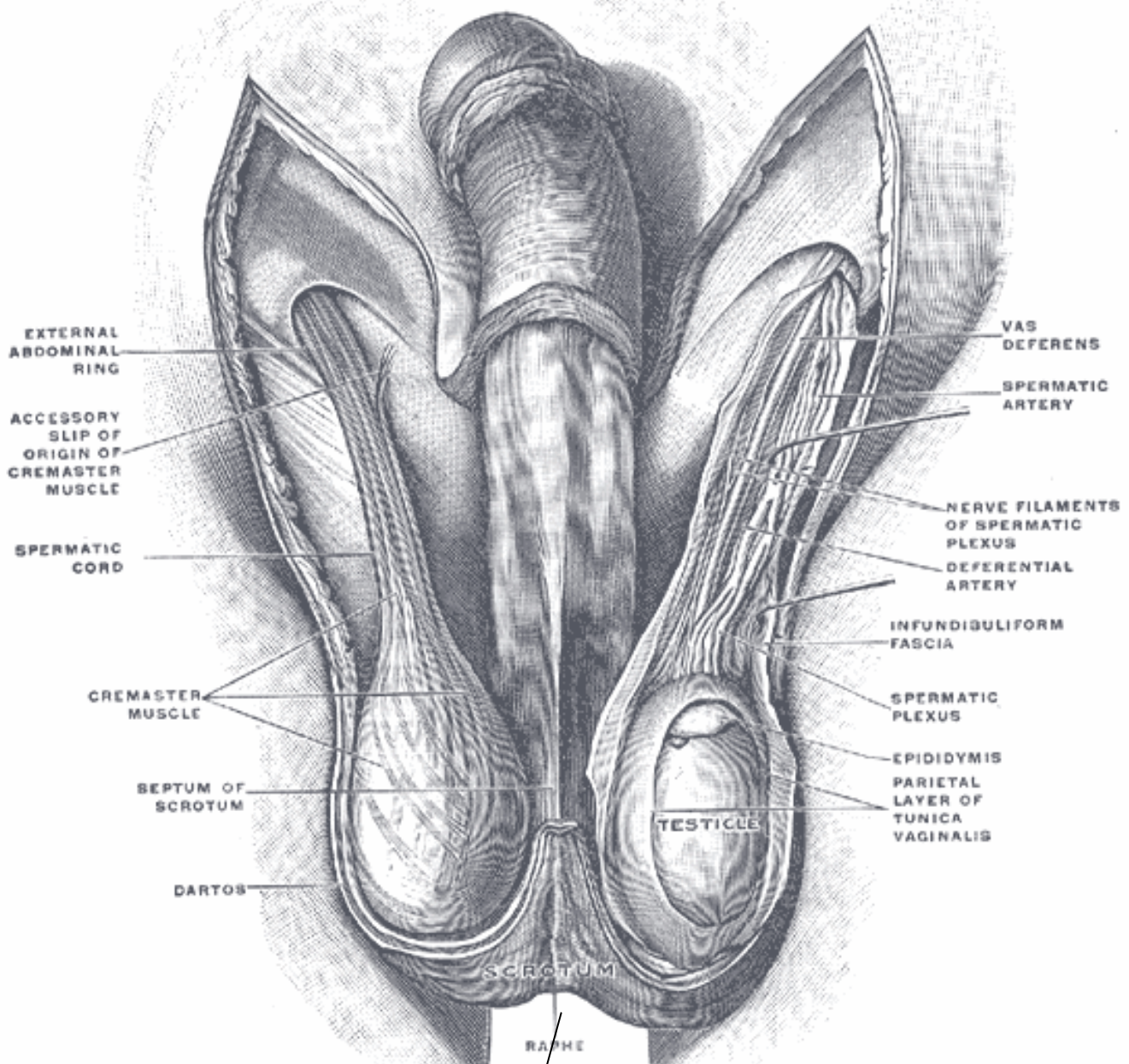
FUNCTION OF THE PROSTATE:

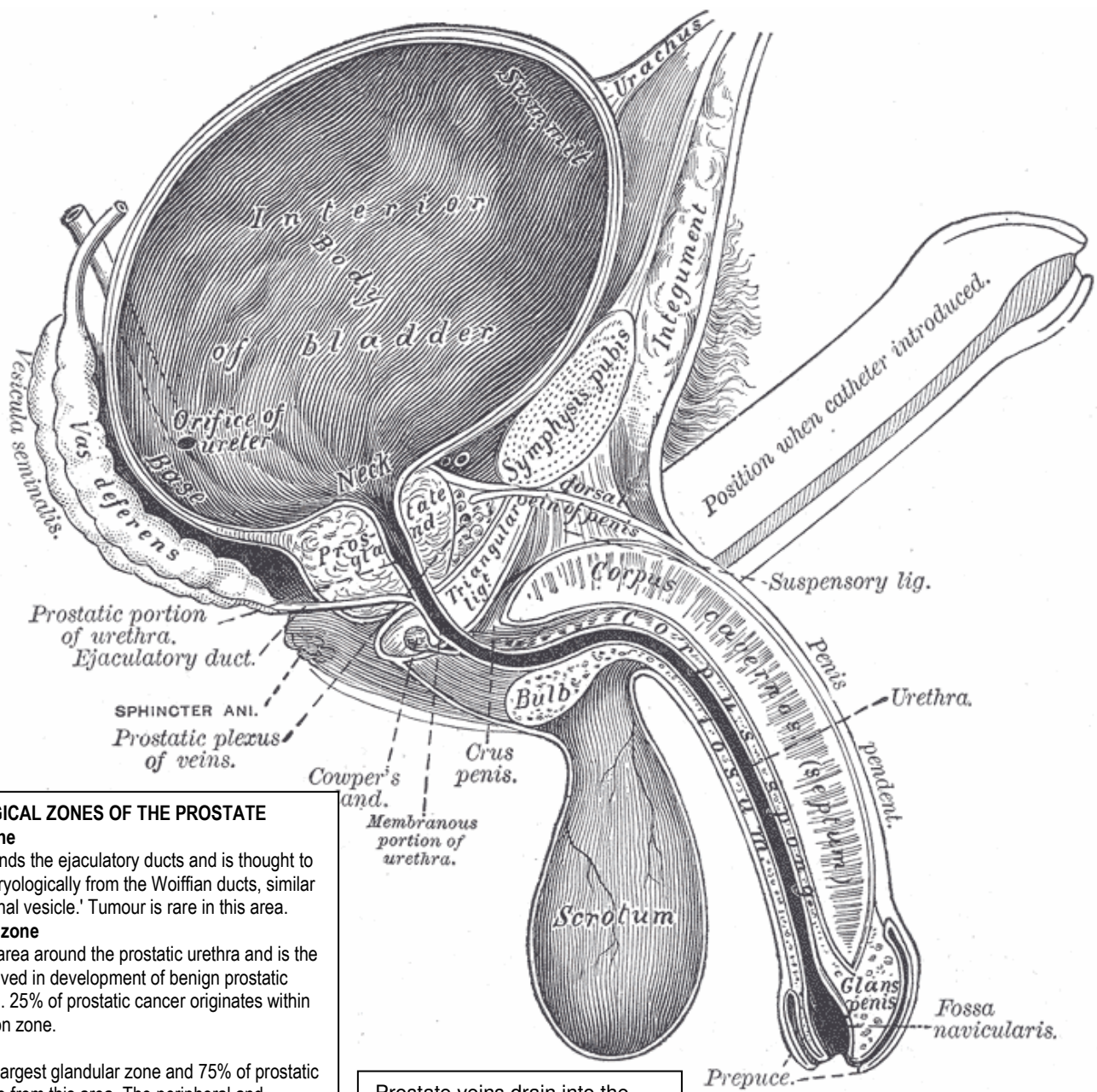
- **Controlled by testosterone:** prostate epithelium and stromal cells convert it into its active form.
- **STROMAL CELLS** are the prostate farmers, they produce growth factors and regulate secretion. They seem to be responsible for BPH when they over-stimulate themselves and their neighbouring cells.
- **THE PROSTATE SECRETES FLUID: 20% of ejaculated volume**
 Exactly what this achieves is uncertain. Theoretically some components of the secretion have a buffering and antimicrobial activity which helps protect your sperm from the surface-of-Venus-like environment of the vagina.
 - Zink, citric acid, polyamines (buffers?)
 - PSA (liquefactive proteinase)

The seminal vesicles secrete the rest of the ejaculated volume. Their secretions are rich in fructose and this is convenient for the fructose-eating sperm, who have no mitochondria.

Molecular Mechanisms of Prostatic Carcinogenesis







Prostate veins drain into the paravertebral system of veins; Hence the spinal metastasis

HISTOLOGICAL ZONES OF THE PROSTATE

Central zone
 This surrounds the ejaculatory ducts and is thought to derive embryologically from the Wolffian ducts, similar to the seminal vesicle. Tumour is rare in this area.

Transition zone
 This is the area around the prostatic urethra and is the region involved in development of benign prostatic hyperplasia. 25% of prostatic cancer originates within the transition zone.

Peripheral
 This is the largest glandular zone and 75% of prostatic cancer arise from this area. The peripheral and transition zones are thought to derive from the urogenital sinus mesenchyme.

