McKinnon BTC

Touch, Health, and Common Conditions

Urinary and Reproductive Systems and Massage

12/11/20 1

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Intro, Structures, Functions

Urinary System

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Introduction to the Urinary System

- The Urinary System itself is very small… but its effect on the health of the whole system is huge.
- The accumulation of waste is a major factor in reduced health and function.
- We take for granted that wastes are expelled from our bodies… but deciding what is waste and what is not is no small matter.

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Introduction to the Urinary System

- Cells metabolize nutrients and produce toxic compounds such as ammonia and urea.
- All waste materials must be excreted for homeostasis to be maintained and for optimum metabolic function.
- There are several systems for waste elimination: respiratory, integumentary, digestive, and urinary.

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The Urinary System…

Structures *retr/o*, L = behind; *peritone*, L = the membrane around the intestines

- **Kidneys (2)** Positioned retroperitoneally (!) on either side of the vertebral column between the 12th thoracic and 3rd lumbar vertebrae; about the size of a bar of soap (12 cm long); reddish brown in color; enclosed in a tough, fibrous capsule and embedded in fat; outside is *cortex* and inside is *medulla*
- **Ureters (2)** Muscular tubes (~10") extending from the kidneys to the base of the urinary bladder.
- **Bladder (1)** Storage sac w/muscular exterior.
- **Urethra (1)** Another muscular tube that conveys urine from the urinary bladder to the outside; women, ~1.5" long; men, averages ~ 8".

The last three structures are all lined with mucous to protect the structures themselves from any possible infectious or noxious substances.

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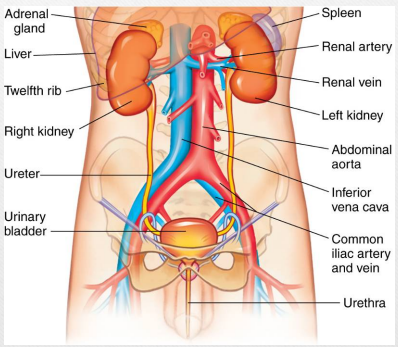
Urinary System Structures…



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The Urinary System… Kidney Functions

1. The kidneys function to **regulate the volume, composition, and pH of body fluids** and to **remove metabolic wastes from the blood** in the process: that is, they support homeostatic balance of fluid levels, electrolyte levels, and acid-base balance… while keeping house.
2. The kidneys also **help control the rate of red blood cell formation** by secreting *erythropoietin* and **regulate blood pressure** by secreting *renin*.

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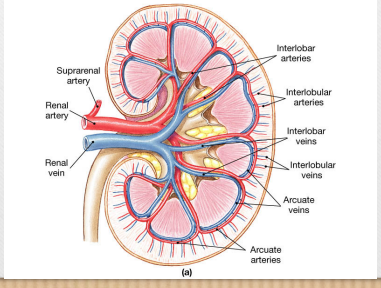
The Urinary System…

- ***Flow of Fluids***
  - Blood: Renal artery → capillaries → glomeruli → peritubular capillaries → renal vein
  - Filtrate/Urine: Nephrons → collecting tubules → renal pelvis → ureters → bladder → urethra



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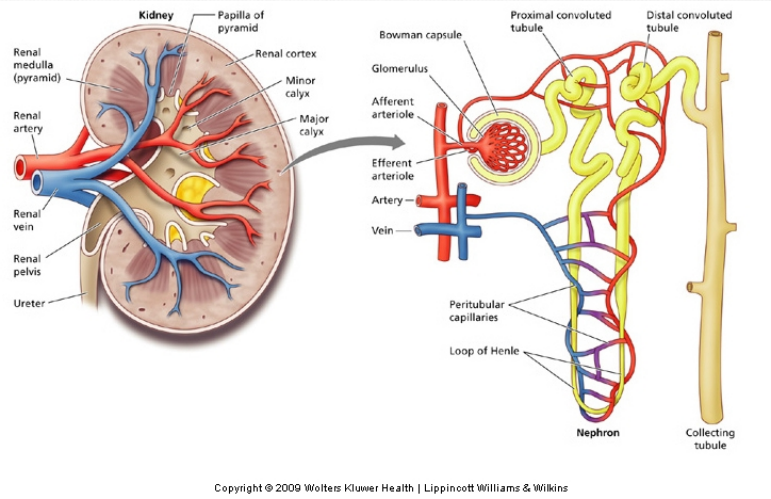
Flow of Fluids Within the Kidney and the Nephron

The *nephron* is the basic filtering unit of the kidney.



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The Urinary System…

- Glomerular filtration rate (GFR): 120 mL/minute or 180 L/day: that's **190 quarts or over 47 gallons of liquid that are processed through your kidneys each day.** Most of this liquid is conserved, and only a small amount is released as urine.

VS.

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The Urinary System…

- Epithelial tissue in kidneys is vulnerable to damage from chronic hypertension. The aorta branches directly into the renal artery, so the force in the artery is high.
- Blood pressure sensors are located close to the glomerulus.
- Kidneys are also vulnerable to damage from outside pressures and traumas. Heavy tapotement is prohibited in the area of the kidneys for this reason.

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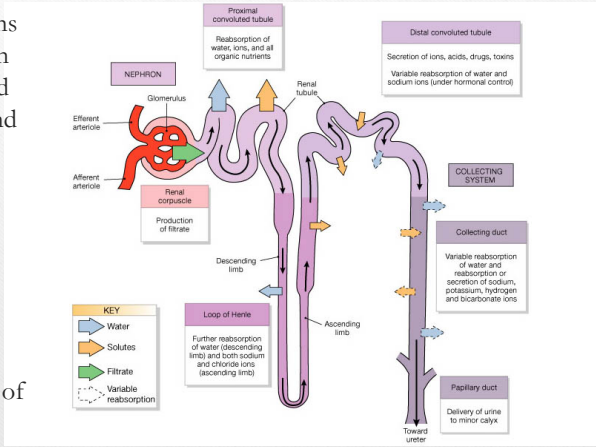
Urine Formation…

Urine formation begins when the fluid portion of the blood is filtered by the **glomerulus** and enters the glomerular capsule as glomerular filtrate.

Glomerular filtration rate is relatively constant, although sympathetic impulses may decrease the rate of filtration.



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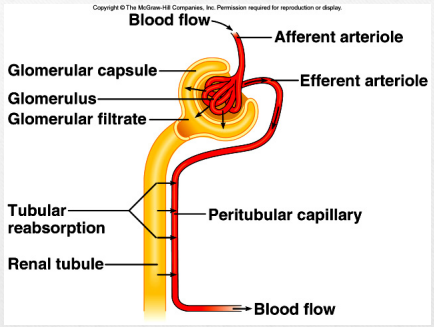
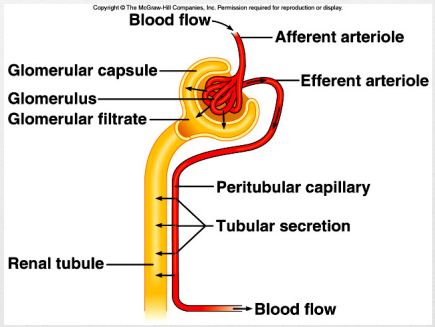
Urine Formation…

Changes in the fluid composition from the time glomerular filtrate is formed to when urine arrives at the collecting duct are largely the result of tubular reabsorption and secretion of selected substances.





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Kidney Dysfunction: A Positive Feedback Loop

(Werner, 6th, page 443 and 7th, page 486)

Blood pressure and kidney health are closely interrelated. If blood pressure is consistently too high, the delicate structures of the kidneys sustain damage and become less efficient. Less functional kidneys mean that the body accumulates excess fluid, which, in turn, raises blood pressure. The vicious cycle repeats itself and worsens over time.

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Urine Composition…

- Urine composition varies from time to time and reflects the amounts of water and solutes that the kidneys eliminate to maintain homeostasis.
- Urine is 95% water. The remainder is urea, uric acid, traces of amino acids, and electrolytes. [An electrolyte is any substance containing free ions that make the substance electrically conductive. Commonly, electrolytes are solutions of acids, bases or salts.]
- Urine, itself, is sterile. It is only contaminated with live biological agents as it passes over external (genital) surfaces (unless an infection is present).

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More Urine Facts…

- Urine tends to be slightly acidic.
- The average adult produces 1 to 2 quarts of urine per day.
- A *diuretic* is a substance promoting formation and excretion of urine. Some blood pressure medicines are diuretics.
- *Micturition* and *voiding* are synonyms for urination.

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Urination or Micturition…

- **Stretching of the urinary bladder triggers the micturition reflex center** located in the sacral portion of the spinal cord.
- **Return parasympathetic impulses** cause the **detrusor muscle to contract in waves**, and an **urge to urinate** is sensed. [*Detrusor (say, di-TRU-zer) muscle* = the muscular coat of the urinary bladder, which, along with gravity and increased intra-abdominal pressure, facilitates emptying of bladder during urination by its contraction.]
- When these contractions become strong enough, the **internal urethral sphincter is forced open**.
- **The external urethral sphincter** is composed of skeletal muscle and **is under conscious control**.

detrus, L = "thrust down"

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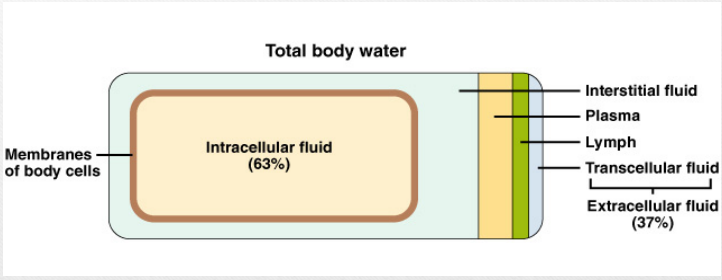
Just for kicks… Fluid Facts

- **Muscle tissue holds more water than adipose tissue.**
- **Most of the water in our bodies in *inside* our cells**…



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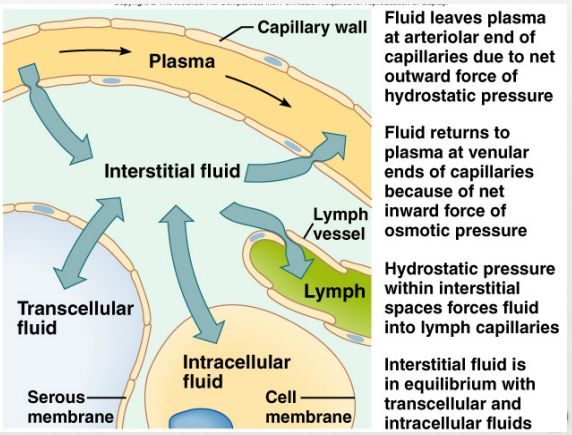
Just for kicks… Fluid Facts

Fluids are constantly moving and rebalancing throughout the body.

- About 60% of daily water is gained from drinking, another 30% comes from moist foods, and 10% from the water of metabolism.*
- Water is lost in urine, feces, perspiration, evaporation from skin (insensible perspiration), and from the lungs during breathing.

*The "water of metabolism" is water that forms in the body by oxidation of the hydrogen in foods, as in the metabolism of fat.



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Review…

A vicious positive feedback loop exists between kidney damage and _____.

Hypertension

Two synonyms for urination are _____ and _____.

Voiding and Micturition

In the nephron, the fluid portion of the blood leaves the capillary and becomes filtrate in/via the _____.

Bowman's Capsule/Glomerulus

The kidneys secrete _____to regulate red blood cell production.

Erythropoetin

The kidneys secrete _____to regulate blood pressure.

Renin

The tube that carries urine from the bladder to the outside is the _____.

Urethra

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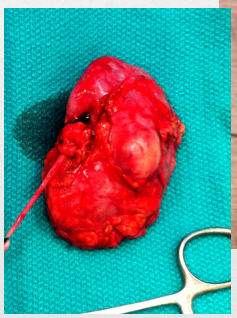
A Brief Look at (some)Kidney Conditions

- **Kidney Disorders**
  - Kidney stones
  - Polycystic kidney disease
  - Pyelonephritis
  - Renal cancer
  - Renal failure
- **Bladder and Urinary Tract Disorders**
  - Bladder cancer
  - Interstitial cystitis
  - Urinary tract infection

We'll look at items in green: please browse remainder in text.

Normal Kidney

Diseased Kidney: Half of Normal Size



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Kidney Stones

Definition– Crystals that develop in the renal pelvis, they can also be called renal calculi or nephrolithiases (or ureterolithiases if they are lodged in the ureter).

Demographics – Who gets them?

lith, G, = stone

- People who are dehydrated!
  - June–August, especially in southeast United States, are prime times
- Men > women
- Whites > other races
- 1 million stones passed/year! About 10% of all Americans pass kidney stones at some point.

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Kidney Stones, cont.

Why do they develop?

Primarily arise from dehydration, especially in combination with genetic anomalies, some medications, surgery, inflammation, urinary tract infection (UTI)

Different types of stones…

- *Calcium oxalate or calcium phosphate stones* **75%** Associated with parathyroid dysfunction, too much Vit D, and high salt diets
- *Struvite stones* **10–15%** Associated with chronic urinary tract infections
- *Uric acid stones* **5–8%** Associated with acidic blood from diet high in meat and flesh food purines; increases risk of gout
- *Other stones* **< 1%** Result from genetic mutations or use of medications (like protease inhibitors used to treat HIV/AIDS)

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Most kidney stones range in size from grains of sand to an inch or so in diameter. Occasionally, they become much larger and grow into the cortex of the kidney. This illustration is of one such "stone," called a *staghorn calculus*.

Average kidney stone…

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Kidney Stones, cont.

Signs and Symptoms

- Silent until they get stuck in ureters
- Intense grabbing pain
- Sudden onset
- Waves of pain
  - Can lead to nausea, vomiting in sympathetic reaction
- May refer pain to groin
- May be connected to infection: fever and chills

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Kidney Stones, cont.

Complications

- A stone big enough to interrupt kidney function may lead to acute or chronic renal failure

Methods for Diagnosis

- Radiology, ultrasound, magnetic resonance imaging (MRI), intravenous pyelography (dye is injected into kidneys and movement is traced)

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scopy, G, = observation

Kidney Stones, cont.

Treatment

- Percutaneous nephrolithotomy (surgery through tiny tunnel from the back) *per,* L = through or by means of
- Ureteroscopic stone removal (flexible tube up the urethra to dislodge stone)
- Extracorporeal shockwave lithotripsy (sound waves break up stone)

extra, L = outside, beyond; *corp,* L = body; *trips,* G = friction

Massage?

- Appropriate if no signs of current stone are present. History of stones does not constitute reason for modification.

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Renal Failure

Definition -- Kidneys are not functioning adequately, cannot keep up with demands

- Acute – sudden drop to less than 50% of normal function
- Chronic– impairment that may exist for months or years before it causes any symptoms

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Renal Failure, cont.

Demographics – Who gets it?

- Hypertension, diabetes are most common causes

2019 stats:

- 37 million people in US (15% of population) are estimated to have chronic kidney disease (CKD). 9 out of 10 (adults) do not know they have it.
- Incidence: African Americans, 16%; Hispanics, 14%; Non-Hispanic Whites, 13%; Asian Americans, 12%
- In 2016, 1 in 500 Americans was living with End-Stage Kidney Disease (ESKD). Treatments include dialysis and transplant.

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Renal Failure, cont.

How does it develop?

Chronic, severe, recurrent problems in urinary system may cause permanent damage. **Most people have over 2 million nephrons – which is about double what we need.** Even so, sometimes damage exceeds allowances… and renal failure ensues. Diabetes and chronic hypertension are leading causes.

Loss of EPO (red blood cell production hormone), poor electrolyte management, and poor fluid level management can lead to…

- Anemia
- Peripheral and pulmonary edema
- Pericarditis
- Problems with calcium, phosphorus, potassium
- Problems with bone density, digestion, inflammation, and heart rhythm

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Renal Failure, cont.

Signs and Symptoms

- Decreased urine output
- Systemic and pulmonary edema
- Arrhythmia
- Anemia
- Osteomalacia (softening of the bones)
- Rash and skin discoloration
- Lethargy
- Fatigue
- Headache
- Bruising and bleeding
- Muscle cramps
- Changes in mental and emotional state

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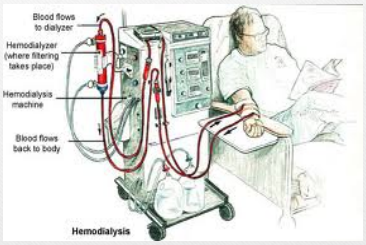
Renal Failure, cont.

Treatment

- Goals
  - Control the symptoms
  - Prevent further complications
  - Slow the progress of the disease
- Medication to control diabetes, hypertension, other conditions
- Dialysis if necessary
- Transplants
  - Currently, approx. 122,000 candidates for 17,000 kidneys
  - The median wait time for an individual's first kidney transplant is 3.6 years and can vary depending on health, compatibility and availability of organs.[2]



Hemodialysis

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Renal Failure, cont.

Massage?

- Renal failure contraindicates any rigorous massage, although energy work may be supportive.
- Clients undergoing dialysis have access points for the instruments that are vulnerable to infection: take extra care. Also, massage with lubrication can help with itching (hands often itch with dialysis).
- Massage for transplant recipients may be appropriate, if it fits within the limits of normal activities of daily living.
- Transplant recipients take immunosuppressant drugs for life, so we need to take extra precautions to keep them safe from communicable infections.

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General Considerations for Massage

- Kidneys, because of their placement in the body, are vulnerable organs. Heavy tapotement over the kidneys is always inadvisable.
- If a person has any form of kidney disease or dysfunction, it is important that we do not challenge these delicate organs any further. Always be mindful of a client's vitality level and ADLs.
- Massage can help to reduce clients' experience of anxiety or fear.
- Cancers should be treated according to cancer protocols.

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A Brief Look at Bladder Disorders

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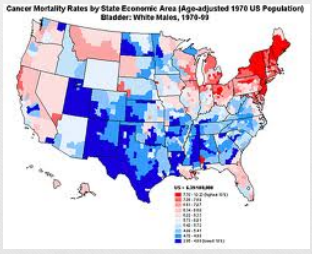
Bladder Cancer

Definition -- Development of malignant cells in the urinary bladder. Sixth most common cancer in the US.

Who gets it?

- Men develop at rate of 3 times that of women
- 75,000 diagnoses/year in the United States
- 15,000 deaths/year
- Median age at diagnosis is 68 years
- Whites and smokers most affected
- New England is thought to have elevated levels because of well water contaminants



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Bladder Cancer, cont.

How does it develop?

- Mutations in cells of transitional epithelium that lines the bladder
- In the United States, most cases are related to environmental toxins
  - Cigarette smoking is the biggest contributor
  - Other cases arise from exposure to aromatic amines from things like dry cleaning fluid, hairdressing chemicals, and substances used in textile and rubber industries

Signs and symptoms

- Primary sign: hematuria (blood in the urine) without pain
- Secondary signs: bladder irritability, compression on rectum, obstructed pelvic lymph nodes

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Bladder Cancer, cont.

Diagnosis

- Urinalysis, radiography, cystoscopy (visual inspection through tube up urethra), local biopsies
- Blood markers are being sought; some genetic markers exist

Treatment

- Removal of abnormal tissue, part or all of bladder, maybe other tissues
- Radiation therapy, chemotherapy
- Biological therapy (introducing bacteria into the area to stimulate immune response and fight cancer cells)

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Bladder Cancer, cont.

Prognosis

- Usually found in early stages
- Can grow in multiple sites at different rates; high risk of recurrence

Massage?

- Same cautions as for any type of cancer
  - Respect challenges of treatment
  - Work with health care team

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Urinary Tract Infection

Definition -- Infection anywhere in the lower urinary system

Who gets it?

- Usually women (short urethra): app. 50% of women will have at least one UTI
- In men, may indicate sexually transmitted disease (STD) or prostate problem
- People who use a catheter have increased risk
- UTIs account for 8 million visits to doctor/year

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Urinary Tract Infection, cont.

How does it develop?

- Microorganisms are introduced into the urethra
- They can cling to mucous lining
- May travel into ureters, to kidneys

- ***Causes***
  - 90% UTIs are from *Escherichia coli (E coli)*
  - Could also be from staphylococcus, Klebsiella, chlamydia, mycoplasma, or due to irritation (honeymoon cystitis)

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Urinary Tract Infection, cont.

Risk Factors

- Spermicides
- Diaphragm use
- Pregnancy (not likely to get more infections, but they are more dangerous)
- Diabetes (sugar in urine makes bladder more hospitable to bacteria)
- Neurogenic bladder (bladder that no longer empties completely)

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Urinary Tract Infection, cont.

Signs and Symptoms

- Painful, burning urination
- Increased frequency or urination
- Reduced capacity to hold urine
- Cloudy or blood-tinged urine
- Pelvic, abdominal, or low back pain
- If flank or back pain, consider kidney infection
- Men may have pain in penis or scrotum

The dreadful truth behind urinary tract infections

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Urinary Tract Infection, cont.

Treatment

- Hydration
- Hot and cold **sitz baths**
- Antibiotics

Sitz Bath: only the hips and buttocks are immersed, leaving the legs outside the tub

Prevention

- Hydrating fully
- Blueberry/cranberry juice (unsweetened)
- Urinating immediately after sex
- Wiping from front to back
- Showers, not baths
- Avoiding hygiene sprays and douches

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Urinary Tract Infection, cont.

Massage?

- During an infection, massage will probably not be welcomed
- If it is, noninvasive bodywork may be soothing
- No modifications are needed once recovery is complete

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Review…

What condition is more common in women; is associated with *E coli;* and causes painful urination?

UTI (Urinary Tract Infection)

Vulnerable, retroperitoneal organs

Kidneys

Each person has over 2 million of these basic functional kidney units…

Nephrons

Nephrolithiases are usually silent until they lodge in the…

Ureters

If a person has kidney disease, it is important to take_____ into account before performing massage.

General level of vitality and ADLs

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One more Body System to go today…!
You can do this.
☺

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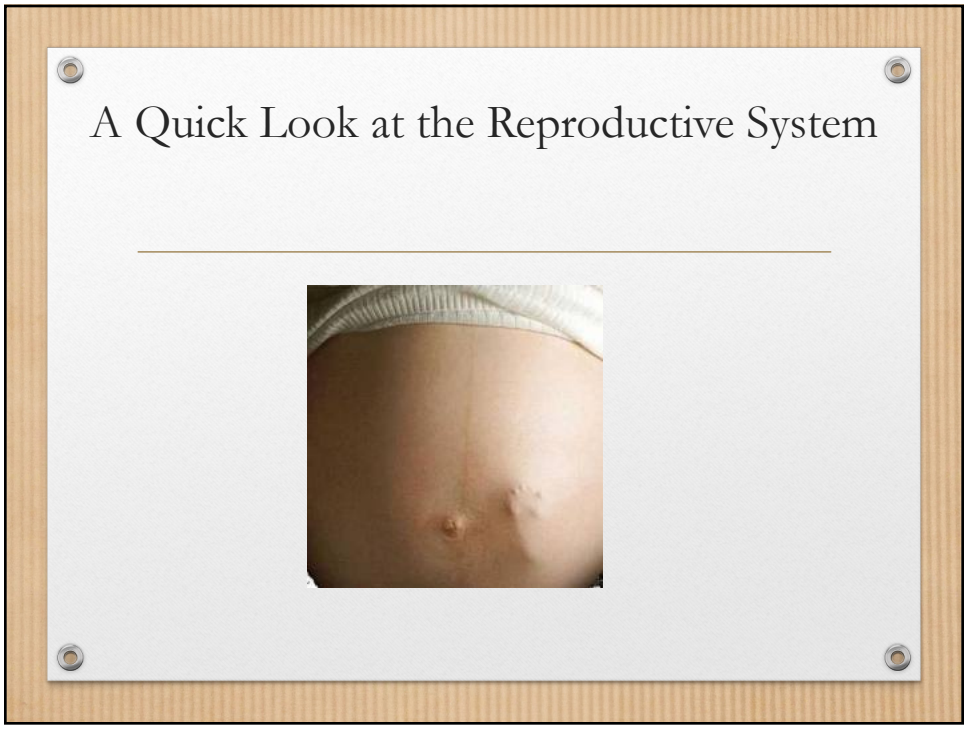
A Quick Look at the Reproductive System

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Introduction

Why do massage therapists need to learn about the reproductive system?

- Some reproductive system conditions or treatment options have repercussions for massage therapists
- Not all reproductive system *conditions* are *diseases*: pregnancy and menopause are perfectly normal and healthy—but they do change the way people function (or… following our understanding of homeostasis, they *are* sometimes classed as pathologies, though, as we are seeing, homeostasis is always relative, changing with age and various conditions…)

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Introduction, cont.

- The relationship between the reproductive and endocrine systems is extremely tight.
- Several conditions could be listed as endocrine system conditions
- A history of surgery, inflammation, scar tissue in the female pelvis may allow the ovaries to move out of their usual location: this creates a caution for deep abdominal massage.
- Many male reproductive system conditions involve the prostate gland
  - Prostate massage is conducted through the wall of the rectum for diagnostic purposes; **not considered within the scope of practice** for massage therapists
- Massage may not have a direct impact on conditions, but it can improve quality of life of the person who lives with them.

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Female System Notes

- Eggs pass from the ovaries through the fallopian tubes to the uterus. The uterus is lined with endometrium.
  - If no fertilized egg attaches, endometrium is shed with menses.
- Hormone secretions from the ovaries and the pituitary determine menstrual cycle, pregnancy.
  - Birth control pills and patches work by introducing hormones to mimic pregnancy, which suppresses ovulation.

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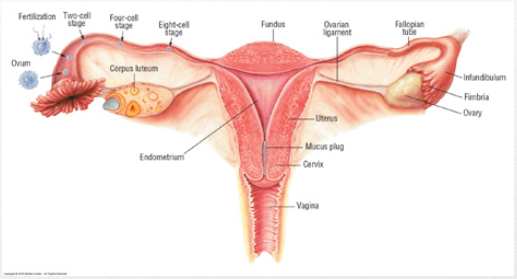
Female Internal Pelvic Reproductive Structures



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Male System Notes

- Structures include testes, epididymus, vas or ductus deferens, prostate, and penis
- Sperm is produced in the testes, stored in the epididymus, and transported through the right or left vas deferens.
- Sperm are smallest human cells and the only ones with flagella
- The vas deferens becomes the ejaculatory duct which joins to form the urethra; the urethra is used for expulsion of urine as well as semen

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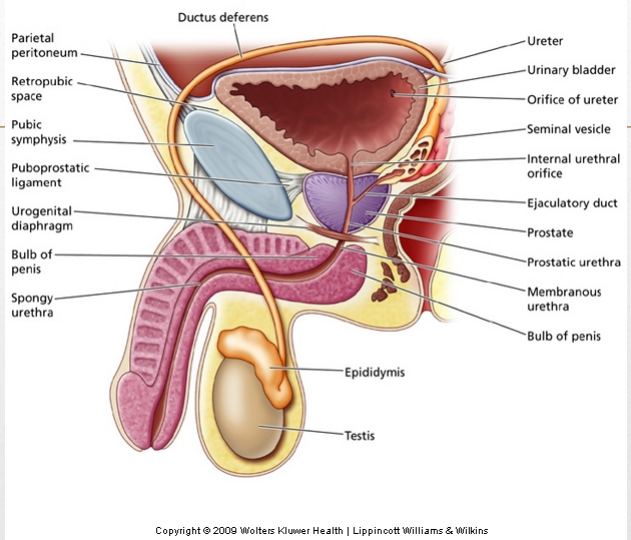
Male Reproductive Structures



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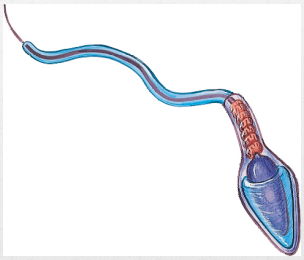
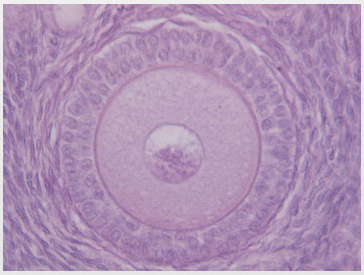
Sex Cells

- Oocytes—female sex cells
- Spermatozoa—male sex cells





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Sex and Gender

We look at health and disorders of the reproductive system as either pertaining to men or women. These designations are used to describe which structures are present.

In intersex individuals, reproductive structures from both sexes may be present. In transgender individuals, gender identity and reproductive organs may not follow traditional lines of division.

It is the job of massage therapists to bring unconditional positive regard to our clients and to create a welcoming and safe experience.

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A Few Important Terms… (Chapter 11, Werner 6th)

Gamete – A mature male or female germ cell (egg or sperm); has half the normal number of chromosomes (haploid)
Zygote – A fertilized egg; full number of chromosomes (diploid)
Meiosis – a type of cell division resulting in 4 daughter cells, each with half the usual number of chromosomes; the kind of division that creates a gamete
Mitosis – a type of cell division resulting in two daughter cells, each with the same number and kind of chromosomes as the parent cell; the kind of division in normal tissue growth

Endometrium	**Estrogen dominance**	**Hypertrophy**
Uterus	**Testes**	**Hyperplasia**
Ovary	**Epididymus**	**Fallopian tube**
Estrogens	**Vas deferens**	**Endogenous**
Progesterones	**Prostate**	**Exogenous**

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Inheritance

- Inheritance—expression of traits and conditions passed from one generation to another through sexual reproduction
- Deoxyribonucleic acid (DNA)—chemical found in each cell in the body that holds genetic coding. Also, the only common molecule capable of directing its own synthesis. For more on DNA: http://biology.clc.uc.edu/courses/bio104/dna.htm
- Gene—section of DNA on a chromosome that codes for specific traits
- DNA "codes" molecule synthesis in a process involving RNA

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Human Genetics and Pathologies

- Mutations and gene diseases—mistakes in the gene-coding system (sickle cell disease, muscular dystrophy)
- Chromosomal disorders—caused by having too many or not enough chromosomes or by having a broken or missing piece of a chromosome (birth defects)
- Some viruses (like herpes, HIV, and SARS-CoV-2) insert their DNA into our cells when they infect us. They affect the sequence of RNA… which then is reverse-transcribed to create DNA… which then is programmed to create more of the infecting virus!

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Reproductive System Conditions

- **Uterine Disorders and Events**
  - Abortion, spontaneous and elective
  - Cervical cancer
  - Dysmenorrhea
  - Endometriosis
  - Fibroid tumors
  - Uterine cancer
- **Disorders of other Female Reproductive Structures**
  - Breast cancer
  - Ovarian cancer
  - Ovarian cysts
- **Disorders of the Male Reproductive System**
  - Benign prostatic hyperplasia
  - Prostate cancer
  - Prostatitis
  - Testicular cancer
- **Other Reproductive System Conditions and Events**
  - Menopause
  - Pregnancy
  - Premenstrual syndrome
  - Sexually transmitted diseases
  - Transgender hormone therapy (see link) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5182277/>

We'll take a look at the conditions in green. Please refer to your text and browse the others.

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Endometriosis

What is it?

- Cells from the endometrium implant elsewhere in the body
- These cells, no matter where they are, behave like uterine endometrial cells – but they cannot be shed as they normally would be
- Over years, they create thick, black scars/growths and cysts
- Symptoms can include infertility, abdominal pain, leg pain, and painful urination

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Endometriosis

Treatments…. Massage

- Common treatments aim to reduce pain, halt progression, and maintain or restore fertility
- Anti-inflammatories and analgesics are prescribed for pain; Hormones may be given ; Surgical interventions are also an option
- Superficial work on the abdomen is not contraindicated; massage can help with anxiety and pain; with special training, more may be done to relieve pain

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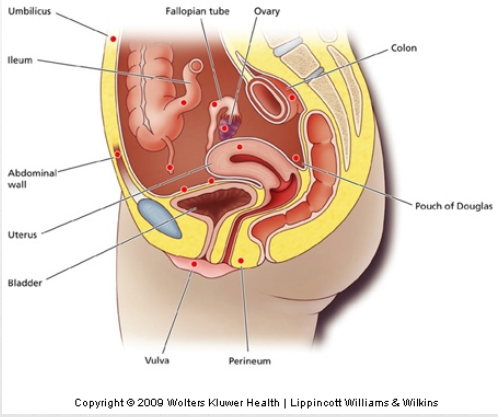
Endometrial Growth Sites



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Fibroid Tumors

What are they? Massage?

- Also called *leiomyomas,* these are benign tumors that grow in or around the uterus (in walls, on stalks)
- Extremely common: app 50% of all women have fibroids. They contribute to 200,000 hysterectomies in the US each year.
- The structure of a fibroid is similar to a keloid. Both keloids and fibroids occur 3x more often in African Americans than in other racial groups.
- Can cause anemia, pain, infertility – or be asymptomatic
- Other than caution around large fibroids, no modification is needed

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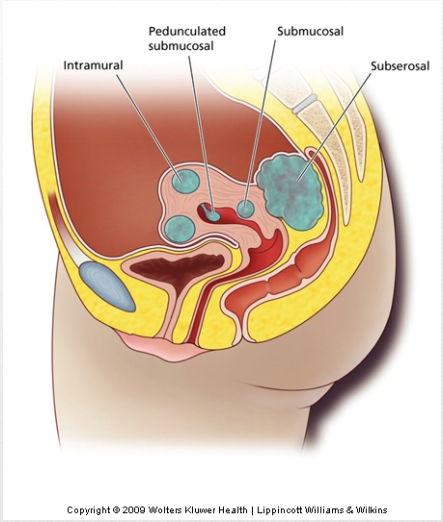
Fibroid Tumors



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Benign Prostatic Hyperplasia

What is it?

- The prostate grows new cells (non-malignant) and becomes enlarged
- Affects 50% of men over 60; 70% of men over 70; and 80% of men over 80: approx. 14 million US men
- Causes are not clear. Symptoms include pressure on the urethra and difficulty expelling urine, sometimes with leaking. Risks of bladder irritation, UTIs, pyelonephritis, and bladder stones increase. Pain should be absent and would indicate something else.
- Treated primarily with medication, if treatment is needed
- MTs should look out for infections; otherwise, no modifications are necessary.

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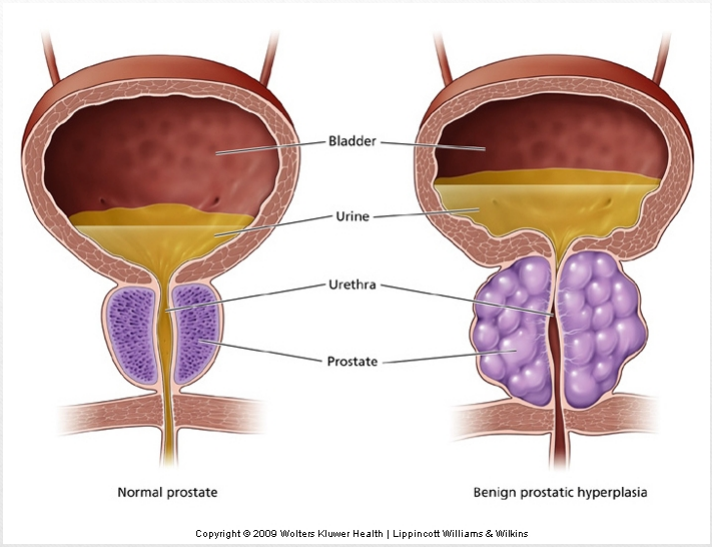
Comparison of Normal and Hyperplasiac Prostate



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Prostatitis

Definition

- Prostate is painful, possibly inflamed
- Pain throughout pelvis and groin (different from benign prostate hyperplasia, prostate cancer)

Who gets it?

- Accounts for over 2 million doctor visits/year
- 50% of men 20–74 years old will have symptoms at some time

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Prostatitis, cont.

What causes it?

- Draining channels of prostate are on horizontal plane
- If material doesn't drain, it can become stagnant
- Bladder reflux can cause damage

Symptoms?

- Most common type is actually prostate enlargement without apparent infection (Chronic Pelvic Pain Syndrome or CPPS): no fever or inflammation, but frequent or difficult urination
- When infection (acute or chronic) is present, symptoms mirror those of urinary tract infections (fever, pain on urination, pain in pelvis, etc.)

Massage?

- No direct impact; avoid acute infection
- Can be useful to reduce anxiety, effects of discomfort

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Pregnancy

Definition

- Carrying a fetus

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Pregnancy, cont.

Common Signs and Symptoms

- *Loose ligaments*
  - Starts early in pregnancy, can lead to unstable joints and muscle spasm
- *Fatigue*
  - Combination of carrying extra weight and hormones that demand rest
- *Shifting proprioception*
  - Rapid changes in size, shape, weight: clumsiness, vulnerability to injury
- *Anxiety and depression*
  - Can alter quality of life and ability to bond with child

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Pregnancy, cont.

Complications

Of many, four have special implications for massage.

- *Thromboembolism*
  - Deep vein thrombosis (DVT) and pulmonary embolism
  - Four times the usual risk for blood clots, highest a few days after birth
- *Gestational diabetes*
  - 9.2% of all pregnancies
  - Risks to mother: macrosomia (large baby), type 2 diabetes. Risks to baby: respiratory distress syndrome, hypoglycemia, later obesity, type 2 diabetes

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Pregnancy, cont.

- *Pregnancy-induced hypertension (PIH)*
  - Can start slowly, quickly become threatening
  - 6% to 8% of pregnancies
  - Three categories
    - Hypertension
    - Preeclampsia (hypertension and proteinuria with systemic edema)
    - Eclampsia: preeclampsia and convulsions or coma
- Usually happens with first pregnancy or in teens or women >40
- Treated with hypertension medication, bed rest, cesarean delivery

eklampsis, G = sudden development or flashing

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Pregnancy, cont.

- *Ectopic pregnancy*
  - A fertilized egg implants outside the uterus
  - Usually occurs in uterine (fallopian) tubes
  - Can be in the peritoneum, on ovaries, on cervix
  - 1–2% of pregnancies

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Pregnancy, cont.

Massage?

- For uncomplicated pregnancies, indicated with caution by trimester
- Special training available for this population; complications require special care

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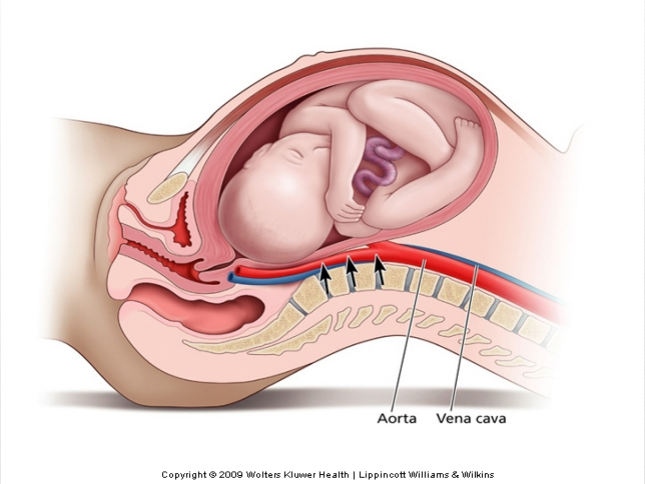
Advanced pregnancy places significant pressure on major blood vessels…



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Cautions for Uncomplicated Pregnancies, By Trimester

- ***1st trimester***
  - Avoid deep abdominal work
  - Eastern approaches also recommend avoiding heels, Achilles tendons, hoku point of thumb
- ***2nd trimester***
  - Bolsters, other support may become necessary
  - Client may not want to lie prone
- ***3rd trimester***
  - No prone without cushions, no supine (side work may be appropriate)
  - Limited blood return from legs, bc of risk of varicose veins, clotting, DVT
  - Watch for fever, dizziness, headache, nausea: these require physician referral

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Review…

Match the following…

Term	Answers	Word Bank
Prostatitis	Pain in Pelvis	Benign uterine tumors
Fallopian or uterine tube	From ovary to uterus	Lining of uterus
Sperm	Smallest human cells	Fertilized egg
Endometrium	Lining of uterus	Cell division (growth)
Mitosis	Cell division (growth)	Storage of sperm
Hyperplasia	New cell growth	From ovary to uterus
Epididymus	Storage of sperm	New cell growth
Zygote	Fertilized egg	Smallest human cells
Fibroids	Benign uterine tumors	Pain in pelvis

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