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Introduction Disorders of the Endocrine System	Introduction Kidney Disorders Bladder and Urinary Tract Disorders
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Endocrine System

Collection of glands that secrete hormones: chemical messages that instruct or stimulate other glands and tissues in the body to function in a variety of ways.

Hypothalamus is control center for endocrine (chemical) reactions and autonomic (electrical) reactions

- Hypothalamus connects to pituitary (master gland) via motor neurons and hormones
- Hormones from hypothalamus and pituitary travel through bloodstream to target organs and tissues
- Many targets are other endocrine glands
- When hypothalamus (or other glands) sense that secretions are normal, the signals stop: negative feedback loop

Most hormone cycles work best in gentle, rhythmic fluctuations

- Cycle can last hours, days, weeks

Three classes of hormones

- *Peptides*: growth hormone, erythropoietin, parathyroid hormone
- *Amines*: from tyrosine, stored in cellular deposits; adrenaline, thyroxine
- *Steroids*: cortisol, testosterone

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Key Hormones

Growth hormone	Adrenaline	Cortisol	Mineralcorticoids	Insulin /glucagon
Converts fuel into new cells for growth (in children) and repair (in adults) Secreted mostly in stage IV sleep	Also called epinephrine From adrenal medulla, associated with short-term, high-grade stress; reinforces and prolongs sympathetic response	A steroid glucocorticoid from adrenal cortex Secreted during long-term, low-grade stress, measurable in saliva Powerful anti-inflammatory, dissolves connective tissue, suppresses immune system	From adrenal cortex for regulation of water, electrolytes; aldosterone is primary mineralocorticoid	Antagonistic hormones from pancreas: insulin decreases blood glucose (BG), glucagon raises it

Thyroxine	Calcitonin	Parathyroid hormone	Testosterone, estrogens, progesterone	Other hormones
From thyroid, in two forms: T_3 and T_4 Stimulates metabolism of fuel into energy (rather than storage or growth)	Also from thyroid, stimulates osteoblasts, increases bone density and decreases blood calcium	From parathyroid glands, antagonist of calcitonin: stimulates osteoclasts, decreases bone density, increases blood calcium	From gonads and other cells for secondary sexual characteristics Environmental exposures (estrogen dominance) can upset balance	Erythropoietin (EPO) from kidneys increases red blood cell (RBC) production Thymosin from thymus helps mature T cells Melatonin from pineal gland helps determine sleep/wake cycle Prostaglandins are all over: promote inflammation, pain sensation,

				smooth muscle contraction

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Disorders of the Endocrine System

Acromegaly

Addison disease

Cushing syndrome

Diabetes mellitus

Hyperthyroidism

Hypothyroidism

Metabolic syndrome

Thyroid Cancer

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Acromegaly

Acro = extremities; megaly = large ; Usually a benign tumor on the pituitary gland: too much growth hormone (GH) ; Hands, feet grow in adulthood (In childhood this is called gigantism)

Demographics

Mostly young adults

Men = women

11,000 have it

800 diagnoses/year in the United States

Etiology

GH from pituitary → somatomedin C (insulinlike growth factor [IGF] I)

Too much GH → too much IGF-I

Bone enlargement, joint distortion and pain, enlarged weak heart

Tumor can press on central nervous system (CNS)

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more Acromegaly

Signs and Symptoms	Diagnosis	Treatment	Massage
Early: headache, vision problems from pressure Enlarged hands, feet, facial bones (mandibles and spaces between teeth) Joint pain, fatigue, hyperhidrosis, sleep apnea **Complications** Cardiovascular (CV) stress: high blood pressure, cardiomegaly, heart failure Some have insulin resistance, diabetes, colorectal cancer, uterine fibroids	Abnormal growth and elevated IGF-I Computed tomography (CT), magnetic resonance imaging (MRI) to find tumor Delay in diagnosis can allow tumor to grow; removal becomes difficult	Surgery works best when tumor is < 1 cm Balance IGF-I with medication Usually manageable condition	High blood pressure, cardiomegaly, heart failure contraindicate circulatory massage Other techniques may help with joint pain; work as part of health care team

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Addison's Disease

Adrenal cortex insufficiency: low cortisol, aldosterone, androgenic hormones

Demographics

Affects about 13,000 people in the United States

Men = women

Mostly 30–50 years old

Etiology

Adrenal cortex produces glucocorticoids, mineralocorticoids, androgens

Primary Addison disease: not enough key hormones are manufactured

70% cases = autoimmune attack on adrenal medulla

- Adrenal glands alone = idiopathic adrenal insufficiency
- Adrenals with other glands = *polyendocrine deficiency syndrome*

Tuberculosis infections of the adrenal glands can cause it (rare in U.S., common in developing countries)

Secondary Addison disease: low pituitary secretions of adrenocorticotropic hormone (ACTH)

- Suddenly stopping steroid medication
- Pituitary tumor or surgery

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more Addison's Disease

Signs and Symptoms	Diagnosis	Treatment	Massage
Cortisol depletion, low aldosterone and androgens Muscle weakness, fatigue, low blood pressure, hypoglycemia, irritability, depression, loss of pubic hair in women, hyperpigmentation **Complications** Addisonian crisis: sudden onset of extreme symptoms: Sharp abdominal pain, nausea, vomiting, diarrhea Low back pain, pain in extremities, low blood pressure, loss of consciousness	Tests to measure cortisol, reactivity to hormones, CT, MRI of adrenals, pituitary Test for adrenal cortex antibodies (indicates autoimmune potential)	Treatable with steroids; establishing dosage can be challenging	Guided by client's health, resilience Be careful about blood pressure (hypotension can be worse with massage)

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Cushing Syndrome

Hypercortisolism leading to tissue changes and possible death

Demographics

3,000–4,500 people have it in the United States

Prevalence of types varies by gender

Etiology

Can be exogenous or endogenous

Exogenous

Autoimmune disease, cortisol-based steroid medication (most common form)

Endogenous

Too much ACTH from pituitary or too much cortisol from adrenals

Pituitary adenoma

- Benign tumor grows on pituitary
- Also called Cushing disease; women > men 5:1

Ectopic ACTH syndrome

- ACTH is secreted by tissues outside pituitary: cancer cells in pancreas, thymus, thyroid
- Men > women 3:1

Adrenal tumors

- Rare: tumors on adrenal glands secrete cortisol
- Can be benign or malignant

more Cushing Syndrome

Signs and Symptoms	Diagnosis	Treatment	Massage
Fatty deposits around neck and face, abdomen, upper back Arms, legs become thin and weak Collagen degenerates: Bone thinning, purple stretch marks High blood pressure, blood glucose (BG) (with risk of diabetes), mood changes, acne, slowed healing, hirsutism, disrupted menstrual cycle, erectile dysfunction	Test cortisol through blood, urine, saliva Hormone challenge tests, CT, MRI of adrenals, pituitary	Depends on cause: adjust medication, remove pituitary tumors, deal with cancer if necessary	Risks: high blood pressure, delicate skin, bones, compromised immunity Many modalities can be adjusted to account for these risks

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Diabetes Mellitus

Group of related disorders that all result in hyperglycemia ; 98% are type 1 or type 2

Etiology

Insulin is in short supply or

Insulin resistance

Either way: glucose accumulates in blood while cells have to burn fat, protein for fuel

Type 1

Used to be called IDDM or juvenile onset (now neither is exclusive to type 1)

Exposure to drugs or chemicals, complication of infections

Autoimmune attack on beta cells → lifelong deficiency in insulin

Symptoms usually show before age 30

LADA may show later

500,000–1 million in the United States have it: 5–10% of cases

High risk for big fluctuations in BG, diabetic emergencies

Type 2

Used to be called NIDDM, adult onset (now neither is consistently true)

Women > men

90% are obese at diagnosis

Usually controllable with diet, exercise, some medication but many patients end up supplementing insulin

Can be wear and tear on pancreas → reduce insulin production

Can be insulin resistance

Demographics

Number 6 cause of death in the United States: 224,000 deaths/year (probably underreported)

18 million to 21 million probably have it; 5 million to 6 million don't know yet

1.5 million diagnoses/year:

Aging population + more obese young people + sedentary lifestyle

$132 billion in direct and indirect costs: 11% of health care costs

Most common among Native Americans, Aleuts, African Americans, Pacific Islanders, Hispanics

Type 2 used to be adults only; now it is frequently diagnosed in people < 25

Diabetic Emergencies

Ketoacidosis _____

Type 1 diabetes only

Shortage of insulin and glucose in cells

Metabolism of fat and protein → ketones, acidosis

Triggered by stress, infection, trauma

Can lead to shock, coma, death

Hyperosmolality _____

Similar to ketoacidosis with type 1; seen in type 2

Insulin shock _____

Too much insulin, BG is dangerously low

Other Types

Gestational diabetes (discussed with pregnancy)

Complication of trauma, other endocrine disorder or treatment

Dizziness, confusion, weakness, tremors

Treated with milk, juice, candy, sugared (not diet) soda to replace BG

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more Diabetes Mellitus

Signs and Symptoms	Diagnosis	Treatment	Massage
Three *poly*'s Polyuria Polydipsia Polyphagia Also: fatigue, weight loss, nausea, vomiting Early signs are often missed; complications develop **Complications** *Cardiovascular disease* Endothelium becomes vulnerable to damage, atherosclerosis Plaque accumulates everywhere Increased risk of stroke, hypertension, aneurysm Most die of cardiovascular problem *Edema* Sluggish blood return, stasis dermatitis *Ulcers, gangrene, amputations* Poor circulation → risk of skin, tissue damage especially at feet 82,000 amputations/year *Kidney disease* Renal arteries have	Fasting blood sugar Normal is 110 mg/dL of blood 125+ mg/dL means diabetes	Insulin developed in 1921: diabetes become manageable Four goals: improve insulin production if possible; inhibit release of glucose from liver; increase sensitivity to insulin; decrease absorption of carbs in small intestine Also: maintain eyes, feet, skin carefully Type 1: insulin supplementation (through pump, not huge injections) Type 2: diet and exercise, then medication and insulin Renal insufficiency happens for many; hemodialysis can help while hoping for transplant	Can be appropriate: weigh risks and benefits Cardiovascular and kidney problems contraindicate rigorous circulatory massage Work when insulin is *not* at peak (to avoid double whammy) Be cautious about numbness, reduced sensation, skin lesions

plaque, glucose is hard on nephrons Number 1 cause of end-stage renal failure *Impaired vision* Thickened capillaries in eye; microaneurysms, glucose in lens Number 1 cause of new blindness in people 20–70 *Neuropathy* Lack of circulation and excess sugar contribute to peripheral nerve damage Tingling, pain, numbness At cranial nerves → poor gastrointestinal (GI) motility, low blood pressure *Others* Every system is affected Urinary tract infections, candidiasis, birth defects, aggressive infections, gingivitis, tooth loss			

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Hyperthyroidism

Thyroid produces excessive hormones that stimulate the metabolism of fuel into energy ; Most are autoimmune (Graves disease, diffuse toxic thyroid)

Etiology

Usually one of three possibilities

- Autoimmune attack on thyroid
- Nodule or group of nodules that become hyperactive
- Inflammation of thyroid

Graves disease is most common: 70–80%

- Thyroid-stimulating immunoglobulins attack; thyroid grows (goiter)
- Excessive thyroxine produced
- Conversion of fuel to energy increases 60–100%
- Triggered by stressful event

Toxic multinodular goiter: idiopathic

Toxic adenoma: iodine deficiency

Thyroid inflammation: infection or childbirth

Demographics

1–2% of adults in the United States

350,000 diagnosed/year

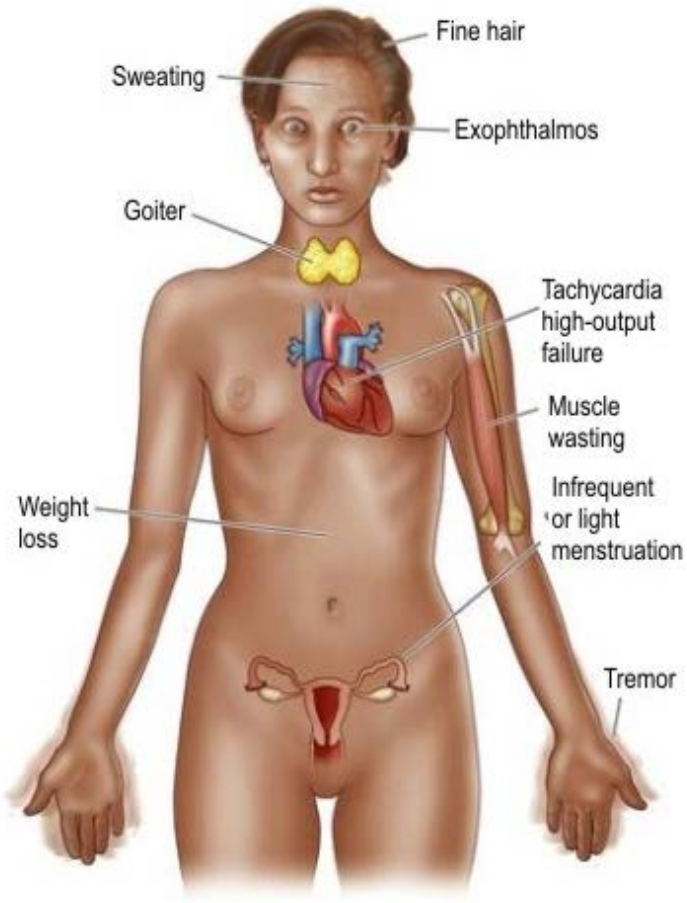
Women > men 8:1

Mostly 20–40 years

Genetic predisposition: if a person has Graves disease, first-degree relative probably has thyroid dysfunction

Can appear with other autoimmune diseases

- Autoimmune polyglandular syndrome
- Graves, type 1 diabetes, lupus, others



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more Hyperthyroidism

Signs and Symptoms	Diagnosis	Treatment	Massage
Related to too much thyroxine Anxiety, irritability, insomnia, rapid heartbeat, tremor, increased perspiration, sensitivity to heat, frequent bowel movements, and unintentional weight loss Skeletal muscles become weak, lighter menstrual flow, dry skin, brittle nails, problems with skin and eyes, goiter **Complications** Graves disease also effects bones, eyes, skin Bones: osteoporosis from calcitonin/parathyroid hormone imbalance Eyes: exophthalmus, Graves ophthalmopathy (tissues behind the eye swell) Skin: red patches on shins, feet: pretibial myxedema; thyroid acropachy Thyroid storms: sudden onset of sympathetic reaction, rapid heartbeat, fever, confusion, agitation, shock: medical	Physical examination, blood test, iodine test	*Radioactive iodine:* can kill off part of thyroid *Beta blockers:* reduce heart rate, feeling of palpitations *Antithyroid medications:* can prevent thyroid from producing too much thyroid hormone *Surgery:* thyroidectomy; has risks of complications	If skin is healthy, massage can be beneficial Can help ameliorate sympathetic symptoms

Hypothyroidism

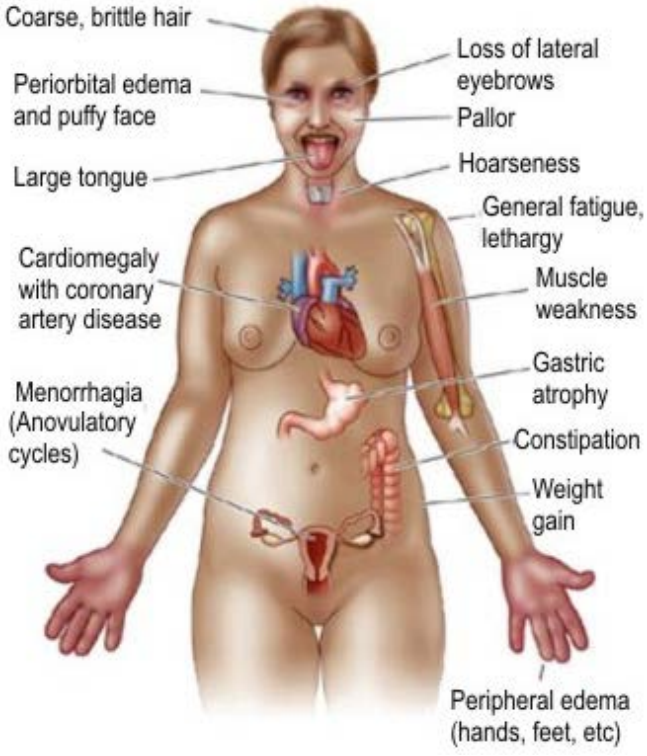
Thyroid hormones are abnormally low; body can't generate energy from fuel

Demographics

Most common pathological hormone deficiency

Numbers difficult to track: numbers don't always match symptoms

Women > men 2–8:1



Etiology

Pituitary (under control of hypothalamus) secretes thyroid-stimulating hormone (TSH)

Thyroid secretes

- T_3 = triiodothyronine
- T_4 = thyroxine

When T_3, T_4 levels are high, TSH is suppressed: negative feedback loop

T_3, T_4 stimulate conversion of fuel into energy

T_4 is converted to T_3

In early hypothyroidism

- TSH is high
- T_4 is low
- T_3 is normal

Contributing factors:

- *Hashimoto thyroiditis*
- *Complication of treatment for hyperthyroidism*
- *Congenital birth defect*
- *Postpartum*
- *Medications*
- *Exposure to radiation*
- *Iodine deficiency*
- *Idiopathic*

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more Hypothyroidism

Signs and Symptoms	Diagnosis	Treatment	Massage
Weight gain, fatigue, depression, sluggish digestion, intolerance to cold, puffy skin Edema may → carpal tunnel syndrome, nerve entrapments Hair may become brittle, fall out (especially at lateral eyebrows) Heavy menstrual periods Goiter High risk of heart disease Severe, untreated cases can → *myxedema coma*	Blood test: high TSH Goiter, slow heart rate, slowed reflexes Pregnancy can hide some symptoms: complications for baby Can look like depression, fibromyalgia, chronic fatigue syndrome, etc.: diagnosis can be controversial	Supplement thyroid hormone Synthetic T_4 (most can metabolize to T_3) T_3 can be supplemented with desiccated pig glands or a synthetic form	Respect risk of atherosclerosis Otherwise massage is safe and appropriate, may help alleviate fatigue and lethargy

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Metabolic Syndrome

Also called syndrome X, dysmetabolic syndrome, insulin resistance syndrome, prediabetes, the deadly quartet ; A collection of physical signs and symptoms that increase the risk of heart disease and type 2 diabetes

Demographics

An estimated 47 million people in the United States

Women > men

Latinos > other groups

Etiology

Five main features (see diagnosis)

Other possibilities: risk of blood clotting, high C-reactive protein, polycystic ovary disease

Any one of these is not alarming; in combination → risk of cardiovascular disease (increased 2x) and/or type 2 diabetes (increased 5x)

Major risk factors: obesity, insulin resistance (this can form a vicious circle)

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more Metabolic Syndrome

Signs and Symptoms	Diagnosis	Treatment	Massage
Central obesity (apple versus pear shape) Other signs listed later	Three of five risk factors High fasting blood glucose (>100 mg/dL after 9 hours of fasting) Abdominal obesity (waist > 35 inches for women, > 40 inches for men); somewhat flexible Elevated triglyceride levels (over 150 mg/dL) Low high-density lipoproteins (<40 mg/dL for men; <50 mg/dL for women) Hypertension (systolic >130; diastolic >85)	Short-term and long-term goals: Short term: low BG, correct cholesterol with medication Long term: increase physical activity, lose weight Reducing weight by 5–7% reduces risk of complications Limit alcohol use, quit smoking if necessary	Depends on general health, resilience of client Match to activities of daily living

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Thyroid Cancer

Any type of cancer that begins in thyroid gland ***;*** Three types: *Follicular cell , C cell , Lymphocytic*

Demographics

31,000 diagnoses/year (rising)

Women > men 2–3:1

1500 deaths/year in the United States

High treatment success: 350,000 survivors alive today

Etiology

DNA in thyroid cells is damaged; cell growth is uncontrolled, disorganized

Often be related to radiation exposure

Can have genetic predisposition

Types of Thyroid Cancer

Papillary thyroid cancer

70–80% of diagnoses

Usually stays local to thyroid and nearby nodes

Mostly diagnosed in women 30–50 years old

Follicular thyroid cancer

10% of diagnoses

More likely to metastasize, especially in people >50 years old *; Hürthle cell carcinoma*: A subtype of follicular thyroid cancer; poor prognosis

Medullary thyroid cancer

3–5% of diagnoses

Arises from C cells; rare, aggressive

Two subtypes

Multiple endocrine neoplasia type II (MEN-IIA)

MEN-IIB

Both of these involve tumors on other glands too

Familial thyroid cancer

Inherited, affects only thyroid
Slow-growing, mostly in people 40–60 years old

Anaplastic thyroid cancer

7% diagnoses
Also called undifferentiated thyroid cancer
Highly aggressive, metastasizes

Thyroid lymphoma

4% of diagnoses
Lymphocytes have DNA damage
Happens mostly with Hashimoto thyroiditis

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more Thyroid Cancer

Signs and Symptoms	Diagnosis	Treatment	Massage
Nonaggressive forms may be silent Later: painless enlargement in the throat, pressure on esophagus or trachea; tumors in lungs, bones	Hard to diagnose accurately: lots of thyroids grow tumors, only 5% are malignant Radioactive iodine can find extra activity Genetic testing	Most are treated successfully with surgery to remove thyroid gland Then supplement thyroid hormone Lymph nodes in neck examined for signs of metastasis Radiation therapy decreases risk of recurrence	Depends on treatment options, general resilience of patient Get clearance for radioactivity risks

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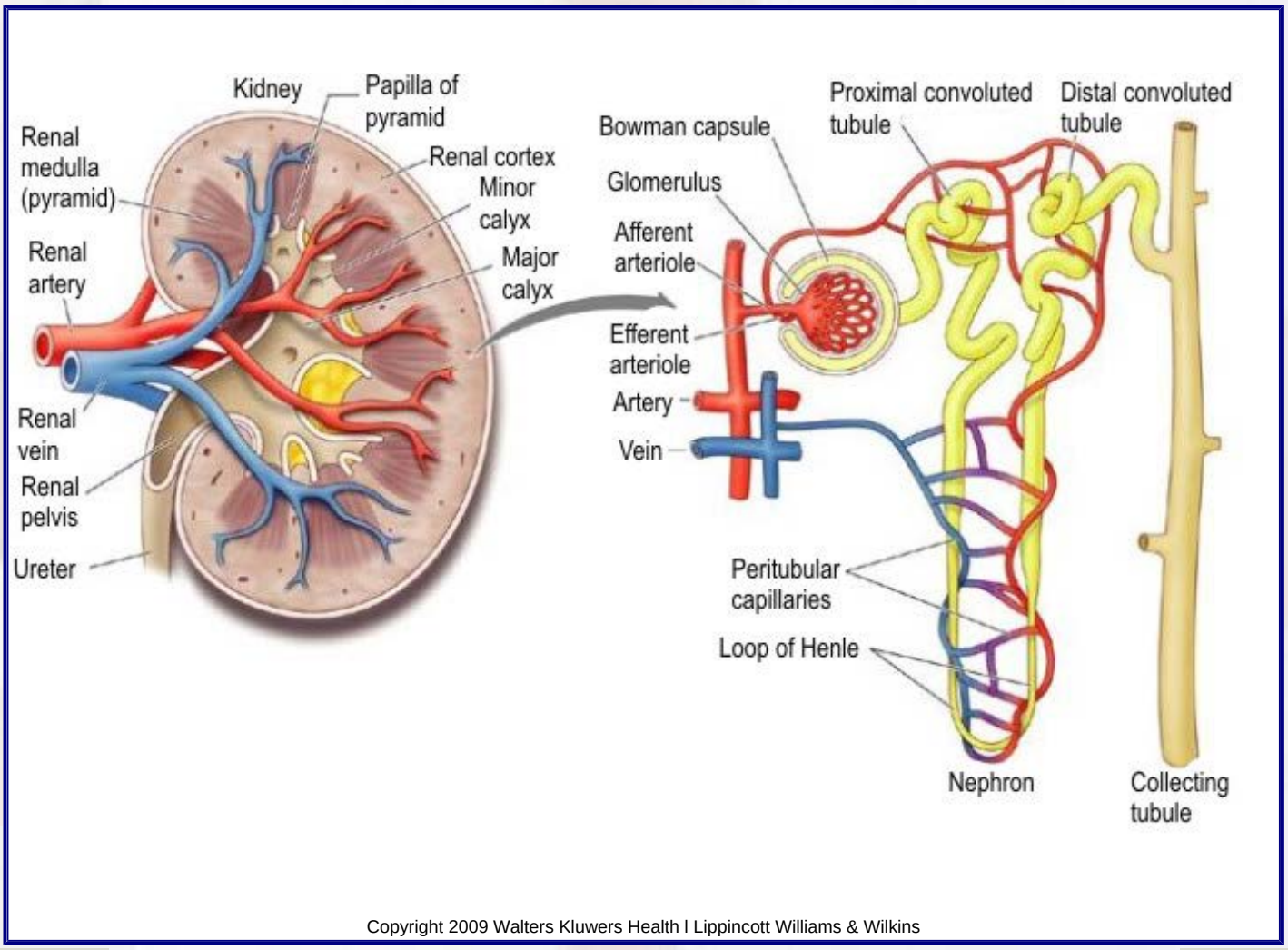
Urinary System



Function and Structure

Kidneys (2)
Ureters (2)
Bladder (1)
Urethra (1)

Renal artery → capillaries → glomeruli → peritubular capillaries → renal vein

Nephrons → collecting tubules → renal pelvis → ureters → bladder → urethra

Hormone secretion

- Erythropoietin (EPO)
- Others for blood pressure maintenance

Glomerular filtration rate (GFR): 120 mL/minute; 180 L/day

Epithelial tissue in kidneys is vulnerable to damage with chronic hypertension

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Kidney Disorders

Kidney stones

Pyelonephritis

Renal failure

Bladder and Urinary Tract Disorders

Bladder cancer

Interstitial cystitis

Urinary tract infection

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Kidney Stones

Also called renal calculi, nephrolithiases

- Crystals that develop in renal pelvis
- Caught in ureters may be called ureterolithiases

Demographics

People who are dehydrated

- June–August, especially in southeast United States

Men > women

Whites > other races

1 million stones passed/year

Etiology

Primarily 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%)
- *Struvite stones* 10–15%
- *Uric acid stones* 5–8%
- *Cystine stones* < 1%
- *Other stones*

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more Kidney Stones

Signs and Symptoms	Diagnosis	Treatment	Massage
Silent until they get stuck in ureters. Grabbing pain, renal colic Sudden onset Waves of pain Can lead to nausea, vomiting in sympathetic reaction May refer to groin May be connected to infection: fever and chills **Complications** A stone big enough to interrupt kidney function may lead to acute or chronic renal failure	Radiology, ultrasound, magnetic resonance imaging (MRI), intravenous pyelography	Percutaneous nephrolithotomy Ureteroscopic stone removal Extracorporeal shockwave lithotripsy	Appropriate if no signs are present

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Pyelonephritis

Infection of the nephrons ; May be acute or chronic

Etiology

Usually a complication of UTI (uncomplicated)

May be related to other problems (complicated)

- Structural anomalies
- Pregnancy
- Diabetes
- Neurogenic bladder
- Contaminated surgical or medical instruments

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more Pyelonephritis

Signs and Symptoms	Diagnosis	Treatment	Massage
Acute: rapid onset with fever, burning and frequency, cloudy urine, back pain, fatigue, nausea, vomiting Chronic: may be silent while damage accrues In children may be related to vesicouretral reflux (VUR) **Complications** Scarring Permanent kidney damage Hypertension Risk of renal failure Sepsis	Urinalysis, computed tomography (CT), intravenous pyelography	Antibiotics are usually sufficient	Avoid circulatory work until all signs of infection have been eradicated

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Renal Failure

Kidneys are not functioning adequately, cannot keep up with demands

- Acute
- Chronic

Demographics

People with hypertension, diabetes

African Americans more than whites

An estimated 8 million people in the United States are in early kidney failure

End-stage renal failure (ESRD)

- Diagnosed 102,000 times/year
- 453,000 people in the United States have ESRD
- 324,000 in the United States are in dialysis
- 65,300 on waiting list for kidney transplant

Etiology

Chronic, severe, recurrent problems may cause permanent damage

- Loss of EPO production, electrolyte management, fluid level management can lead to
  - Anemia
  - Peripheral and pulmonary edema
  - Pericarditis and cardiac tamponade
  - Problems with calcium, phosphorus, potassium,
  - Bone density, digestion, inflammation, heart rhythm problems

Acute Renal Failure

Kidney function suddenly drops to 50% or less of normal levels

Prerenal problems

Intrarenal problems

Postrenal problems

Chronic Renal Failure

Normal GFR is 120 mL/minute. Renal failure is a progression along a continuum of lost function:

- *Stage I*: GFR > 90mL/minute
- *Stage II*: GFR = 60–89 mL/minute
- *Stage III*: GFR = 30–59 mL/minute
- *Stage IV*: GFR = 15–29 mL/minute

Stage V: ESRF; GFR < 15 mL/minute

Diabetes and chronic hypertension are leading causes

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more Renal Failure

Signs and Symptoms	Treatment	Massage
Decreased urine output Systemic and pulmonary edema Arrhythmia Anemia Osteomalacia Rash and skin discoloration Lethargy Fatigue Headache Bruising and bleeding Muscle cramps Changes in mental and emotional state	Goals Control the symptoms Prevent further complications Slow the progress of the disease Medication to control diabetes, hypertension, other conditions Dialysis if necessary Transplant 65,300 candidates for 16,000 surgeries	Renal failure contraindicates circulatory massage, although energy work may be supportive Clients undergoing dialysis have access points for the instruments that are vulnerable to infection Massage for transplant recipients may be appropriate, if it fits within the limits of normal activities of daily living Transplant recipients take immunosuppressant drugs

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Bladder Cancer

Development of malignant cells in the urinary bladder.

- Transitional cell carcinoma (TCC)
- Urothelial carcinoma (UC)

Demographics

Number 4 cancer for men; number 10 for women

60,000 diagnoses/year in the United States

12,700 deaths/year

Median age at diagnosis is 73 years

Etiology

Mutations in cells of transitional epithelium that lines the bladder

In the United States most cases are related to environmental toxins

- Cigarette smoking
- Aromatic amines

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more Bladder Cancer

Signs and Symptoms	Diagnosis	Treatment	Massage
Primary sign: hematuria without pain Secondary signs: bladder irritability, compression on rectum, obstructed pelvic lymph nodes	Urinalysis, radiography, cystoscopy, local biopsies	Removal of abnormal tissue, part or all of bladder, maybe other tissues Radiation therapy, chemotherapy Biological therapy **Prognosis** Usually found in early stages Can grow in multiple sites at different rates; high risk of recurrence	Same cautions for any type of cancer Respect challenges of treatment Work with health care team

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Interstitial Cystitis

The urinary bladder becomes small and inelastic. ; May be called IC/PBS (interstitial cystitis/painful bladder syndrome)

Demographics

700,000 to 1 million in the United States

90% are women; 10% are men

Etiology

Healthy bladder holds about 1.5 cups of urine

Urine is composed of water, salts, hormones, wastes

Bladder is shielded from acidity by mucous lining

IC develops when protective shield doesn't work

- Pinpoint hemorrhages: glomerulations or Hunner ulcers
- Decreased capacity
- Bladder walls thicken, become inelastic

Causes are not understood

- Autoimmune?
- Allergy?
- Antiproliferative factor?
- Neurological hypersensitivity?
- Referred pain from perineum muscle?

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more Interstitial Cystitis

Signs and Symptoms	Diagnosis	Treatment	Massage
Chronic pelvic pain Pain and burning on urination Increased frequency, urgency Painful intercourse May subside and return (flare and remission)	Rule out UTI, genital herpes, bladder cancer, kidney stones, urethral diverticula, cervical or uterine cancer, vaginitis, endometriosis, prostate enlargement Cystoscope to look for ulcers or bleeding spots	Symptomatic relief, coping skills Bladder wash with anti-inflammatory Remove lesions Medication to rebuild bladder lining Pain medication Smoking cessation Tricyclic antidepressants Surgery	Fine to reduce anxiety if client can be comfortable

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Urinary Tract Infection

Infection anywhere in the lower urinary system

Demographics

Usually women (short urethra)

In men may indicate sexually transmitted disease (STD) or prostate problem

People who use a catheter

8 million visits to doctor/year

Etiology

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*

Could also be staphylococcal, Klebsiella, chlamydia, mycoplasma, irritation (honeymoon cystitis)

Risk Factors

Spermicides

Diaphragm use

Pregnancy

Diabetes

Neurogenic bladder

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more Urinary Tract Infection

Signs and Symptoms	Prevention	Treatment	Massage
Painful, burning urination Frequency Reduced capacity Cloudy or blood-tinged urine Pelvic, abdominal, low back pain If flank or back pain, consider kidney infection Men may have pain in penis or scrotum	Urinating immediately after sex Wiping from front to back Showers, not baths Avoid hygiene sprays and douches	Hydration Blueberry/cranberry juice (unsweetened) 3–5 days of antibiotics	Circulatory massage is contraindicated until all signs of infection have cleared

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To Test

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