

Adrenal

Addison's disease (hypoadrenalism)

- Adrenal Insufficiencies (cortisol < 10-20 µg/dl)
 - o Weakness, fatigue, hypotension, anorexia, weight loss, hyperpigmentation of skin/mucosa
 - o Pain, stress, anxiety, infection, bleeding
 - o From anything that induces P450 oxygenases (general anesthetics, midazolam, barbs, ketoconazole, etc)
- Lab tests
 - o Plasma cortisol < 10-20ug/dl
 - o CRH, ACTH, dexamethasone suppression

Cushing's Syndrome (Hyperadrenalism)

- Unusual weight gain, moon shaped face, buffalo hump, abdominal striae, hypertension, CHF, osteoporosis, diabetes mellitus, depression/psychosis
- High dose corticosteroids

Dosing

- Minor – 25mg hydrocortisone pre-op day of surgery
- Moderate – 50-75mg hydrocortisone pre-op and following day, return to normal dosing after
- Major – 100-150mg hydrocortisone for 2-3 days post-op
 - o 50mg IV every 8h after initial dose for first 48-72h post-op
- Most procedures can be done without corticosteroid supplementation
 - o Adequate anesthesia, pain management, post-op pain control
- For complex/stressful procedures, anxious patients, significant post-op pain, 2x dose day of treatment
 - o May also 2x dose for following day
- Current research – only supplement dosing for primary adrenal insufficiency

Hepatitis

- Clinical symptoms of acute viral hep are non-specific

Hep B

- Needle stick jab = 30% seroconversion
- HIV = 0.22% seroconversion
- 90% transmission mother to child
- Treat with Lamivudine

Hep C

- Similar transmission to Hep B – blood, hemodialysis, IVDU, transplants, etc
 - o Very often accompanies Hep B (screen for Hep C if patient has Hep B)
 - May remain dormant for ~20y
 - Biomarker = HCV serology > 10months
 - o Sexual transmission = 10-20%
- 80% chronic carrier state (ALT, permanent liver damage)
 - o 40-50% chronic active – acute liver disease, cirrhosis, Hep Ca
 - o 11% hepatocellular carcinoma

Bleeding

- Vascular phase (begins at wound site) → vasoconstriction → platelet phase → coagulation phase (extrinsic and intrinsic) → common pathway → fibrinolytic system
 - o Platelet phase – migrate to wounded area, stick to endothelium to form plug
 - o Extrinsic pathway – activated by extravasated blood in surrounding tissues, tissue thromboplastin
 - PT/INR – factors XII, XI, IX, VIII, X
 - o Intrinsic pathway – contact activation, much slower than extrinsic pathway
 - aPTT – factors VII, X
 - o Common pathway – factors X, V, II, I

Detection of bleeding problems

- History
 - o Past bleeding problems – operations, extractions, injuries, spontaneous
 - o Relatives/family
 - o Medications – ASA, antibiotics, analgesics, anticoagulants
 - o Illnesses – viral, liver, hematologic, etc
- Clinical exam
 - o Habitus – pallor, jaundice
 - o Angiomas, petechiae, ecchymoses, purpura, hemarthroses
 - o Gingival hyperplasia, bleeding
- Lab tests
 - o PT/INR – tissue thromboplastin (extrinsic/common pathways)
 - Control = INR, normally 11-15s
 - Prolonged time (>2.5, 3, etc) = anticoagulant therapy needed
 - o aPTT – contact activator (intrinsic pathway, kaolin)
 - Normally 25-35s
 - Prolonged (>2.5, 3, = 60-70s) = inherited coagulopathies
 - o TT and BT – thrombin time and bleeding time
 - o Platelet count – normally 140-400K/cc
 - Bleeding problems at <50K/cc
- Surgery

Diseases

- Von Willebrand's disease
 - o Chr 13, defect in platelet adhesion
 - vW factor binds to factor VIII – without it, factor VIII is destroyed
 - Autosomal dominant = moderate
 - Autosomal recessive = severe
 - o Genetics, history of bleeding, prolonged BT and PTT, decreased factor VIII efficacy/platelet adhesion
- Hemophilia (factor VIII deficiency)
 - <1% = severe
 - <10% = moderate
 - >10% = mild
 - o 10% of patients develop factor VIII inhibitors = severe
 - o 50% of patients are stable
 - o Most dental surgeries do not require modification (best to check with MD)

Therapies

- Anticoagulation
 - o Heparin ($t^{1/2} > 2h$), hospital only
 - If there's hemodialysis, treat 1 day later
 - LMWH = enoxaparin
 - No INR – no need to alter for dental treatment
- Antiplatelet
 - o ASA level – PFA-100 > 20min (platelet function analyzer)
 - o NSAIDS, Plavix, Aggrastat, etc
 - Usually not a problem for dental treatment unless another bleeding problem is present
- Coumadin (warfarin) – anticoagulant
 - o Age dependent, vitamin K deficiency, requires heparin bridging
 - o May use for postCVA, MI, CHF, congenital HD, arrhythmias, etc
 - Usual therapeutic range – INR = 2.0-3.0
 - Sometimes higher (CVA) INR = 2.0-4.0
 - Most dental treatments are okay with an INR of <3.5
 - o Increased Coumadin sensitivity
 - Vitamin K deficiency (mal-absorption, broad spectrum antibiotics)
 - Displacement of warfarin binding – aspirin, indomethacin, ibuprofen, naproxen, phenytoin, hypoglycemic, estrogen, sulindac, phenylbutazone, tolmentin, fenpropfen, miconazole
 - Synergism with Warfarin – Vitamin E, anabolic steroids, danazol
 - o Blocking of warfarin metabolism
 - Tricyclic antidepressants, erythromycin, cimetidine, sulfa drugs, chloramphenicol, quinidine, phenothiazine, disulfiram

Dental Management

- Medical consult – urgent in INR >3.5
- Usually no special considerations for exam, radiographs, anesthesia, endo, ortho, impressions, fluoride, prophies, simple operaties/crown/bridge
- Consult hematologist
 - o Level of factor VIII deficiency/replacement
 - o Presence of inhibitors or other conditions
 - o Treatment, need for coagulation agents, steroids, hospitalization
- Splints, sutures, infections (antibiotic prophylaxis), local measures (microfibrillar collagen, gelfoam, thrombin), oxycel, surgical
- Hemostatic agents
 - o Avoid anticoagulants (ASA, warfarin/heparin, NSAIDS, etc)
 - Importance of HBV, HCV, HIV, etc
 - o Antifibrinolytics – transexamic acid (oral rinse, tablets, or IV pre-op to control bleeding)
 - Prevents breakdown of fibrin blood clot
 - o DDAVP – synthetic replacement for ADH (nasal spray form)
 - Prevents excessive urination/fluid loss

Pregnancy

- Spontaneous abortions occurs in 15% of pregnancies before 20th week
- Rate increases again in 3rd trimester
- Eclampsia = hypertension, tonic-clonic seizures, is a medical crisis
- Supine hypotension syndrome – late in 3rd trimester, fetus puts pressure on mother's inferior vena cava
 - o Pallor, bradycardia, sweating, nausea, hypotension, dizziness – resolved by lying on her left side

Physiologic changes

- CV, HTN (slight increase), increased blood volume, increased cardiac output, tachycardia, heart murmurs
- Anemia, decreased hematocrit, neutrophilia, increased fibrinogen and factor VIII, increased appetite

Things to Inquire

- History, outcome of other pregnancies and complications, other medical problems, current complications
- First trimester – morning sickness (nausea, vomiting, fatigue, syncope, postural hypotension)
- Second trimester – generally few symptoms/problems
- Third trimester – nausea, fatigue, syncope, postural hypotension, mild depression

Things to be careful about

- Supine hypotension syndrome
- Hypotension
- Bradycardia
- Diaphoresis – uncontrolled sweating
- Nausea
- Weakness
- Dyspnea

Procedures

- Minimal radiographs for immediate emergency diagnosis and treatment
 - o Postpone non-emergency treatment until post-delivery
- No Ca⁺⁺ taken from teeth (could be taken from bone) – no increased caries
- Slight gingival inflammation and tooth mobility
- Increased inflammatory response to periodontal and gingivitis factors
- First trimester – exam, prophylaxis, Scaling/root planing, OHI, urgent care only
- Second trimester – exam, prophylaxis, scaling/root planing, OHI, routine care okay
- Third trimester – exam, prophylaxis, scaling/root planing, OHI, urgent care only – MONITOR VITALS, SHORT APPTs
- Most antibiotics okay – avoid tetracyclines, streptomycin, clindamycin
- Most LAs are okay
- Avoid ASA, ibuprofen (1st and 3rd trimesters), codeine, other narcotics, barbiturates, valium, N₂O
 - o Especially true for 1st trimester
- Only about 1-2% of dose is excreted in colostrum – pharmacologic activity unlikely to be significant in infant

Depression

- Life time risk	33%	>65 y/o risk
- Drug problem	10%	- Anxiety disorder – 20%
- Mood disorder	6-10%	- Depression – 20%
- Anxiety disorders	13%	- Substance abuse – 20%
o Panic attack	3%	Alzheimer's
o Generalized	2-5%	- 64-74 = 3%
- Schizophrenia	1.1%	- 75-84 = 19%
- Cognitive disorder	3%	- >85y/o = 47%

Anxiety – emotional pain/feeling of impending disaster, psychological distress w/o a focus

- A state of apprehension – internal psychological, environmental, disease state, medicine/drug
- Has emotional and/or physical symptoms
 - o Panic attacks – sudden unexpected feeling of terror
 - May be cued (dental office), peaks @ 10min, lasts 20-30min
 - Exaggerated sympathetic response – palpitations, chest pains, trembling, dizziness, sweating, dyspnea, choking, numbness
 - Accounts for 15% of patients who see cardiologist
 - o Phobias
 - o PTSD
 - Increased arousal – difficulty sleeping, irritability, anger, difficulty concentrating
 - Complications – anxiety, depression, drug abuse
 - o Generalized anxiety disorder – persistent diffuse form of anxiety
 - Motor tension, autonomic hyperactivity, apprehension
 - No familial/genetic basis, better outcome than panic attack
 - Can lead to depression and substance abuse

Dental Management

- Behavioural
 - o Establish effective communication
 - o Be open and honest
 - o Explain procedures
 - o Answer questions
 - o Tell what you are doing to do for anesthesia
 - o Discuss what to expect and avoid
 - o Explain complications that can occur
 - o Have patient contact you if complications occur
- Pharmacologic
 - o Oral sedation
 - o Benzodiazepines
 - o Fast acting drugs (triazolam)
 - Take night before appointment
 - Take right before appointment
 - o Effective pain control essential – select appropriate medication
 - o Analgesics
 - o Adjunctive drugs – antidepressants, muscle relaxants, steroids, antibiotics

Drug treatments

- Tricyclic antidepressants
 - o Side effects – xerostomia, constipation, blurred vision, cardiac arrhythmias, allergic reactions, sexual dysfunction, lower seizure threshold, glaucoma
 - o Interactions – other antidepressants, enhances vasoconstrictors, increased CNS depression with barbiturates, benzodiazepines, antihistamines, opioid analgesics, inhibits warfarin (increases INR), interferes with anticonvulsants, blocks cimetidine clearance, blocks erythromycin action, can lead to anticholinergic toxicity from β blockers
- Selective serotonin reuptake inhibitors
 - o Side effects – nausea, nervousness, insomnia, sexual dysfunction, anorexia, diarrhea, xerostomia, orthostatic hypotension, seizures
 - o Interactions – don't use with MAOIs or heterocyclics increased CNS depression with benzodiazepines, sinus bradycardia with β blocker, blocks warfarin (increased INR), blocks cimetidine clearance
- Serotonin and Noradrenergic reuptake inhibitors
 - o Side effects – xerostomia, nausea and vomit, constipation, blurred vision, sexual dysfunction, dizziness, somnolence, mania (bipolar), HTN
 - o Interactions – with SSRIs can cause serotonin syndrome seizures, don't use with MAOIs or heterocyclics
- Monoamine oxidase inhibitors
 - o Side effects – xerostomia, nausea and vomit, constipation, anorexia, fatigue, sexual dysfunction, orthostatic hypotension, HTN crisis, blood dyscrasias
 - o Interactions – other antidepressants, interferes with anticonvulsants, increased CNS depression with barbiturates, benzodiazepines, antihistamines, opioid analgesics, can cause sinus bradycardia with β blockers, HTN with phenylephrine, tyramine foods/drinks
- Benzodiazepines
 - o Side effects – sedation, cognitive impairment, ataxia, muscle weakness, aggressive behavior, impulsive behavior, apathy, dizziness, minor allergic reactions, xerostomia, tolerance and psychological dependence
 - o Contraindications – depressive mood disorders, $^{\wedge}$ OH, pregnant or elderly
 - Patients should not drive or operate machinery (sedation/drowsiness)
- Beta-adrenoreceptor antagonists

Mood disorders

- Depressive disorders
 - o Major depression
 - Depressed most of the day, decreased interest or pleasure in most activities
 - Weight gain/loss, insomnia/hypersomnia
 - Symptoms for >2 weeks, episodes last 8-9 months if not treated
 - Treat via tricyclics, MAO inhibitors, heterocyclics, SSRIs, SNRIs, bupropion
 - o Dysthymic disorders (chronic, milder form)
- Bipolar disorders
 - o Bipolar I – manic, mixed, depressed
 - Lithium carbonate – side effects = GI, tremor, muscular weakness, xerostomia, non-toxic diffuse goiter, hypothyroidism, hypotension, cardiac arrhythmias, polyuria, toxicity with NSAIDs, diuretics, ACE inhibitors, SSRIs serotonin syndrome
 - Valproate
 - Carbamazepine – drowsiness, headache, nausea, orofacial dyskinesia, arrhythmias, photosensitivity, agranulocytosis, hepatotoxicity, toxicity with erythromycin, cimetidine, isoniazid, decreased levels with phenytoin and phenobarbitone
 - o Bipolar II – hypomania [mild mania], depressed
 - o Cyclothymic disorder – hypomania, mild depression

Oral complications

- Manic patients – excessive abrasion, gingival injury
- Antidepressant drug side effects – thrombocytopenia (bleeding, petechiae), leukopenia (infection, ulcerations)
- Consult with physician – determine current status, confirm drugs, determine drugs to avoid/reduce dosage
- Refer severely depressed patients – risk of suicide, may need to share concerns with spouse/relative
- Limit 2 carpals 1:100,000 epi
- Avoid retraction cords, control bleeding
- Reduce dosages of sedatives/hypnotics and narcotics

Cardiovascular

- TIAs → CVAs
 - o 75% survival rate
 - o Sudden interruption of oxygenated blood to brain → necrosis of affected neurological areas
 - o Risk factors – increased age, **uncontrolled HTN**, stress, etc
- #3 cause of death in USA, #1 cause of long term morbidity
- 5% of people >65y/o
- 700K strokes/year, 265K fatal
- 2x risk in smokers, blacks
- 38% of people die
 - o 47% p-CVA die in 1st month
 - o 25% die in 1st year
 - o 50% die by 7 years
 - o >50% survivors have LT disability

Ischemic Strokes

- 60-80% of cases
- CVD primary risk factor – increased risk of emboli development

Hemorrhagic Strokes

- 15% of cases
- HTN primary risk factor
- Higher mortality – 38-47%

Risk Factors

- HTN, CHF, IDDM, previous CVAs/TIAs, >75y/o, hypercholesterolemia, coronary atherosclerosis, smoking
- Diet, obesity, physical inactivity, cardiac abnormalities, elevated homocysteine levels, elevated hematocrit, elevated antiphospholipid antibodies, periodontal risk
- Most people recover from some so rot neurologic impairment, acute risk period up to 6months after first event

Events related to CVA

- TIAs – <10min
- Reversible ischemic neurologic deficit (RIND) – symptoms don't clear within 24h, but full recovery made
- Stroke-in-evolution – symptoms present for several hours and are worsening
- Completed stroke – symptoms remain stable

Questions

- Speech problems, balance, duration of symptoms
- History of HTN/CVD, diabetes, smoking
- Drugs – aspirin, Coumadin, Plavix

Lab tests

- Urinalysis, blood sugar (diabetes), CBC, erythrocyte sedimentation rate (risk of emboli), serologic tests for syphilis/cholesterol/lipids, EKG, chest radiographs (rule out pulmonary emboli)
- CT/MRI for extent of brain injury, CSF pressure to rule out subarachnoid hemorrhage

HIV

- 37mil cases of HIV global
- 60% in Africa, 50% of hospital beds in Africa are for AIDS
- Incubation period for AIDS
 - Transfusion recipients – 7y
 - Hemophiliacs – 10y
 - Injecting drug users – 10y
 - Homosexual/bisexual men – 8-12y
- Within 20 years, 85% manifestation

CDC count	CD4 ⁺ %	
>600	32-50%	Normal
<500	<29%	Initial immune suppression Initial viral therapy
<400		Manifestations of opportunistic infections
200-400	14-28%	Major opportunistic infections
<200	<14%	AIDS diagnosis

- AIDS defining diseases
 - Pneumocystis pneumonia 38%
 - HIV wasting syndrome 18%
 - Loss of 10% body weight in <30days
 - Candidal esophagitis 14%
 - Kaposi's sarcoma 10%
 - TB 10%
 - Lymphoma 10%
 - Viral herpesviridae, CMV, HPV, pox family
 - Neurologic – AIDS related pain (neuropathy, myelopathy)

Opportunistic infections

- Pneumocystis carinii pneumonia
- Toxoplasmic encephalitis
- TB
- Mycobacterium avium complex (MAC)
- Streptococcal pneumonia
- CMV
- Candidiasis
- Cancer

Therapy

- HAART
 - 2 NRTIs + PI, 2 NRTIs + NNRTI
 - 3 NRTIs
 - Monotherapy is NOT acceptable
- Resistance to HAART has been increasing
- Failed therapy – rising viral load, falling CD4 count, symptoms, ADEs
 - ALWAYS add at least TWO drugs to regime
- NRTI – adefovir

Treatment

- HIV1 untreated patients – usually viral load stabilizes at 1000-10,000 copies/mL
 - o AIDS levels >1million copies/mL
 - o 28% of newly infected HIV patients are resistant to +1 anti-AIDs drug

Medical Management

- Viral load – level of ciremia, efficacy of HAART, disease progression, prognosis
 - o Influences treatment planning
 - o Does not determine need for prophylaxis
- Platelets >50,000/mm³ – safe for dental extractions
- CD4⁺ count <500mm/mL – prophylaxis

Oral Infections indicating immunosuppression

- Candidiasis
 - o >45% of AIDS patients
 - o Related to other oral diseases – caries, perio disease, HSV
 - o Proportional to low CD4⁺ count
 - o Predictive of rapid progression to death
- Oral hairy leukoplakia
 - o Chemotherapy
 - o Organ transplant
 - o Autoimmune disease
 - o Often an indicator that AIDS will develop shortly
- Kaposi's sarcoma
 - o HHV8
 - o Condyloma acuminatum
 - o Transmission via HPV DNA in sperm (32% of men)
- Non-hodgkin lymphoma
- Periodontal disease – linear gingival erythema, ANUG
- Other infections
 - o Angular cheilitis (HIV) → erythematous candidiasis (AIDS)
 - o Herpes simplex and herpes zoster – shingles outbreak in AIDS patients
 - o Major aphthous lesions

Transmission

- HIV Patient → provider = 10/year (0 documented for dentists)
- Hep C patient → provider >1000/year
- Needle sticks – average >\$600 follow up
 - o >4000 incidents, >10 seroconversions
- Test for HBsAg, anti HCV, HBV, HIV antibody
 - o Check patient history of infection/vaccination, evaluate exposure sources
 - o Immediate care to exposure site – flush mucous membranes with water
 - Mucous small volume (few drops) or large volume (major blood splash) – different guidelines
 - o Determine risk of type of transmission (blood, water, mucous, etc)
 - o Report exposure, present to medical center for testing
 - o Documentation for workers compensation and disability claims

Renal

- Commonly from diabetes and HTN
- ESRD
 - o Uremia – retention of excretory products and interference with endocrine and metabolic functions
 - o Azotemia – buildup of non-nitrogenous waste compounds (urea)
 - o Acidosis – accumulation of acids from renal tubular impairment (nausea, anorexia, fatigue)
 - o Hyperventilation – respiratory compensation for acidosis
- Lab findings
 - o Increased – BUN, creatinine, protein, K^+
 - o Decreased – Na^+ , GFR (<50%)
- Urinalysis
 - o Colour – bile, hemoglobin, protein
 - o Appearance – clear protein, WBCs, bacteria
 - o Specific gravity – hydration, IDDM, etc
 - o pH – renal insufficiency
 - o protein – IDDM, infections, chronic inflammation
 - o glucose – IDDM, NIDDM
- Hematologic
 - o Anemia – <erythropoietin + adverse/toxic effects of uremia on RBCs
 - o Infections – <WBCs (# and function)
 - o Bleeding – <platelet aggregation, <platelet factor III
- Oral complications
 - o Pallor, xerostomia, SGF and infections
 - o Candidiasis, hair tongue (indicative of ESRD), dysgeusia, mucositis (erythroplakia, ulcers)
 - o Osteitis fibrosa cystica, renal osteodystrophy, osteomalacia, radiolucencies, osteosclerosis
 - o Enamel hypoplasia, delayed tooth eruption, enamel erosion
- Symptoms
 - o Mental depression, slowness
 - o Muscular abnormalities, hyperactivity, seizures
 - o GI, oral soreness/xerostomia
- Signs
 - o Mucosal stomatitis, pallor, ulcers
 - o Hyperpigmentation
 - o Uremic frost
 - o Petechiae, ecchymoses
 - o HTN, dyspnea, peripheral edema, CHF
 - o Retinal abnormalities, visual disturbances

- Medical Treatment

- Conservative diet – restrict protein, supplement Na^+ , K^+ fluids, Ca^+ , vitD
- Dialysis – artificial filtration of blood when kidneys fail
 - Peritoneal dialysis
 - Every day
 - Hemodialysis
 - Every 2-3 days for 3-5h per session
 - Do not treat on day of hemodialysis
 - Surgical arteriovenous fistula
 - Blood circulated through dialysis machine – combined with donated blood and heparin
 - Complications
 - Infections – staph, HBV, HCV, HIV
 - Endocarditis, endarteritis
 - Bleeding – heparin, anemia, RBC destruction, thrombocytopenia
 - Dental management
 - Medical consult needed
 - Status of antibiotics, lab tests for bleeding (platelets, BT)
 - Level of control, HTN, arrhythmias, may require hospitalization
 - Careful with analgesics and antibiotics if GFR < 60
 - Avoid NSAIDS, narcotics, nephrotoxic drugs, cephalixin
 - Avoid tetracycline, acyclovir, acetaminophen/aspirin, penicillin
 - Monitor BP, assess liver function
 - Prophylax is abscess is present
 - Oral infections must be treated aggressively

Rheumatic Heart Disease

- Immune reaction to strep attacking heart valve
 - o Fibrosis → calcification → scarring (mitral or aortic)
 - o Damaged and dysfunctional leaflets → murmur, ventricular dilatation and hypertrophy, CHF
- Other concerns
 - o Heart failure
 - o Infective endocarditis
 - o Endarteritis
 - o Excessive bleeding
 - o Cyanosis
 - o Infection
- Infective endocarditis – infection of endothelial lining resulting in severe systemic infection
 - o >80% streptococcal, usually mitral valve
 - o Fever, chills, night sweats, arthralgia, murmur, weakness, fatigue, malaise, anemia, visual problems, GI, weight loss, angina, hematuria, praesthesias, paralysis, osler nodes, janeway lesion, retinal hemorrhages
- Prophylax...
 - o Prosthetic heart valves
 - o Previous IE
 - o Cyanotic CHD – includes cardiac transplantation who develop cardiac valvulopathy
 - o Aortic valve disease
 - o Surgery <6months
- Dosing
 - o Amoxicillin – 2g, 30-60min pre-op
 - o IM/IV ampicillin – 2g, 30min pre-op
 - o Clindamycin – 600mg, 30-60 pre-op
 - o Cephalexin – 2g, 60min pre-op
 - o Administering antibiotics up to 2h after op may help prevent IE
 - o Prophylaxis duration = 10days – want to do as much treatment as possible during coverage period
- Notes
 - o Dental treatment should be completed before cardiac surgery
 - o Refer to MD for CHD corrected with prosthetic material/devices

Hypertension

- Risks
 - Recent MI, unstable angina, uncompensated CHF, uncontrolled HTN, significant arrhythmias, severe valvular disease, >80y/o
 - 75.6% of medical emergencies in dental operator from stress/anxiety and sudden pain

Normal	Pre-HTN	Stage 1	Stage 2
120/80	139/89	159/99	>160/>100

- Target organ disease
 - Heart disease
 - LVH
 - Angina, prior MI
 - Prior coronary revascularization
 - Heart failure (75% from HTN)
 - Stroke or TIA
 - Nephropathy
 - Peripheral arterial disease
 - Retinopathy

Treatment

- Dietary, smoking reduction, Δ OH reduction, low salt diet, exercise, weight control
- Thiazide diuretics, ACEI, β blockers, Ca^{++} channel blockers, ARBs, combinations
 - Targets degree of BP elevation, target organ damage, CV disease presence, risk factors
- Normal BP – recheck every 2 years, dental okay
- Pre-HTN BP – recheck every year, dental okay
- Stage 1 – recheck every 2 months, dental okay
- Stage 2, >2 – refer to MT, no treatment

Interactions

- Orthostatic hypotension
- NSAIDS may interfere with anti-HTN effects
 - Long term use
 - With naproxen/ibuprofen, β blockers and diuretics

Dental Considerations

- BP < 180/110
- Family history, complications, control/compliance
- Check BP after injection, inject slowly and don't use epi (retraction cord, etc)
- Avoid erythromycin/clarithromycin with Ca^{++} channel blocks (hypotension)
- Avoid NSAIDS, epi/levonordefrin, reduce patient stress

Medication Side effects

- Diuretics – K^+ , xerostomia, sexual dysfunction, >uric acid
- β blockers – orthostatic hypotension, headaches, dizziness, depression, bradycardia, fatigue, insomnia, <HDL, xerostomia, sexual dysfunction, inhibit vasodilation
- Vasodilators – headaches, tachycardia, fluid retention, skin rashes

Cardiac Arrhythmias

- General causes
 - o ASCAD, other CVD, pulmonary (COPD), autonomic disorders, thyroid disease, systemic disease, drug effects, electrolyte imbalance

<ul style="list-style-type: none"> - Signs <ul style="list-style-type: none"> o Rapid/slow pulse o Irregular rhythm o Weak pulse - Symptoms <ul style="list-style-type: none"> o Palpitations, dizziness, syncope, angina, dyspnea, fatigue - Atrial fibrillation <ul style="list-style-type: none"> o Common, may [or may not] be serious o Irregular ventricular response o Poor atrial transport o Emboli 	<ul style="list-style-type: none"> - Medications <ul style="list-style-type: none"> o Digoxin – slows AV node conduction o Digitoxin – more powerful digoxin o Quinidine – depresses ectopic o Procainamide – ventricular arrhythmias o Verapamil – regulates Ca^{++} in slow channels o Soltalol/propranolol – βblockers o Disopyramide – depresses autonomic o Lidocaine – emergency treatment
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- Bleeding problems from Coumadin
 - o 50% of dental problems with bleeding
 - o Age dependent
 - o Strength and duration of Coumadin
 - o Reduction of bleeding with proper anticoagulant monitoring – guideline based recommendations
- Arrhythmia management
 - o Close monitoring
 - o Stress/anxiety reduction
 - o Open/honest communication, short non-stressful appointments
 - o Limit/avoid epi, consider premedication (diazepam, N_2O)
- Screening
 - o History, medications, status, monitoring
 - o Physical evaluation, medical consult

Pacemakers

<ul style="list-style-type: none"> - Symptomatic sinus bradycardia - Symptomatic AV block - Tachycardias refractory to prescription therapy - Type of pacemaker 	<ul style="list-style-type: none"> - Type of arrhythmia - Degree of shielding - Date of/complications from implantation
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Dental Management

- Provide good analgesia, no need to prophylax
- Coumadin associated bleeding tendencies, no problems with epi at controlled doses
- EM interference caution from some dental equipment on pacemakers
- Limit epi and levonodofrin, watch for digoxin toxicity

Thyroid

- Primary goiter – simple goiter, thyroid cancer
- Thyrostimulatory secondary goiter – Grave's disease, Hashimoto's thyroiditis, congenital hereditary goiter
- Thyroinvasive secondary goiter – hashimoto's thyroiditis, subacute painful thyroiditis, Riedel's thyroiditis, metastatic tumors to thyroid

Info

- o Hashimoto's – autoimmune
- o Subacute painful – viral infection
- o Acute suppurative – bacterial infection
- o Chronic fibrosing (Riedel's) - unknown
- 5x more likely in females

Hormones

- T3 – triiodothyronine
- T4 – thyroxine
 - o Both require iodine – MDR = 75mg
 - o Stored in thyroid
- Calcitonin

Hyperthyroidism – thyrotoxicosis

- Excess T3/4 in blood
- Excess/ectopic thyroid tissue
- Graves disease, thyroid adenoma, pituitary disease, multimodal goiter
- Symptoms
 - o Nervousness, fatigue, weakness
 - o Palpitations, tachycardia, sweating/heat intolerance, weight loss, increased appetite
 - o Dyspnea, exophthalmos
- Signs
 - o Tachycardia, A fib, goiter, skin problems
 - o Tremor, exophthalmos, bruit over thyroid
 - o Posterior dorsal tongue tumor, midline nodules
- Thyrotoxicosis
 - o Cardiovascular problems, Arrhythmias, tachycardia, cardiomegaly, angina, CHF
 - o Ocular problems with thyrotoxicosis, exophthalmos, retraction of upper eyelid
 - o Neurological problems
 - o Skin erythema, hyperpigmentation, thin, fine hair, alopecia
- Cardiovascular – palpitations, tachycardia, arrhythmias, cardiomegaly, CHF, angina, MI
- CNS – anxiety, restlessness, sleep disturbances, tremors, increased diabetes risk, thrombocytopenia, sweating
- Treatment
 - o Hyperthyroid acute phase – propylthiouracil, methimazole, propranolol, dexamethasone, lithium
 - o Hyperthyroid second phase – surgery, radioiodine

- Thyrotoxicosis – overmedication from levothyroxine
 - Medical complications – sensitive to epi, lethal arrhythmias, CHF, HTN, MI
 - Sudden onset, surgery/infection/trauma, nausea/vomit/fever, tachycardia, HTN followed by hypotension, coma, death
 - Emergency treatment – CPR, hydrocortisone, cool down body temp, IV glucose, propylthiouracil
 - Oral complications – osteoporosis, increased caries/perio, rapid jaw/tooth development
 - Dental management – determine nature/causes/severity, past therapies, meds, current status
 - Medical consult, avoid epi, monitor vitals, stress management, surgery/infections, aggressively treat infections, avoid thyrotoxic crisis
 - Antithyroid drug side effects – rash, pruritus, fever, arthralgias
 - Sometimes agranulocytosis (fever, sore throat, oral ulcers) and hepatitis (jaundice)

Hypothyroidism – myxedema (Cretinism)

- 5x more common than hyperthyroidism
- Careful of thyrotoxicosis in patients on levothyroxine
- Cretinism (kids) – dwarfism, overweight, large lips/tongue, hoarse, tubby hands, pale skin, mentally retarded, eyes wide apart, broad nose, malocclusion, delayed tooth eruption
 - Congenital or acquired – thyroid/pituitary failure, radiation, thyroid removal, excessive anti-thyroid med
- Clinical manifestations
 - Myalgia, fatigue, anemia, constipation, weight gain, cold sensitivity
 - Medical problems exasperated by dental treatment
 - Exaggerated response to CNS depressants
 - Myxedema coma – from infection, stress, cold, trauma, surgery, CNS depressants (narcotics, barbiturates, tranquilizers)
- Treat with
 - Levothyroxine (T4) or liothyroxine (T3)

Diabetes

<ul style="list-style-type: none"> - Fasting Blood Glucose <ul style="list-style-type: none"> o WNL – 90-120mg/mL o Diabetes >126mg/mL - 2hr post-prandial blood glucose <ul style="list-style-type: none"> o WNL – 90-120mg/mL o Diabetes > 200mg/mL 	<ul style="list-style-type: none"> - HbA1c – glycosolated hemoglobin – long term glycemic control (3moths) <ul style="list-style-type: none"> o <6 = WNL o <7 = borderline DM o <9.5 – poor glycemic control o <11.5 – extremely poor control o >11.5 – danger signs
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- Diabetes diagnosis
 - o History of disease, severity/complications, level of control, monitor (blood, urine), insulin reactions

Type 1 – absolute <ul style="list-style-type: none"> - Symptoms <ul style="list-style-type: none"> o Polydipsia, polyuria, polyphagia, weight loss, fatigue, malaise o Skin infections, irritability, bizarre behavior, headache, drowsiness, xerostomia, acetone 	Type 2 – relative <ul style="list-style-type: none"> - Xerostomia, weight gain/less, nocturia, vulvar puritis, visual problems (blurred), paresthesias, postural hypotension
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Systemic complications

- Accelerated atherosclerosis – large vessels and microangiopathy
- Glomerulonephritis, glomerulosclerosis, nephrosclerosis, renal insufficiency
- Retinopathy, cataracts, glaucoma, blindness
- Peripheral neuropathy (motor and sensory)
- Xanthoma diabeticorum, furunculosis, pruritis, skin infections (necrosis)
- HTN, renal failure, CAD, CVA, CHF
- Gangrene of extremities, blindness, neuropathies (myalgia, cramps)
- Spontaneous abortions

Oral Complications

- Xerostomia, SGD, parotid hypertrophy, increased salivary and GCF glucose, increased caries, gingivitis, perio, oral infections, poor wound healing, neuralgias (BMS)

Medical management

- Diet, exercise, medication (hypoglycemic, insulin), pancreatic transplants (w/ kidney or beta cells)
- Activity enhanced by – salicylates, ^OH, dicumarol, propranolol, sulfonamides
- Activity diminished by – corticosteroids, epi, BCPs, thyroid preparations, furosemide
- Want to maintain normal diet, if food intake is decreased then decrease insulin intake
- Encourage alternative diet (shakes, liquid supplements) if normal diet cannot be maintained
- Prophylaxis not required, unless patient is poorly/uncontrolled

Dental Management

- Careful of oral candidiasis if patient is on antibiotics
- Epi increase blood glucose
- Careful of hypoglycemia from insulin (possibly insulin shock)
- Ketoacidosis (deep/rapid breathing) – medical emergency

Allergies

- Common dental drugs – antibiotics, analgesics, anesthetics, sedatives, fluoride
- PCN, erythromycin, clindamycin, cephalosporins, metronidazole, acyclovir, nystatin, ketoconazole, clotrimazole, codeine, other narcotics, NSAIDs, ASA
- Predictable reactions – side effects, toxicity, secondary effects, drug interactions
- Unpredictable – intolerance, idiosyncratic, allergic, pseudoallergies

Types

- I – IgE mediated - anaphylaxis
 - o 10% of population, hay fever, asthma, angioedema, smooth muscle bronchi contraction, histamine release, hypotension, respiratory distress, rapid onset
 - Early – urticarial pruritis
 - Laryngeal edema, itching palate
 - Nausea/vomit/anorexia
 - Dyspnea, bronchospasm
 - Hypotension arrhythmias
- II – cytotoxic
- III – immune complex
- IV – cell mediated

Allergies

- History of drug allergies increases risk of developing new allergies
 - o 80% of all new drug allergies to PCN, ASA, sulfa
- Fatal anaphylaxis from dental RXs
 - o #1 PCNs (75% of all fatal anaphylactic reactions), ASA, tetracyclines, cephalosporins, local anesthetics
 - Allergic reactions occur in
 - 0.1% oral penicillins
 - 1-2% IM
 - 5-12% TOPICALS
 - 1/500 of ALL reactions
 - Immediate <1hr – anaphylaxis
 - Accelerated 1-72hr – mild \pm edema
 - Delayed >72hr – mild skin, maybe drug fever
 - Time, severity – mild, moderate, severe
 - Cross reaction with cephalosporins =15%

LA Anesthetics

- Toxic signs and symptoms
 - o Nervousness, talkative, restless, tremor, excitement, nausea, sweating
 - o Slurred speech, disorientation, hypotension, bradycardia, vomiting, depression, convulsions, coma, respiratory collapse, death
- Psychomotor reactions
 - o Vasovagal – anxiety, pallor, bradycardia, sweating
 - o Hyperventilation – rapid, shallow breathing, tremor, anxiety
 - o Sympathetic stimulation – tremor, anxiety, tachycardia, hypertension
 - o NO convulsions

ASA Allergic Reaction

- Manifests like IgE mediated reactions, but do not appear to be immunologic mechanisms
- Histamine release – mild skin, but may progress to bronchospasm and anaphylaxis
 - o Other analgesics may cause similar reactions
- Confused with GI upset
- Asthma – avoid ASA and NASIDS – may precipitate asthma attack
 - o Use acetaminophen (\pm codeine)

Allergic stomatitis/dermatitis

- Topicals – antibiotics, antifungals, benzocaine
- Metals – Ni, Ai, Pd, Ag
- Systemics – antibiotics, antifungals
- Detergents – hand soaps
- Dental materials – cements, acrylic, latex (rare), impression compounds
- Food – spices, berries, nuts, gum