

Drugs Contraindicated During Pregnancy

- | | | |
|---|---|-----------------------------|
| 1. ACE Inhibitors or ARBs | 2. Nitroprusside | 3. Oral hypoglycemics |
| 4. Warfarin (ok in 2 nd trimester) | 5. Phenytoins | 6. Valproic acid |
| 7. Carbamazepine | 8. Lithium | 9. Systemic retinoids |
| 10. Methotrexate | 11. Misoprostol | 12. NSAIDS (except Aspirin) |
| 13. Danazol | 14. Anticholinergics | 15. Cyclophosphamide |
| 16. Antibiotics: | Aminoglycosides, Quinolones, Tetracycline, TMP/ SMX, Metronidazole (1 st trimester), Chloramphenicol, Nalidixic Acid | |

ok coughmeds
 Chlorpheniramine
 Benadryl
 Guaifenesin
 Dextromethorphan

Safe Abx: PCNs, cephalosporins, erythromycin, clindamycin, nitrofurantoin, acyclovir

- Phenobarb OK

Hypertension in Pregnancy

	Chronic	Gestational	Preeclamsia
Onset	< 20 weeks	> 20 weeks	> 20 weeks
Proteinuria	-	-	+
Urate > 5.5 mg	-	-	+
Thrombocytopenia	-	-	+/-
Liver dysfunction	-	-	+/-
Other complications	-	-	Seizure, DIC, renal failure, CNS & liver hemorrhage, HELLP

Best Tx:
 - α-Methyl dopa
 (Labetalol)
 (CCB's)

- induce delivery

Eclampsia
 Tx: Mag-Sulfate

Liver Disease in Pregnancy

1. Intrahepatic cholestasis
2. Acute fatty liver of pregnancy
3. Preeclamsia and eclampsia
4. HELLP syndrome
5. Viral hepatitis

- present @ 3rd trimester
 ↑ ALP Phos
 Bili < 6
 Tx: cholestyramine
 AST/ALT: normal or slightly ↑

↑ Hemolysis (microangiopathic)
 Elevated Liver Fx → terminate pregnancy
 Low Platelets

↑ Bilirubin
 AST/ALT < 500
 U/s → fatty infiltration
 - cause hepatic encephalopathy
 + DIC
 Tx: Terminate pregnancy

Contraindications for Pregnancy

Mitral Stenosis
 - diuretics
 - β-blockers if tachycardia or Dig
 - severe symptoms

valvuloplasty during 2nd trimester
 - cardioversion if in Afib

AS
 - symptomatic before 2nd trimester
 terminate pregnancy

1. Eisenmenger's syndrome
2. Severe AS or severe MS
3. Severe PAH with PA pressure > 70% of systemic pressure
4. Marfan's syndrome with dilated aortic root ≥ 40 mm
5. CHF with LVEF < 40% or NYHA class II or higher
6. Previous peripartum cardiomyopathy with persistent LV dysfunction or severe episode of heart failure

⊖ → ⊕ shunt becomes ⊕ → ⊖ shunt

Normal Findings

- 1) S₃
- 2) ↑ JVP
- 3) Pedal Edema
- 4) Functional systolic murmur
- 5) Early peaking systolic EMurmur

Anticoagulation in Pregnancy

- most common cause of DVT in pregnancy
↓
Factor V Leiden

1. Adjusted dose S/C q 12h unfractionated heparin throughout pregnancy. PTT 6 hr after the dose 1.5 to 2.3 times the control or anti-Xa heparin level .35 to .70 u/mL.
2. Adjusted dose S/C LMWH throughout pregnancy in doses adjusted according to weight or to a 4hr post injection anti-Xa heparin level of .6 to 1.0 IU/mL Patients should be switched to S/C unfractionated heparin 2 weeks prior to expected delivery
3. Unfractionated or LMWH until 13th week; change to warfarin until middle of 3rd trimester and then restart unfractionated or LMWH

Heparin is restarted 12 hrs post caesarean and 6 hrs after vaginal delivery. Start warfarin after delivery and discontinue heparin when INR reaches 2-3

Ashtma in Pregnancy

- steroids OK
- maintain $PO_2 > 60$ @ all times
- if pH < 7.35 or $pCO_2 > 738$
↓
severe asthma retaining pCO_2

Normal Pregnant ABG

PO_2 - Normal
 pCO_2 - ~30 } compensated resp. alkalosis
 HCO_3^- - ↓

Women at High Risk of Gestational Diabetes

- control DM tightly before conception + throught pregnancy

1. Age > 30
2. Hypertension
3. Obesity
4. Glycosuria
5. Previous H/O of Gestational diabetes
6. History of diabetes in first degree relatives
7. Women with previous macrosomic, malformed or stillborn infants

of a contraindication to future pregnancies
- 32 y.o. woman w/ Type I DM on ACEI's / Insulin wants to get pregnant
Hgb A1c - 7.5%
↓
O/C ACEI's + Intensity Insulin

- pregnant pt. w/ cardiomyopathy
↓
ACEI's
Tx: Hydralazine

Choice of Contraceptives

↑ menstrual bleeding/spotting during 1st 3 months

- Vasectomy or tubal ligation → 0.5% 10-year failure risk
- IUD (copper, levonorgestrel) → good for pt's w/ coagulopathy history
- Depot medroxyprogesterone → 99% effective → good for women who cannot take estrogen
- Estrogen-progesterone Pills (monophasic, biphasic, triphasic) → Best choice - takes 6-10 months for return to fertility
- Weekly patch
- Monthly vaginal ring
- Progestin pills ↑ Failure rate
- Diaphragm, condom (male, female), cervical cap

15 y.o. woman w/ 2-months of amenorrhea w/h/o tubal ligation 4 yrs. ago
↓
Pregnancy Test

woman w/ vaginal spotting + crampy abd. pain after 1st missed period
- pregnancy test ⊕
↓
u/s for/o ectopic pregnancy

Uses of Oral Contraceptives

1. Contraception
2. Dysmenorrhea
3. Heavy menses
4. Premenstrual syndrome
5. Endometriosis
6. Perimenopausal women
7. Hyperandrogenic states & hirsutism
8. Emergency postcoital contraception

→ 2 tabs 12 hrs apart w/in 5-days of intercourse (Lo-oral)

- woman on OCP's x 10 yrs. presents in shock
Dx: Ruptured Liver Adenoma

- 16 y.o. female wants OCP's can you w/out parental consent?
- Yes

Complications of Oral Contraceptives

1. DVT & PE
2. Thromboembolism after surgery
3. CVA
4. Hypertension
5. Peliosis hepatis
6. Cholestatic jaundice
7. Cholelithiasis
8. Hepatocellular adenomas
9. Choloasma
10. Myocardial infarction

Blood-filled cysts

unknown cause or mechanism
 ↑
 primary dysmenorrhea
 - Tx: NSAIDs
 - pain onset during menstrual cycle
 if success w/ NSAIDs
 ↓
 OCP's

Contraindications for Oral Contraceptives

Absolute

1. Previous thromboembolic disorder
2. CVA or CAD
3. Known or suspected carcinoma of breast
4. Known or suspected pregnancy
5. Undiagnosed abnormal genital bleeding

Relative

Hypertension, migraine, diabetes, uterine leiomyoma, sickle cell, hyperlipidemia, elective surgery, smoker > 35 years, risk factors for MI

34 y.o. woman w/
 infertility + severe
 dysmenorrhea w/
 dyspareunia + tender
 nodules along the
 uterosacral ligament
 + enlarged cystic
 ovaries

Thick Endometriosis

Best Test → Laparoscopy

Tx: NSAIDs or OCP's

Failure → Leuprolide

Case Histories in Alcoholism

1. Mental Confusion + Unsteady Gait + Inability to Abduct Both eyes
2. Vomiting + Fever + Jaundice + ↑AST (< 300) > 2 fold ALT
3. Pigmented Rash over Exposed Area + Diarrhea + Forgetfulness
4. Cardiomegaly + CHF + Muscle Weakness + ↑CPK + Hemolysis
5. Tetany + Hypocalcemia + Hypokalemia → Hypomagnesemia
6. Anxiety + tremors + ↑HR + Confusion + Delusion + Hallucination
7. Depression + ↑GGTP + ↑MCV + ↑Uric Acid + ↑HDL + ↑TG
8. Vomiting + Abdominal Pain + Anion Gap Acidosis + Ketones + ↑Glu
9. Dyspnea + tachycardia + bounding pulses + rales in both lungs + peripheral edema + cardiomegaly

Alcoholic Hepatitis

Hypophosphatemia

Chronic EtOH

→ Wernicke's Encephalopathy
 Tx: Thiamine

→ Niacine Defic. (Pellagra)
 3 D's
 { Diarrhea
 Dermatitis
 Dementia
 → withdrawal

→ Alcoholic ketoacidosis
 Tx: IV glucose

→ Wet Beri-Beri

At-Risk Drinking

> 14 drinks Qwk → men
 or > 4 drinks QDy

> 7 drinks Qwk → women
 or > 3 drinks QDy

Causes of Death in Alcoholics

1. Heart disease (arrhythmias, em)
2. Cancer: Esophagus, stomach, head & neck, liver, pancreas, breast
3. Accidents
4. Suicide
5. Liver disease

Depression in EtOH
 Tx: SSRI's

Complications of Cocaine Addiction

-N/V, sweating, ↑id salivation, ↑id lacrimation, cough, dyspnea
HR=40
Restless tremors/fasciculations

1. Vascular thrombosis
2. Seizures
3. Hypertension
4. Arrhythmias
5. Rhabdomyolysis
6. Myocarditis
7. Hyperthermia
8. Nasal septal perforation & atrophy
9. Sinusitis
10. Respiratory depression
11. Liver necrosis
12. Sexual dysfunction
13. Crack smokers: Cough, hemoptysis, pulmonary edema (noncardiogenic)
14. Pregnancy: Abortion, premature delivery, stillbirth, abruptio placentae

↑
most common drug causing seizures

-chronic use → depletion → Depression

Ⓛ constricted pupils
Ⓐ organophosphate poisoning

Ⓙ Atropine + Pralidoxime
↓
cholinesterase Inhib.
↓
↑ Ach levels

Risk Factors for Noncardiac Surgery (ACP Guidelines)

	Points
MI < 6 months	10
MI > 6 months	5
Class IV angina	20
Class III angina	10
Critical aortic stenosis	20
Pulmonary edema < 1 week	10
Pulmonary edema any time	5
Age > 70 years	5
Poor general condition	5
Rhythm other than sinus	5
> 5 PVCs on EKG	5
Emergency surgery	10

MI < 1 month ago → ↑ risk

Heroin

-acute pulm. edema

Narcotic OD

-drowsy
-shallow resp.
-spasticity
-constricted pupils

resp. failure

Ⓙ Narcan / IVFs

LSD

-tachy cardia
-HTN
-pupillary dilation
-panic attack
-chronic use → schizophrenia

Ecstasy

-tachycardia/HTN
-hyperthermia
-delirium
-↑ risk of ICH/aortic dissection

Class I (0-15 points), Class II (20-30), Class III (>30)

Class 1 (0-15 points) | **Class II (20-30)** | **Class III (>30)**

Correct underlying risk before surgery

Determine eligibility for coronary revascularization (decision independent of noncardiac surgery)

Nonvascular surgery | Vascular surgery
Proceed with surgery | collect low risk variables

(Age > 70, H/O angina, Diabetes, Q waves on EKG, H/O MI, ischemic changes on resting EKG, Hypertension with severe LVH, H/O CHF)

0-1 variable
Proceed with surgery

2 or > variable
Perform dipyridamole stress thallium or Dobutamine stress ECHO before surgery

Ex) 72 y.o. woman w/ DM secondary lifestyle, asymptomatic needs AAA repair, decent HgbA1c
Class I (ACP)
HR control + surgery per ACC/AHA

Clinical Predictors of Increased Perioperative Cardiovascular Risk (2007 ACC/AHA guidelines)

Major Risk Factors

1. Unstable coronary syndrome including unstable or severe angina or recent MI
2. Decompensated heart failure
3. Significant arrhythmias
4. Severe valvular disease (AS, MS)

Other Risk Factors

1. History of ischemic heart disease
2. History of cerebrovascular disease
3. History of compensated heart failure or prior heart failure
4. Diabetes mellitus
5. Renal insufficiency

Canal surgery
re-evaluate ←

Ex.) 60y.o. woman w/ past MI
undergoing elective hernia
repair
EKG → old IwMI w/
ST ↓'s/T-wave inversions
in several leads
& chest pain

Thienop
Plavix and
got to surgery

Balloon Angioplasty → delay elective
surgery x 2 wks.

BMS → delay elective surgery x 30 days

DES → delay elective surgery x 1 yr.

METs of Various Activities

METs 1-4

- Activities of daily living (eating, dressing, using a toilet)
- Walking around the house
- Walking a block or 2 on level ground at 2-3 mph
- Light housework, such as dusting or washing dishes

METs 4-10

- Climbing a flight of stairs or walking up a hill
- Walking on level ground at 4 mph
- Running a short distance
- Heavy housework, such as scrubbing floors, lifting, or moving furniture
- Moderate recreational activities, such as golf, bowling, dancing, double tennis, or throwing a baseball or football

METs > 10

- Strenuous sports, such as swimming, singles tennis, football, basketball, or skiing

Surgical Procedures

High Risk (cardiac risk $> 5\%$)

Aortic and other major vascular surgery
Peripheral vascular surgery

Intermediate Risk (cardiac risk 1- 5%)

Carotid endarterectomy
Head and neck surgery
Inraperitoneal and intrathoracic surgery
Orthopaedic surgery
Prostate surgery

Low Risk (cardiac risk $< 1\%$)

Endoscopic procedures
Ambulatory procedures

Preoperative Cardiac Evaluation Algorithm

Need for emergency surgery----->Yes----->Proceed with close monitoring

No

Any high risk factors----->Yes----->Cancel surgery, evaluate and treat

No

Low risk surgery----->Yes----->Proceed with planned surgery

No

Good functional capacity----->Yes----->Proceed with planned surgery
(Met level ≥ 4)

No or Unknown

Measure other risk factors

≥ 3 risk factors

Vascular surgery

Consider testing If it
will change management
Consider perioperative
beta blockers

Intermediate risk surgery

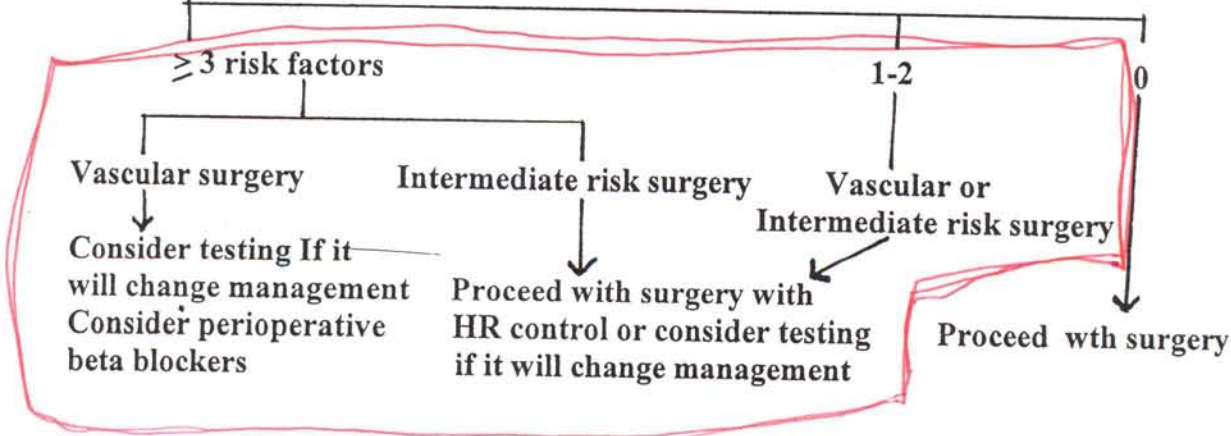
Proceed with surgery with
HR control or consider testing
if it will change management

1-2

Vascular or
Intermediate risk surgery

Proceed with surgery

0



Revised Cardiac Risk Index (RCRI)

-continue B-blockers, nitrates + CCBs
+ the AM of surgery
-D/C ACEIs / ARBs
+ the AM of surgery

1. High risk surgical procedure (Intraperitoneal, intrathoracic, or suprainguinal vascular surgery)
2. History of Ischemic heart disease (H/O MI or a positive stress test, current chest pain considered to be secondary to myocardial ischemia, use of nitrate therapy, Q waves on EKG, do not count prior revascularization procedure unless one of the other criteria for ischemic heart disease is present.)
3. History of heart failure
4. History of cerebrovascular disease (TIA, CVA)
5. Diabetes requiring Insulin therapy
6. Chronic renal insufficiency, baseline Cr > 2.0 mg/dl

Statins
- start prior to vascular surgery

Beta blockers if RCRI score ≥ 2

↳ ideally start 30 days prior to surgery → may D/C 7-10 days post-op
Goal HR: ~60-65

Pre-op CXR
① Age > 60
② Pulm Dis.
③ H-Dis.

Post Operative Pulmonary Complications

Risk factors

Upper abdominal, thoracic and abdominal aneurysm surgery (Risk is less with laproscopic or thoracoscopic procedure)
Surgery lasting > 3Hrs, poor general health status, poor exercise tolerance
COPD, smoking H/O in the past 8 weeks
Use of pancuronium as a neuromuscular blocker

Probable Risk Factors

General anesthesia, emergency surgery, PCO2 > 45 mm

Possible Risk Factors

Current upper respiratory tract infection
Abnormal chest X-ray, Age > 70 yrs

Preoperative Evaluation

Chest X-ray > 60 yrs or if cardiac or pulmonary disease suggested by clinical examination. PFT'S for patients with unexplained cough, dyspnea, exercise intolerance, prior to lung resection and for those with COPD and asthma when clinical examination can not determine that the air-flow obstruction has been optimally reduced.
No role of preoperative blood gases

Strategies to Reduce Complications

Smoking cessation for 8 weeks
Inhaled ipratropium for all patients with clinically significant COPD
Inhaled B agonist for patients with COPD or asthma who have wheezing or dyspnea
Preoperative steroids for COPD or asthma who are not optimized to best baseline and whose airway obstruction has not been maximally reduced
Antibiotics for infected sputum and delay surgery if infection is present
Minimize duration of anesthesia
Epidural or spinal anesthesia in lieu of general anesthesia
Avoid use of Pancuronium as a muscle relaxant
Deep breathing exercises or incentive spirometry in high risk patients
Epidural analgesia in lieu of parenteral narcotics, intercostals nerve blocks

High-Risk
① PFT's

Role for ARBs

DVT Prophylaxis in Surgery

Risk Factors

- Age > 40
- Immobilization
- Obesity
- Varicose veins
- Anesthesia > 30 minutes
- Malignancy
- CHF
- Paralysis
- Previous DVT or PE
- Estrogen use
- Hypercoagulable state

Age < 40 & no other risk factors
General Surgery

- Orthopedic surgery
- Multiple risk factors
- Neurosurgery
- Medical conditions

RX

- Early ambulation
- S/C low dose heparin (LDH) or Low molecular wt. heparin (LMWH) or Intermittent pneumatic compression (IPC)
- LMWH or fondaparinux or warfarin (INR 2-3) - start day after surgery
- LDH or LMWH + IPC
- IPC + graduated compression stockings → ↓ anti-coags
- LDH or LMWH

LMWH is superior to low-dose unfractionated heparin in orthopedic surgery, acute spinal injury & multiple traumas

Eating Disorders

Anorexia nervosa Bulimia

Method of wt. control	↓↓ intake	Vomiting, laxatives
Weight	↓↓ reduced	Near normal
Binge Eating	Uncommon	Common
Ritualized exercise	Usual	Rare
↓HR, ↓BP	Common	Uncommon
Medical complications	↓K, arrhythmia	↓K, arrhythmia, Aspiration, esophagitis, esophageal rupture, dental caries, parotid enlargement, calluses over knuckles, erosion of dental enamel

→ most common cause of metabolic alkalosis in young females

- osteopenia
↑ bone resorption w/ ↓ formation
Psycho-tx

SSRI's
Psycho-tx

Vitamin Toxicity

Hypervitaminosis A

- Acute: Vomiting, abd pain, dizziness, papilledema, generalized desquamation of skin
- Chronic: Bone & joint pains, hyperostosis, ↑Ca pruritus, intracranial hypertension, hair loss, fever, hepatosplenomegaly

abnormal bone growth

Hypervitaminosis D

Hypercalcemia, hyperphosphatemia

Pyridoxine

Peripheral neuropathy, ataxia

Niacin

Flushing, pruritus, hyperuricemia, hyperglycemia, hepatomegaly, ↑LFT'S

Pyridoxine Defic.

- pins/needles sensation in LES
- assoc. w/ INH tx.

SSRI's → ↑d bleeding post-op

stop 1 week pre-op

P/C Tamoxifen + raloxifene ↓ procoagulant

Ginkgo Biloba ↓

↑d bleeding D/C prior to surgery

THR length of DVT prophylaxis 4-6 wks. (even if ambulatory)

Pre-op Abx

- Kefzol thr pre-op cangine a 2nd-dose if procedure is > 3 hrs.

Zinc Defic.

- hyperkeratotic rash
- alopecia
- ↓ taste sensation
- assoc. w/ TPN

Vit. E Defic.

- ataxia
- areflexia
- hemolysis

Vit. A Defic.

- night blindness

Vit. K Defic.

- ↑ bleeding

Vit. D Defic

- hypocalcemia

Vit. C Defic (Scurvy)

- gumbleeding
- ecchymoses
- perifollicular hemorrhages
- normal coags/plats

all also assoc. w/ biliary obstruction

(vit. B6)

Risk Factors for CHD

Major Risk Factors (modify LDL goals)

1. High LDL cholesterol
2. Males ≥ 45 year; Females ≥ 55 years
3. Family history of premature CHD
(Male first degree relative < 55 or F < 65 years)
4. Smoking
5. Hypertension (BP $\geq 140/90$ or on Rx)
6. Low HDL cholesterol (< 40 mg/dL)

Other Risk Factors: \uparrow Homocysteine, \uparrow Lpa, \uparrow CRP

Negative Risk Factor for CHD

High HDL cholesterol (> 60 mg/dL)

*Diet rich in fruits + veggies
↓
Statistically proven
↓ risk of CVD*

*↓ Homocysteine
Folate, vit. B6, vit. B12*

*✓ Inpt's w/ premature vasc. dis
Get to target LDL goals
than Niacin*

*↑ HDL: - statins
- Smoking cessation
- EtOH (moderation)
- ↓ Trig*

*↓ CRP → statins
EtOH (moderation)*

Coronary Heart Disease Equivalents

1. Other Clinical forms of atherosclerotic disease
(PVD, abdominal aortic aneurysm, symptomatic carotid artery disease)
2. Diabetes
3. Multiple risk factors that confer a 10-year risk of CHD $> 20\%$ by Framingham risk scoring

Risk factors used in Framingham risk scoring are age, total cholesterol, HDL, BP, Cigarette smoking

Very High Risk Group

- Established coronary heart disease plus
- Multiple major risk factors (especially diabetes)
- or
- Severe and poorly controlled risk factors (especially continued smoking)
- or
- Multiple risk factors of the metabolic syndrome (especially TG ≥ 200 plus non-HDL-C ≥ 130 plus HDL-C < 40)
- or
- Acute coronary syndrome

Goal of LDL cholesterol < 70 mg/dL and drug therapy should be started if levels are ≥ 70 mg/dL

Metabolic Syndrome

Diagnosis is made if 3 or $>$ of the following risk factors are present

1. Obesity (Waist M > 102 Cm (40 inches); F > 88 cm (35 inches))
2. TG ≥ 150 mg/dL
3. HDL in M < 40 mg/dL or in F < 50 mg/dL
4. BP $\geq 130/85$
5. FBS ≥ 110 mg/dl

Treatment: Weight control and exercise

Framingham Risk Scoring

Table B1. Estimate of 10-Year Risk for Men (Framingham Point Scores)

Age, y	Points
20-34	-9
35-39	-4
40-44	0
45-49	3
50-54	6
55-59	8
60-64	10
65-69	11
70-74	12
75-79	13

Total Cholesterol, mg/dL	Points				
	Age 20-39 y	Age 40-49 y	Age 50-59 y	Age 60-69 y	Age 70-79 y
<160	0	0	0	0	0
160-199	4	3	2	1	0
200-239	7	5	3	1	0
240-279	9	6	4	2	1
≥280	11	8	5	3	1

Nonsmoker Smoker	Points				
	Age 20-39 y	Age 40-49 y	Age 50-59 y	Age 60-69 y	Age 70-79 y
Nonsmoker	0	0	0	0	0
Smoker	8	5	3	1	1

HDL, mg/dL	Points
≥60	-1
50-59	0
40-49	1
<40	2

Systolic BP, mm Hg	Points	
	If Untreated	If Treated
<120	0	0
120-129	0	1
130-139	1	2
140-159	1	2
≥160	2	3

Point Total	10-Year Risk, %
<0	<1
0	1
1	1
2	1
3	1
4	1
5	2
6	2
7	3
8	4
9	5
10	6
11	8
12	10
13	12
14	16
15	20
16	25
≥17	≥30

Table B2. Estimate of 10-Year Risk for Women (Framingham Point Scores)

Age, y	Points
20-34	-7
35-39	-3
40-44	0
45-49	3
50-54	6
55-59	8
60-64	10
65-69	12
70-74	14
75-79	16

Total Cholesterol, mg/dL	Points				
	Age 20-39 y	Age 40-49 y	Age 50-59 y	Age 60-69 y	Age 70-79 y
<160	0	0	0	0	0
160-199	4	3	2	1	1
200-239	8	6	4	2	1
240-279	11	8	5	3	2
≥280	13	10	7	4	2

Nonsmoker Smoker	Points				
	Age 20-39 y	Age 40-49 y	Age 50-59 y	Age 60-69 y	Age 70-79 y
Nonsmoker	0	0	0	0	0
Smoker	9	7	4	2	1

HDL, mg/dL	Points
≥60	-1
50-59	0
40-49	1
<40	2

Systolic BP, mm Hg	Points	
	If Untreated	If Treated
<120	0	0
120-129	1	3
130-139	2	4
140-159	3	5
≥160	4	6

Point Total	10-Year Risk, %
<9	<1
9	1
10	1
11	1
12	1
13	2
14	2
15	3
16	4
17	5
18	6
19	8
20	11
21	14
22	17
23	22
24	27
≥25	≥30

Treatment of Hyperlipidemia

Treatment decisions are based upon LDL levels

$$LDL = Chol - (TG/5 + HDL)$$

TLC
Therapeutic
Lifestyle
Changes

	TLC	Drug Therapy	LDL Goal	Non-HDL Cholesterol goal (If TG > 200 mg/dl)
0-1 Risk Factors	≥ 160 (3 months)	≥ 190 (Optional 160-189)	< 160	< 190
2 or > Risk Factors	≥ 130 (3 months)	≥ 160 (10 year risk < 10%) ≥ 130 (10 year risk 10-20%) 100-129 (optional)	< 130 < 100 is an option	< 160
CHD or CHD Equivalents	≥ 100	≥ 100	< 100	< 130
Very High Risk	≥ 70	≥ 70	< 70	< 100

φ trials of diet + exercise

Therapeutic Life Style Changes (TLC)

Diet

Cholesterol	< 200 mg/d
Total fat	25-35% of total calories
Polyunsaturated fat	Upto 10% of total calories
Monounsaturated fat	Upto 20% of total calories
Saturated fat	< 7% of total calories
Carbohydrates	50-60% of total calories
Proteins	15% of total calories
Fiber	20-30 g/d
Total calories	To maintain desirable body weight

of benefits of :
vit. A, B, C, E or
β-carotene

If after 6 weeks LDL goal not reached, add plant stanol/sterols

Exercise

Weight control

Factors which ↑ Trig

- obesity
- Tobacco
- EtOH

Drug Therapy of Hyperlipidemia

Drugs of choice

1. ↑ LDL + TG < 200
 2. ↑ LDL + TG 200-400
 3. ↑ LDL + TG > 400
 4. N LDL + TG > 500
 5. N LDL + TG > 200
 6. N LDL + ↓ HDL + TG N
- Statin, bile acid sequestrant, niacin, ezetimide
Statin, niacin, fibrates
Statin, niacin, fibrates
(consider combination therapy)
Fibrates, niacin, omega-3 fatty acids
Treat to achieve non HDL cholesterol goal
Treat only if CHD or CHD equivalents present

Side Effects of Drugs for Lipids

Statin

Myalgia, myositis, rhabdomyolysis, elevated liver enzymes, polyneuropathy, memory loss, SLE, pancreatitis
Increased risk of myositis when statins are used with fibrates, erythromycin, azole antifungal drugs, niacin, clarithromycin, nefazodone, grape fruit juice, cyclosporine and ezetimide

stop statin even w/ normal ck's + try another statin

Fibric Acid Derivatives

Cholelithiasis, hepatitis, myositis, potentiates effect of oral anticoagulants and hypoglycemic agents

Niacin

Flushing, ↑ glucose, ↑ uric acid, hepatic toxicity, exacerbation of peptic ulcers

Ezetimibe

Diarrhea, arthralgia, myalgia, rhabdomyolysis, hepatitis, thrombocytopenia

Bile Acid Sequestrants

Constipation, bloating, heartburn

Factors That Increase Triglycerides

- 1. Obesity
- 2. Smoking
- 3. ↑ Alcohol intake
- 4. ↑ Carbohydrates
- 5. Diabetes
- 6. CRF
- 7. Nephrotic syndrome
- 8. Genetic: Familial combined hyperlipidemia
- 9. Drugs: Steroids, estrogen, retinoids, beta-blockers

Treatment

- 1. Weight reduction
- 2. Low fat diet
- 3. Low carbohydrates diet
- 4. Exercise
- 5. Niacin or fibrates

Risks From Smoking

Benefits of Smoking Cessation
 ↓ CAD risk by 50% in 4 yr.
 10-yr. risk of lung ca. by 10-50%

Cardiovascular diseases
 cancers: Lung, head and neck, pancreas, stomach
 Respiratory diseases
 Pregnancy: Low birth weight, premature delivery
 Effect on lipids: ↑ LDL, ↓ HDL, ↑ TG
 Increases risk of invasive pneumococcal disease → give Pneumovax

Treatment of Dependence:

- Nicotine replacement: Patch, gum, nicotrol inhaler, nasal spray, S/L tablet
- Non-nicotine therapy: Sustained release bupropion, Counseling
- Hypnosis and acupuncture

Chantix

side effect
 - suicidal thoughts
 - regressive behavior
 - nausea

ALLHAT TRIAL

Thiazides type diuretics such as chlorthalidone are superior to ACE inhibitors or calcium blockers in preventing major CVD events. They are also less expensive. Therefore thiazides should be the preferred first-line therapy for hypertension. If blood pressure control is inadequate after first-line treatment with another agent, a thiazide should be the preferred second agent.

JAMA 2002: 288-2981-2997

JNC VII Report Summary

Definitions:

- Normal BP: < 120/80
- Stage I hypertension: 140-159/90-99
- Prehypertension: 120-139/80-89
- Stage II hypertension: ≥160/≥100

Summary:

- 1. In persons > 50 yrs systolic BP > 140 is much more important risk factor for cardio-vascular disease (CVD) than diastolic BP.
- 2. The risk of CVD starts at 115/75 and doubles with each increment of 20/10 mm
- 3. Persons who are normotensive at age 55 have a 90% lifetime risk for developing elevated BP.
- 4. Thiazides type diuretics should be used in drug treatment for most patients with uncomplicated hypertension either alone or combination with drugs from other classes unless compelling reasons to use other drugs are present.
- 5. If BP is more than 20/10 mm above goal BP, considerations should be given starting therapy with 2 drugs one of which should be a thiazide diuretic.
- 6. Goal BP: < 140/90, < 130/80 for patients with diabetes or kidney disease

Management of Hypertension

Life-Style Modification

1. Weight reduction (BMI 18.5-24.9)
2. Regular aerobic exercise (30-45 minutes daily)
3. Limit alcohol intake (30 ml ethanol /day for men & 15 ml / day for women)
4. Reduce Na intake (2.4 g of Na or 6 g of NaCl / day)
5. Adequate intake of Ca, K & Mg
6. Quit smoking
7. The "Dash" diet of fresh fruits, vegetables, low fat dairy products, whole grain, poultry and fish

Drug Therapy for Hypertension

Indications

1. Initial BP > 160/100 OR > 130/85 with diabetes or target organ damage (LVH, renal insufficiency, vascular disease, retinopathy)
2. With life style modification for 6-12 months, BP remains > 140/90 (6 months if CHD risk factors +, 12 months if no risk factors)

Drugs

Thiazide type diuretics as initial agents either alone or combination with drugs from other classes unless compelling reasons to use other drugs are present

Diabetes	ACE inhibitors or ARBs
CHF, LVH, azotemia, vascular disease	ACE inhibitors or ARBs
MI	B-Blockers (Non-ISA)
MI + systolic dysfunction	ACE inhibitors
Isolated systolic hypertension	Diuretics or long acting dihydropyridine
BPH	Alpha-1 receptor blockers
Essential tremor	B-blockers

non-intrinsic sympathomimetic activity

Best to prevent CVA
HCTZ
(than ACEI's or CCB's)
even in AAs.

Hope Trial

Ramipril reduces the the risk of MI, Stroke or death from cardiovascular disease in patients with known vascular disease (CAD, PVD, Stroke) or Diabetes

+

One additional risk factor

↑BP, ↑cholesterol, ↓HDL, smoking or microalbuminuria

Benefits of Regular Exercise

→ 30 minutes of moderately vigorous exercise daily

1. ↓ LDL, ↓ TG & ↑ HDL
3. Protects against exertional related heart attacks
5. Improves glucose metabolism
7. Reduces stress
9. Reduces Death rate from all causes
11. ↓ risk of osteoporosis
2. Protects against CHD
4. Reduces body weight
6. Reduces BP
8. ↓ insulin resistance
10. ↓ risk of breast cancer
12. ↑ stroke volume in CHF

Coronary Heart Disease In Women

Leading cause of death
Usually Occurs 10-20 years later as compared to men
Rare in young women
Less likely to be treated aggressively
Mortality is higher
Women are less likely to be included in clinical trials

Postmenopausal Hormone Replacement Therapy

→ ⌀ used as much due to adverse CVD disease event rates

↑ HDL, ↓ LDL, ↓ Lp(a), inhibit oxidation of LDL
↑ TG, ↑ factor VIII, prothrombin and fibrinopeptide A

Benefits

1. Improves symptoms of menopause
2. ↑ bone density
3. ↓ risk of colon cancer
4. No benefit for primary or secondary prevention of CHD.

Risks

1. Endometrial cancer
2. Venous thromboembolism
3. Breast cancer
4. Gall bladder disease
5. ↑ risk of stroke and coronary events

↑ dependence if pt's become symptomatic off HRT

Contraindications for Hormonal Replacement Therapy

Absolute

Pregnancy
Unexplained vaginal Bleeding
Active or chronic liver disease
Recent vascular thrombosis
H/O breast or endometrial cancer
Known CHD

Relative

H/O thromboembolic disease
Hypertriglyceridemia
Family H/O breast cancer
Uterine leiomyoma
Gall bladder disease
Migraine headaches
Seizure disorder

Menopausal
Alternative
Black Cohosh
- mechanism unknown
- may ↓ hot flashes
- use for 4-6 months
- side effects:
- N/V
- dizziness
- HAs

Aspirin for Primary Prevention of CAD

Indications:

Intermediate to high risk patients with 10 year risk of cardiovascular events > 15 % by Framingham risk score
 Probable use if risk 10-15%. The decision left to patient after careful discussion of risk and benefit
 All diabetic patients > 40 yrs with one or more cardiovascular risk factors or those with known vascular disease.

Dose:

Low dose < 100 mg are safer and as effective as higher doses. Clopidogrel should be used in those who are allergic to aspirin or intolerant of aspirin

Primary Prevention Of CHD

Intervention	CHD Risk	Effect on Mortality
1. Smoking cessation	50% reduction	Yes
2. Hypertension Rx	<u>20-25% reduction</u> with 5 mm drop in BP	Yes
3. LDL reduction	1% reduction for each 1% decline	Yes
4. Aspirin	40% reduction	No → ϕ effect on mortality
5. Exercise	20-40% reduction	YES
6. Alcohol (in moderation)	20-45% reduction	?

Prevention of Cancer

1. No smoking
2. Exercise regularly
3. Avoid obesity
4. Reduce saturated fat intake
5. Aspirin qd
6. Avoid excessive alcohol intake
7. Selenium (200 ug qd)
8. Avoid sunburn & use sunscreens
9. Hepatitis B vaccine

Complications of Obesity

Increase risk of CAD, BP and sudden death
 \uparrow LDL, \downarrow HDL, \uparrow TG
 Type II diabetes, insulin resistance
Cancer of endometrium, breast, prostate & colon
 Gall stones, osteoarthritis

Treatment of Obesity

$$BMI = \frac{wt(kg)}{Ht(m)^2}$$

Normal 18.5 - 24.9
 Overweight 25.0 - 29.9
 Obese ≥ 30

Class I 30 - 34.9
 Class II 35 - 39.9
 Class III ≥ 40

1. Diet and exercise

(Every kg of weight loss produces a 16% reduction in diabetes risk)

2. Drugs (BMI > 30 or > 35 + obesity related co-morbidities)

Orlistat (xenical) → prevents fat absorption (side effect → malabsorption)

appetite suppressant

Sibutramine (meridian) → nonadrenergic/adrenergic action - can ↑ BP's → Lisin H/TN

Sympathomimetics amines (phentermine, benzphetamine and others)

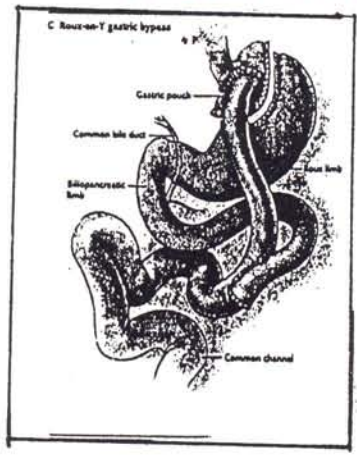
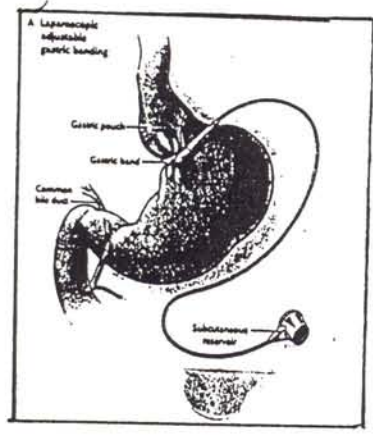
- insomnia
 - dry mouth

3. Surgery (BMI > 40, or BMI > 35 + obesity related co-morbidities)

FDA approved

Adjustable gastric band inserted laproscopically

Roux-EN-Y gastric bypass → induced malabsorption



Mirtazapine : ↑ weight gain
 ↑ appetite

Indications for Influenza Vaccination

1. Adults & children with chronic diseases
2. Residents of NH & other chronic care facilities
3. Persons > 50 years old
4. Health care personnel
5. HIV+ patients
6. Children who require long term aspirin therapy
7. Household contacts of high-risk persons
8. Employees of residences for people at high risk
9. Providers of home care to high risk individuals
10. Pregnant women
11. Any one who wishes to be vaccinated

rate of admissions for pneumonia in elderly
 ↓ stroke incidence
 ↓ overall mortality by 48-50%

H4 flu epidemic
 antivirals to all residents regardless of vaccination status

A → Amantadine
 B → Tamiflu

Antiviral drugs for the prevention and treatment of Influenza

Amantadine, Rimantadine, Zanamivir, Oseltamivir

Indications for Pneumococcal Vaccine

Revaccinate in 5 yrs.
 - Immunosuppressed
 - Asplenic
 - < 65 y.o. @
 first dose

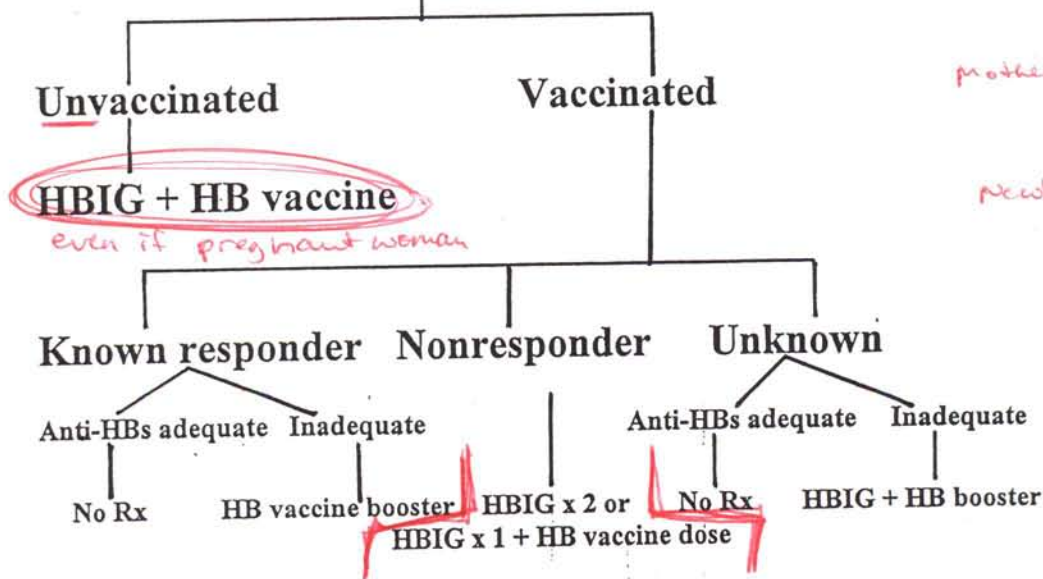
1. Age > 65 years
2. Chronic heart and lung disease
3. Asplenia or splenic dysfunction, sickle cell
4. Diabetes, alcoholism, cirrhosis, CSF leaks
5. Hodgkin's, myeloma, cancer chemotherapy
6. Immunosuppression, HIV infection
7. Renal failure & nephrotic syndrome
8. Residents of nursing home and other long-term-care facilities
9. Post organ or bone marrow transplant

Indications for Hepatitis B Vaccine

1. Health care workers
2. Residents of facilities for handicapped
3. Hemodialysis patients
4. IV Drug users
5. Sexually active homosexual and bisexual men
6. Household and sexual contacts of HBV carriers → needed for household contacts of acute Hep B
7. Heterosexual with multiple partners
8. Inmates of correctional facilities
9. Patients requiring long term use of plasma derivatives
10. Infants born to HBsAg positive mothers

Exposure to HBsAg + Blood

(Needlestick or mucous membrane)



Indications For Hepatitis A Vaccine

1. Prior to travel to developing countries
2. Chronic liver disease
3. Homosexual men
4. Lab workers handling HAV
5. IV drug users

Post-Exposure Prophylaxis

- gamma globulin
w/in 2 wks. of
exposure

Indications for Varicella Vaccine

(live vaccine)
↓
contraindicated
in pregnancy

2-dose series
over 6 wks.

Susceptible adults in the following categories

1. Health care workers
2. Household contacts of immunosuppressed
3. Nonpregnant women of child bearing age
4. Working in schools or day care centers
5. College students & those in military
6. International travelers
7. Other susceptible adolescents or adults

+ evidence of
immunity

Other Vaccinations

post-exposure
vaccine w/in 72 hrs

Tetanus & Diphtheria - @ 10 yrs.

Polio - live oral polio to immunocompromised or their families
↳ IM version instead

Measles { Born after 1956+ who have not rec'd 2 doses (1 month apart)
↳ live vaccine → Ig to immunocompromised

Rubella

Mumps

H. influenzae type b → splenectomy or HIV pts.

Travel Related

Typhoid, Yellow fever, Japanese encephalitis

Meningococcal, Rabies, Plaque, Malaria prophylaxis

↓
post-exposure
IG + vaccine

women of
child bearing age
↓
pregnancy x 1
month after
vaccine

Malaria Prophylaxis

Travelling to areas with no chloroquin resistance

(Central America, Haiti, Mexico, Dominican Republic, Egypt, Paraguay, northern Argentina, Korea, Georgia, Armenia, most rural china and some countries in the Middle East)

Chloroquin 300 mg base weekly starting 1 week before & 4 weeks after

Travelling to areas with Chloroquin resistance

Drug of Choice:

Atovaquone + Proguanil (Malarone) 1 tablet starting 1-2d before travel and stop 1 week after leaving malarious zone

or

Mefloquin 250 mg weekly starting 1 week before & 4 weeks after

or

Doxycycline 100mg daily starting 1-2 days before & 4 weeks after

Alternative:

Primaquine phosphate 30 mg daily starting 1d before and 7d after

↳ Do G6PD testing prior to giving

avoid in seizure D/O's

↳ dizziness
↳ insomnia

Injuries

Leading cause of death in < 30 yrs. old

Auto accidents

Bicycle & motorcycle accidents

Fire arms

Fires & scalding

Drowning

Domestic violence

Falls

Clinical Findings Suggestive of Domestic Violence

1. Injury to head, neck, torso, breasts, abdomen, or genitals
2. Bilateral or multiple injuries with different healing time
3. Burns, knife wounds or any injury to pregnant woman
4. Chronic pain symptoms with no apparent etiology
5. Depression, suicidal ideation, anxiety or sleep disorder
6. A partner who seems overly protective or who will not leave woman's side

Vaccinations in Pregnancy

- cannot give live vaccines:

MMR

varicella

oral polio

yellow fever

- IG's are safe

Zostavax

- live vaccine

- Ages > 60 yrs

- x1 dose

- pt's who never had

Zoster

~~zoster~~

HPV vaccine

- Females 9-26 yrs

C-spine Injury
5 factors to r/o serious C-spine injury
① midline cervical tenderness or papillo
② focal neuro deficits
③ normal alertness
④ lack of intoxication
⑤ painful distracting injuries
↓
49,870 NPV
validated by NEXUS
If any is positive
↓
imaging indicated (ET preferred)

How to Stay Happy & Healthy

1. Consume a proper diet

Limit total calories to maintain desirable weight (BMI 21-25 kg/m²)
 Total Cholesterol intake <300 mg/d, total fat 20-35% of total calories, saturated fat < 10% total calories, with most fats coming from sources of polyunsaturated and monounsaturated fatty acids like fish, nuts and vegetable oils (olive, canola, peanut, soybean, sunflower, safflower and corn oil), and salt < 2300 mg of sodium/d (1 teaspoon of salt/d).

Keep Trans fatty acids (partially hydrogenated vegetable oil/shortening) consumption as low as possible and consume more fiber.

Reduce intake of red meat, egg yolk, fried foods, added sugars, and consume more fish (12 ounces/week), poultry, fruits (2 cups/d), vegetables (2 1/2 cups/d) and whole-grain products (3 or more ounce/d).

Choose a variety of fruits and vegetables each day. In particular select from all five vegetable subgroups (dark green, orange, legumes, starchy vegetables, and other vegetables).

When selecting and preparing meat, poultry, dry beans, and milk and meat products, make choices that are lean, low-fat, or fat free

Consume 3 cups/d of fat-free or low-fat milk or equivalent milk products

Safest fish: Flounder, farmed rainbow trout, sole, anchovies, and farmed clams and shrimp (low in mercury and PCB). Other fish are fine to eat in moderation—once a week—such as cod, farmed cat fish, mahi mahi, wild salmon, tilapia, and canned chunk tuna. Do not eat shark, swordfish, king mackerel, or tile fish (contain high levels of mercury). The highest levels of PCB are found in farmed salmon and fish caught in local lakes and ponds.

*Diets rich in
fruits/vegetables
↓
statistically
proven to
reduce risk
of CVD*

*Polychlorinated
Biphenyls
(PCBs)*

Other sources of Omega 3 fatty acids

Flaxseed, canola, soybeans, walnuts, and fish oil capsules

2. Vitamins

Multivitamin tablet daily for all adults

Folic acid (.4mg/d) for young women planning to become pregnant

Vitamin B12 for older adults

Vitamin D for older adults, postmenopausal women, people with dark skin, and people exposed to insufficient sun light

Calcium supplements for postmenopausal women and elderly

No benefit from vitamin A, vitamin C, vitamin E or beta carotene

3. Quit Smoking

4. Exercise regularly

30 minutes of moderate-intensity physical activity daily

60 minutes daily to prevent weight gain

60-90 minutes daily to sustain weight loss

Achieve physical fitness by including cardiovascular conditioning, stretching exercises for flexibility, and resistance exercises or calisthenics for muscle strength and endurance

*You must consult your physician before starting an exercise program

5. Alcohol

Alcohol intake not to exceed two drinks/day for men and one drink/d for women & do not drive after drinking

Alcohol should not be consumed by pregnant and lactating women, children and adolescents, individuals taking medications that can interact with alcohol and those engaging in activities that require attention, skill, or coordination, such as driving or operating machinery

6. Wear seat belts while driving a car & helmets while driving a bicycle

7. Avoid stress and learn new ways to cope with stress (yoga and meditation)

8. Get proper sleep (6-7 hours a day)

9. Preventive health care

Be up-to-date with all preventive vaccinations and prior traveling to developing countries take all travel related vaccinations.

Influenza vaccine: Annual for persons > 50 yrs, adults and children with chronic diseases

Pneumonia vaccine: Once for persons > 65 yrs, persons < 65 yrs with chronic medical conditions

Prostate cancer screening: Annual PSA and digital rectal examination in men 50-79 yrs old. Start screening at age 45 yrs in blacks or family history

Pap smear: Annual

Mammography: Every 2-3 yrs after age 40 and annual after age 50

Colon cancer screening: Begin at age 50, Fecal occult blood testing annually and sigmoidoscopy every 3-5 yrs or colonoscopy every 10 yrs

10. Practice safe sex

11. Check your cholesterol & BP and take appropriate actions if elevated.

12. Aspirin daily for those with coronary heart disease or multiple risk factors for coronary heart disease

13. Install smoke detectors, fence pools, keep water heater at <50 degree centigrade and do not keep fire arms at home

14. Be an optimist:

Pessimistic explanation style is associated with increased death rate

15. Faith in God

16. Finally to stay happy and healthy, you should be honest, control your anger, love your family, help others in need and your conduct towards all should be guided by love, righteousness and justice

Medical Ethics

1. Mentally competent patient has a right to consenting to or refusing a treatment.
2. When patient is incompetent, decisions should be guided by :
 - a. Living will
 - b. Durable power of attorney for health care (HCP)
 - c. Caring family may express patient's values and interests
 - d. Court appointed guardian
 - e. Informed consent not required for emergency care
3. The same reasons that justify not starting the treatment also justify stopping the treatment.

Surrogate (Proxy)

1. Can consent to or withdraw any type of care including nutritional support
2. Has priority over any other decision makers
3. Can make only health care decisions
4. Can overrule the living will document
5. Review medical records of patient

Ex.) Pt is intubated
 → emergently then his family produces a living will which states he would not want intubation
 ↓
 extubate the patient

Ex.) 80 yo man w/ living will stating no life-sustaining interventions for terminal illness now w/ acute resp distress + wants intubation
 ↓
 Intubates Tx

End of Life Decisions

1. Competent patient can refuse any life sustaining treatment including nutritional support.
2. "DNR" orders can be written when patient or surrogate requests them.
3. Physician can also write " DNR " orders if CPR will be futile.
4. If "DNR" orders are not written, it is unethical to perform half hearted efforts ("Slow Codes").
5. Narcotics and sedatives may be used to relieve pain or dyspnea in terminally ill patients.

Other Ethical Issues

Brain Death

- comatose
- unresponsive
- corneal / gag reflex absent
- apnea test → if spontaneous respirations
- if on sedatives then must D/C them/reverse them
- does not require an EEG

- Financial incentives in managed care
- Gifts from pharmaceutical companies
- Misrepresenting patient condition
- Unethical behavior by colleagues
- Active euthanasia
- Dumping → denial of care based on insurance / economical reasons
- Confidentiality

Hospice Care

→ pursue if expected life course < 6 months

Interpretation of Diagnostic Tests

		Disease		
		Present (+)	Absent(-)	
Test	Test (+)	True +ve (a)	False +ve (b)	→ ppr (a/a+b)
	Test (-)	False -ve (c)	True -ve (d)	→ npr (d/c+d)
	Total Pt's	Disease present sensitivity (a/a+c)	Disease absent specificity (d/b+d)	

Prevalence: Proportion of patients who have the disease in the entire population

Sensitivity: Likelihood of a positive test in the patient with the disease = $a/a+c$

Specificity: Likelihood of negative test in the patient without the disease = $d/b+d$

Positive predictive value: Chances that a positive test indicates the disease = $a/a+b$

Negative predictive value: Chances that a negative test rules out the disease = $d/c+d$

Post-test probability of having the disease

When the test is positive = Positive predictive value %

When the test is negative = 100 - Negative predictive value %

Prevalence 20% Test sensitivity 95% Specificity 90%

	Disease		
	Present(+)		Absent(-)
Test (+)	19 <i>a</i>	8 <i>b</i>	
Test (-)	1 <i>c</i>	72 <i>d</i>	
Total(100)	20		80

Positive predictive value = $19/27 = .7$ or 70%

Negative predictive value = $72/73 = .99$ or 99%

Post-test probability of disease when test is positive = 70%

Post-test probability of disease when test is negative = $100 - 99 = 1\%$

	Disease		
	+	-	
Test+	10	40	<i>PPV = 10/50 = 20%</i>
Test -	10	40	<i>NPV = 40/50 = 80%</i>
Total(100)	20	80	

Positive predictive value = $10/50 = .2$ or 20 %

Negative predictive value = $40/50 = .80$ or 80 %

Disease

	+	-
Test+	40	10
Test -	10	40
Total(100)	50	50

$$PPV = \frac{40}{50} = 80\%$$

$$NPV = \frac{40}{50} = 80\%$$

Positive predictive value = $40/50 = .80$ or 80 %

Negative predictive value = $40/50 = .80$ or 80 %

Post-test probability of disease when test is positive = 80%

Post-test probability of disease when test is negative = $100 - 80 = 20\%$
(1 - NPV)

Prior Odds:

The chance that a disease is present before a screening test is performed = Prevalence/1-prevalence

Likelihood Ratios (LR): This helps to avoid the prevalence bias

Positive likelihood ratios (LR+):

Defines the odds of having the condition if the test result is positive = Sensitivity/1-specificity

Negative likelihood ratios (LR-):

Odds of having the disease if the test result is negative = $1 - \text{Sensitivity} / \text{specificity}$

⊕ LR of 2 → ↑d prob by 15%
⊕ LR of 5 → ↑d prob by 30%
⊕ LR of 10 → ↑d prob by 45%

Odds of condition being present given a positive test

(post-test odds) = Prior odds x LR +

Post-test probability when the test is positive = Post-test odds / (1 + post-test odds)

Odds of condition being present given a negative test

(post-test odds) = Prior odds x LR-

Post-test probability when the test is negative = Post-test odds / (1 + post-test odds)

Number needed to treat: $1 / \text{absolute risk reduction}$ (the absolute adverse event rate for placebo - adverse event rate for treated patient)

$$\frac{1}{ARR} = \frac{100}{RR(\%)}$$

↓
risk reduction

$$\frac{100}{20\%} = 5$$

Example: Prevalence of the disease is 7%. The test sensitivity is 80% and the specificity is 80%

$$\text{Prior odds} = .07 / (1 - .07) = .07 / .93 = .075$$

$$LR+ = .8 / (1 - .8) = .8 / .2 = 4$$

$$LR- = 1 - .8 / .8 = .2 / .8 = .25$$

$$\text{Post-test odds when the test is positive} = .075 \times 4 = .3$$

$$\text{Post-test probability when the test is positive} = .3 / (1 + .3) = .3 / 1.3 = .23 = 23\%$$

$$\text{Post-test odds when the test is negative} = .075 \times .25 = .019$$

$$\text{Post-test probability when the test is negative} = .019 / (1 + .019) = .0186 = 1.86\%$$

If prevalence ↑
then PPV also ↑

Mortality on placebo
40%

Mortality on test
20%

Generalized Anxiety Disorders

Symptoms of anxiety can be related to :

Motor tension: Shakiness, trembling, restlessness, fatigue

Autonomic hyperactivity: Palpitation, dyspnea, sweating

Apprehensive expectation: Anxiety, fear

Vigilance: Poor concentration, insomnia, irritability etc.

Treatment

1. Antidepressant anxiolytics

SSRI Venlafaxine XR, Tricyclics (Imipramine, Nortriptyline)

2. Benzodiazepine anxiolytics → short-term only

Clonazepam (Klonopin), Lorazepam (Ativan)

3. Nonbenzodiazepine anxiolytics (Buspirone)

4. Cognitive behavioral therapy

5. Applied relaxation therapy

b/c dependence crises after 2 months of use

Panic Disorder

Episodes of intense fear or discomfort not associated with specific anxiety provoking situation. Symptoms peak in 10 minutes & taper in 60 minutes. Attacks are associated with at least four of the following symptoms.

- | | | |
|-----------------|----------------------|---------------------------|
| 1. Dyspnea | 2. Palpitation | 3. Chest pain |
| 4. Choking | 5. Dizziness/Vertigo | 6. Hot & cold flashes |
| 7. Paresthesias | 8. Sweating | 9. Faintness |
| 10. Trembling | 11. Fear of Dying | 12. Feelings of unreality |

urge Incontinence
↑ d risk w/ nortriptyline + α-blockers

- Incontinence w/ SSRI's → rare

Incontinence Causes:
- intrinsic sphincteric incompetence
↓
usual cause
Tx: 1) Anticholinergics
2) collagen Injex
3) sling procedures
4) Artificial urinary sphincter implantation

Treatment

1. SSRI's
3. Tricyclics

2. Benzodiazepine
3. MAO inhibitors

x1 year after initial response

Unipolar Depression

Dysphoric mood > 2 wks

Plus

At least four of the following symptoms:

- | | |
|---|-----------------------------|
| 1. Weight change | 2. Loss of energy |
| 3. Psychomotor retardation or agitation | 4. Feeling of worthlessness |
| 5. Diminished concentration | 6. Suicidal thoughts |
| 7. Insomnia or hypersomnia | 8. Decreased sexual drive |

Five-Item Geriatric Depression Scale

- out of 5 points
- 3 d/5 → possible depression

Tx: Anti-depressants
6-9 months for 1st attack
subsequent attacks
1-2 years

If > 2 but < 5
↓
Subthreshold Depression
↓
Tx: Close Flw

S
I
G
N
I
F
I
C
A
N
T

Bipolar Disorder

Mania

Euphoria or irritable mood, decreased need for sleep, talkativeness, poor judgment, racing thoughts, increased sexual activity and aggressive activity, increased motor activity or agitation

Tx: Neuroleptics
+ Lithium
↳ best for prophylaxis

Hypomania

Mild episodes without psychotic symptoms, and without symptoms of being dangerous to self or others

Depression

Symptoms same as in unipolar depression

Drugs for Depression and Anxiety

Tricyclics

Amitryptiline (Elavil), imipramine (Tofranil), desipramine (Norpramine), nortriptyline (Pamelor)

* SSRIs (selective serotonin-reuptake inhibitors)

Fluoxetine (Prozac), paroxetine (Paxil), sertraline (Zoloft), citalopram (Celexa), fluvoxamine (Luvox), escitalopram (Lexapro)

urge incontinence
due to anti-cholinergic effects

MAOIs

Phenelzine (Nardil), tranlycypromine (Paranate)

Benzodiazepines

Alprazolam (Xanax), diazepam (Valium), clonazepam (Klonopin), lorazepam (Ativan), oxazepam (Serax)

Others

Bupropion (Wellbutrin-norepinephrine and dopamine reuptake inhibitor)
Venlafaxine (Effexor-serotonin and norepinephrine reuptake inhibitor)
Nefazodone (Serzone-blocks 5 HT₂ and serotonin reuptake)
Mirtazapine (Remeron-blocks alpha₂ adrenergic receptor and 5HT₂ and HT₃)
Trazodone (Desyrel-blocks alpha 1 adrenergic receptor and 5 HT₂)

Side Effects of Antidepressants

Lithium : Muscle twitching & fasciculations, tremors, ataxia, dysarthria, seizures, athetotic movements, hypothyroidism, hypercalcemia, diabetes insipidus, renal failure

Tricyclic : Dry mouth, urinary retention, postural hypotension, sedation, arrhythmia

Trazodone : Priapism, sedation, postural hypotension

MAO inhibitors : Hypertensive crisis after taking tyramine containing foods or sympathomimetic drugs

Benzodiazepines : Sedation, anterograde amnesia, addiction, withdrawal symptoms

SSRIs : Sexual dysfunction, SIADH, extrapyramidal effects

Bupropion : Seizures

↳ does not cause wt. gain
least likely to cause sexual dysfx

Other Psychiatric Disorders

Obsession
persistent intrusive thought

Compulsion
action in response to the
obsession

Tx: Fluoxetine

Somatization disorder → multiple complaints referred to multiple organ systems

Obsessive compulsive disorder

Conversion disorder → unconscious emotional conflict is expressed as a physical ailment

Schizophrenia

Conversion Disorder

Unconscious emotional conflict is expressed as an alteration or loss of physical function usually controlled by voluntary nervous system

usually stress

Schizophrenia

Serious mental illness characterized by hallucinations, delusions and disorganized thoughts & behavior

- false beliefs held w/ conviction

Treatment of Schizophrenia

First-generation antipsychotic agents

Chlorpromazine, perphenazine, trifluoperazine, thiothixene, haloperidol

Second-generation antipsychotic agents

last resort → Clozapine, risperidone, olanzapine, quetiapine, ziprasidone, aripiprazole, amisulpride

Depot preparations (given I/M every 2-4 wk)

Fluphenazine decanoate, haloperidol decanoate, flupentixol decanoate
Risperidone microspheres

Side Effects of Antipsychotics Drugs

First-generation
 Extrapyrimalidal: Dystonia, bradykinesia, tremor, akathisia, tardive dyskinesia
 Others: Sedation, weight gain, hyperprolactinemia, postural hypotension, sunburn, prolonged QT interval, neuroleptic malignant syndrome

Tx: Benztropine or Trihexiphenidyl *restlessness*

Second-generation
 Weight gain, diabetes, hypercholesterolemia, sedation, hypotension, hyperprolactemia (with risperdone)
 Clozapine: Agranulocytosis, myocarditis, seizures, lens opacities

*-hyperthermia
 -rigidity
 -tremors
 Tx: Rapid cooling
 Dantrolene
 Bromocriptine*

Post Traumatic Stress Disorder

Traumatic Event:

The event that has the capacity to provoke fear, helplessness or horror in response to the threat of injury or death (physical or sexual assault, serious accident, natural disaster, combat, being taken hostage, torture, unexpected death of loved one and witnessing a traumatic event)

Symptoms of reexperiencing the event:

Unwanted recollections of the incident in the form of distressing images, nightmares or flashbacks

Symptoms of Avoidance:

Attempts to avoid reminder of the event, including persons, places or even thoughts associated with the incident. Avoids people and places that remind him of the event.

Symptoms of Hyperarousal:

Insomnia, irritability, impaired concentration and hypervigilance

Treatment:

1. Counseling
2. SSRI
3. Nefazodone or venlafaxine
4. Divalproex

↳ zentraline / paroxetine

Serotonin Syndrome

-seen w/ use of more than 1 serotonin agent

S/S: Tremor, tachycardia, hypertension, mydriasis, hyperreflexia, clonus, muscle rigidity, hyperthermia, agitation, delirium and coma

Drugs associated with the serotonin syndrome

- Antidepressant drugs: SSRIs, trazodone, nefazodone, buspirone, clomipramine, venlafaxine, MAO inhibitors and lithium
- Analgesics: Meperidine, fentanyl, tramadol and pentazocine
- Anticonvulsant: Valproate
- Antimigrain drugs: Sumatriptan
- Bariatric medications: Sibutramine
- Antibiotic: Linezolid
- Antiemetic: Ondansetron, granisetron and metoclopramide
- Others: Dextromethorphan, LSD, methylenedioxymetamphetamine (ecstasy) and St. John's wort

Chronic Fatigue Syndrome

Diagnostic criteria

Severe fatigue > 6 months

+

4 or > of the following symptoms

1. Impairment of short-term memory or concentration
2. Sore throat
3. Tender cervical or axillary nodes
4. Muscle pain
5. Arthralgias without redness and swelling
6. Headache
7. Difficulty sleeping
8. Postexertional malaise lasting \geq 24h

Knee Pain \geq /p Trauma

Ottawa Rules:

- Age \geq 55
- Head of fibula tenderness
- Head of patella tenderness
- Inability to flex to 90°
- Inability to bear weight immediately and during evaluation

*- if any present \rightarrow image otherwise f/u + RICE
 Rest
 Ice
 Compression
 Elevation*

Dry Eyes - Tx: Levimefine
- Keratoconjunctivitis sicca (KCS)
- Sjogren's Syndrome

Histories in Ophthalmology

1. Sudden onset of left eye pain + left facial pain + blurring of vision + vomiting + headache + pupil moderately dilated and fixed + erythema in circumcorneal area (ciliary flush) + hazy cornea

Dx: Acute angle closure glaucoma
Tx: miotics + ophtho consult

2. Recurrent headaches + decreased peripheral vision + seeing halos around lights + difficulty adapting to darkness + cupping of the optic disc

Dx: open angle glaucoma
Tx: β -blocker eye drops, pilocarpine, sx
cup:disc ratio ≥ 0.5

3. Acute red eye + photophobia + eye pain + blurring of vision + small and irregular pupil + ciliary flush + puss in anterior chamber (hypopyon)

Dx: Anterior uveitis
Tx: Topical steroids + ophtho eval

4. Ptosis right eye + right pupil constricted but normally reacting

5. Sudden visual loss left eye + cherry red spot at fovea

Dx: Horner's syndrome
Tx: ✓ CXR \rightarrow paraneoplastic tumor eval.

6. Visual loss in one eye + fundus shows venous tortuosity and dilatation, hemorrhage and cotton wool spot

Dx: Central retinal vein occlusion
Tx: d risk w/ HTN + hyperviscosity

7. Acute red eye + visual loss + foreign body sensation + ciliary flush + eye pain

Dx: Iceratitis (usually viral)
Tx: Eyedrops (+ Abx if bacterial)
Assoc. w/ contact lens / corneal abrasion

8. Acute bilateral red eye + no photophobia + no visual loss + watery discharge + tender preauricular nodes

Dx: viral conjunctivitis
Tx: Eyedrops (+ Abx if bacterial)
Bacterial causes:
1) Pseudomonas
2) Serratia
 \rightarrow parallel D/C

9. Headache + bitemporal hemianopsia

Dx: optic chiasma

10. Dense right homonymous visual field defect

Dx: occipital lobe

11. New onset of floaters + brief flashes of light on extreme lateral gaze

Dx: Retinal detachment

12. 30-year-female with gradual visual loss left eye + absent direct papillary response and normal consensual papillary response (RAPD pupil)

Dx: Optic Neuritis

Tx: Methyl prednisolone then Prednisone

13. Acute unilateral, localized, and sharply circumscribed redness in one eye + no discharge or pain

Dx: Subconjunctival Hemorrhage

14. Bilateral red eye + itching + mucoid discharge + nasal congestion

Dx: Allergic conjunctivitis

15. RA + painful red eye + focal conjunctival injection with a purplish hue

Tx: Topical Anti histamine

16. ICU patient + unilateral red eye + extensive white cornea

Dx: Pseudomonas keratitis

17. SLE patient on Prednisone + acute red eye + visual loss + puss in the anterior chamber

Dx: Bacterial Endophthalmitis

18. Patient on TPN + sudden loss of vision + redness + fever

Dx: Candidal Endophthalmitis

19. 70-year-female with gradual central visual loss + fading colors + visual distortions + difficulty seeing faces + need for increased light + Drusen of macula

Dx: Age-Related Macular Degen.
Tx: Anti-oxidants

20. Abrupt onset of copious purulent discharge both eyes + lid swelling + pain

Dx: Neovascularization
Tx: Laser Tx
- oxidative w/ vs. dry
- choroidal neovascularization
 \rightarrow soft brucy
 \rightarrow pigmentation abnormal
 \rightarrow geographic atrophy

21. Eye hit by a base ball + blood in the anterior chamber + clear sclera

Dx: Hyphema

Dx: Lipema Retinalis
- retinal lipid deposits

Dx: Central Retinal Art. Occlusion
 \uparrow ESR \rightarrow r/o temporal arteritis

Dx: Scleritis or Episcleritis

Dx: GC conjunctivitis

Dx: Neovascularization
Tx: Laser Tx