REFERENCES AND HELPFUL RESOURCES
Centers for Disease Control: http://www.cdc.gov
Clinical Evidence from the British Medical Journal: http://www.clinicalevidence.com
Healthlinks: http://www.healthlinks.washington.edu

ROTATION TIPS
- Be proactive! Because of the wide variety of patients and medical conditions, this clerkship is a great opportunity to explore areas of interest. Ask for more involvement in deliveries, with kids, or with hospitalized patients if you are interested. This rotation offers a chance to manage patients both in the clinic and ER.
- Be aggressive about offering assessment and plans. Attendings can be quick to interject into your presentation what THEIR A/P is, but they notice if you try to come up with your own.

SELECTED FAMILY MEDICINE TOPICS
This section focuses mostly on outpatient topics. Please see other sections (Medicine, OB, Peds, etc.) for other relevant topics.

Diabetes (adapted from ACP Diabetes Care Guide, 2007)

Screening
- Fasting plasma glucose level; encouraged in all >45 yo q3 yrs
  - < 100 mg/dL normal
  - 100 – 125 mg/dL impaired glucose tolerance
  - ≥ 126 mg/dL DM

Diagnosis
- Fasting plasma glucose ≥ 126 (after ≥ 8 hours of fasting); symptoms of diabetes and casual plasma glucose of ≥ 200; OR plasma glucose ≥ 200mg/dL 2 hours after ingestion of 75 g of oral glucose.

Risk Factors
- FHx, obesity, race, h/o GDM, HTN, PCOS, hypertriglyceridemia

Oral Medications by Class

Biguanides: Metformin (Glucophage, generic) is the only biguanide sold in the US.
  - Mechanism – mainly decreases hepatic glucose production; also increases peripheral glucose utilization. The most common side effects are GI-cramping and diarrhea. Rare lactic acidosis especially if decreased renal function.

Sulfonylureas: Glyburide (generic), glipizide (generic), glimepiride (Amaryl)
  - Mechanism – increase insulin secretion. Side effects include weight gain and hypoglycemia.

Thiazolidinediones: Pioglitazone (Actos), Rosiglitazone (Avandia)
  - Mechanism – decrease insulin resistance and increase insulin sensitivity of adipose tissue, skeletal muscle, and liver. Side effects of peripheral edema and weight gain.
Often used in combination with metformin and/or sulfonylureas

Non-sulfonylurea secretagogues: Nateglinide (Starlix), Repaglinide (Prandin)
Mechanism – increase insulin secretion
Used much less frequently than sulfonylureas
Rapid onset – take before meal. Must eat afterward.

Alpha-glucosidase inhibitors: Acarbose (Precose), miglitol (Glyset)
Mechanism – inhibit alpha-glucosidase enzyme at intestinal brush border. Must be taken with each meal. Many GI adverse effects.

Dipeptidyl Peptidase IV Inhibitors: Sitagliptin (Januvia)
Mechanism – inhibit dipeptidyl peptidase IV preventing breakdown of GLP-1 which causes increased insulin release and suppression of glucagon release. Weight neutral.

Injectable Medications:

**Insulin**

<table>
<thead>
<tr>
<th>INSULIN TYPE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHORT-ACTING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>30-60 min</td>
<td>2-4 hours</td>
<td>3-6 hours</td>
</tr>
<tr>
<td>Insulin lispro (Humalog)</td>
<td>&lt;15 min</td>
<td>1-2 hours</td>
<td>3-5 hours</td>
</tr>
<tr>
<td>Insulin aspart (Novolog)</td>
<td>&lt;15 min</td>
<td>1-2 hours</td>
<td>3-5 hours</td>
</tr>
<tr>
<td>Insulin glulisine (Apidra)</td>
<td>10-30 min</td>
<td>0.5-3 hours</td>
<td>3-5 hours</td>
</tr>
<tr>
<td><strong>INTERMEDIATE-ACTING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPH/Lente</td>
<td>2-4 hours</td>
<td>4-10 hours</td>
<td>10-16 hours</td>
</tr>
<tr>
<td><strong>LONG-ACTING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glargine (Lantus)</td>
<td>2-4 hours</td>
<td>no peak</td>
<td>20-24 hours</td>
</tr>
<tr>
<td>Insulin Detemir (Levemir)</td>
<td>1-2 hours</td>
<td>Minimal/2-12 hours</td>
<td>Up to 24 hours</td>
</tr>
</tbody>
</table>

Exenatide (Byetta)
Mechanism – GLP-1 analogue. Major effect of lowering post-prandial glucose. Causes weight loss, nausea/vomiting, and hypoglycemia if used in conjunction with sulfonylurea.

Pramlintide (Symlin)
Mechanism – Amylin analogue potentiating the effects of insulin. Major effect is again lowering post-prandial glucose. Causes weight loss, hypoglycemia, and nausea/vomiting.

**Hyperlipidemia**

**Testing:**
Screening (nonfasting) – Total cholesterol (TC), HDL
Full lipid panel (fasting) – Total, LDL, HDL, triglycerides (TG)
• LDL is calculated: TC – HDL – TG/5 = LDL
• LDL cannot be calculated if TG>400

LDL Treatment Guidelines:

<table>
<thead>
<tr>
<th>RISK CATEGORY</th>
<th>LDL GOAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD and CHD risk equivalents (see below)</td>
<td>&lt;70</td>
</tr>
<tr>
<td>Multiple (2+) risk factors (see below)</td>
<td>&lt;130</td>
</tr>
<tr>
<td>0-1 risk factor (see below)</td>
<td>&lt;160</td>
</tr>
</tbody>
</table>

CHD risk equivalents:
Diabetes
Other clinical forms of atherosclerotic disease (PVD, AAA, carotid disease w/sx)
Multiple risk factors (see below) indicating a 10 year risk for CHD >20% based on Framingham risk scores (see NCEP report for details).

Risk factors:
Cigarette smoking
Hypertension (BP >140/90 or on antihypertensive medication)
Low HDL (<40)
FHx of premature CHD (1st degree relative: male <55 years, female <65 years)
Age (men >45 years, women >55 years)
NOTE: HDL >60 counts as a “negative” risk factor (subtract 1 from total number of risks)

Treatment of Hyperlipidemia

<table>
<thead>
<tr>
<th>DRUG CLASS</th>
<th>EFFECTS</th>
<th>SIDE EFFECTS</th>
</tr>
</thead>
</table>
| Statins (HMG-CoA reductase inhibitors) | LDL ↓ 18%-55%  
HDL ↑ 5%-15%  
TG ↓ 7%-30% | Myopathy, increased liver enzymes, expect lipid lowering effect within 6 weeks |
| Bile acid sequestrants | LDL ↓ 15%-30%  
HDL ↑ 3%-5%  
TG No change or increase | GI distress, constipation, decreased absorption of other meds |
| Nicotinic acid (niacin) | LDL ↓ 5%-25%  
HDL ↑ 15%-35%  
TG ↓ 20%-50% | Flushing (reduced with ASA therapy), GI distress, hepatotoxicity, worsened diabetes control |
| Fibric acids | LDL ↓ 5%-20%  
HDL ↑ 10%-20%  
TG ↓ 20%-50% | Dyspepsia, gallstones, myopathy |
| Cholesterol absorption inhibitor (ezetimibe) | LDL ↓ 17% | ? increased cancer risk; increased transaminase |
Hypertension

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SYSTOLIC</th>
<th>DIASTOLIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>&lt;80</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120-139</td>
<td>80-89</td>
</tr>
<tr>
<td>Stage 1 HTN</td>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>Stage 2 HTN</td>
<td>≥160</td>
<td>≥100</td>
</tr>
</tbody>
</table>

- Diagnosis is based on 2 or more readings at 2 or more visits. (Use the average.)
- If systolic and diastolic readings fall in different categories, the higher category is selected.

Etiology
Essential hypertension: 90% (aka primary or idiopathic)  
Secondary hypertension:10%  
Causes: Acute or chronic renal failure, renal artery stenosis due to atherosclerotic disease (more common in older males), renal artery stenosis due to fibromuscular dysplasia (more common in younger females), sleep apnea, primary hyperaldosteronism, pheochromocytoma, Cushing’s syndrome, hypo/hyperthyroidism, hyperparathyroidism, aortic coarctation, Cigarettes, caffeine, pain, anxiety, drugs (amphetamines, cocaine), medications (cold medicine, NSAIDs, oral contraceptive pills, steroids, TCAs, cyclosporine), ephedra, ma huang, licorice (an aldosterone agonist, licorice root is used in many herbals)

Evaluation for all patients at initial diagnosis should include
- Careful lifestyle evaluation and assessment of cardiovascular risk factors
- Identify secondary causes of hypertension
- Assess presence or absence of target-organ damage (e.g., renal disease)

Relevant initial studies
- ECG – screen for LVH, ischemia
- BUN, Cr, Na, K – screen for renal disease, hyperaldosteronism
- Glucose – screen for diabetes and Cushing’s
- Hct – screen for anemia
- UA – screen for renal disease
- Lipid profile
When to suspect secondary hypertension

- Onset of hypertension prior to age 30
- Onset (not just diagnosis) after age 50
- Sudden onset hypertension
- Poor response to anti-hypertensives or increase in blood pressure after previous period of good response to anti-hypertensives

Possible work-up for secondary hypertension

- Renal artery duplex (renal artery stenosis)
- Renin/aldosterone ratio (primary hyperaldosteronism)
- 24 hour urine cortisol (Cushing’s)
- 24 hour VMA, metanephrines, catecholamines (pheo)
- Ankle/arm indices – >1 is normal (aortic coarctation)
- TSH
- PTH if patient has hypercalcemia
- Think of alcohol and sleep apnea

Blood pressure goals:
- For most: <140/90
- For patients with diabetes or renal disease: <130/80

Treatment

**Lifestyle modification**
Weight reduction, dietary sodium reduction, DASH diet, exercise

**Thiazide diuretics**
Recommended initial therapy in uncomplicated patients

**Beta blockers**
Indicated for patients with stable CHF or prior MI. May also benefit those with migraine or essential tremor.

**ACE inhibitors**
First or second line. Recommend for patients with CHF, prior MI, diabetic nephropathy, chronic renal failure

**ARBs**
Likely the same indications as ACE inhibitors but not fully proven, use when ACE inhibitors are not tolerated

**Alpha blockers**
Consider in patients with BPH, not usually a first-line HTN agent

**CCBs**
First or second line. Particular use when CAD, intermittent claudication, migraine, or Raynaud’s. Avoid non-dihydropyridine CCBs with beta blockers.

**Aldosterone antag’s**
Used for add-on therapy for resistant hypertension or in those with primary hyperaldosteronism

**Cental alpha agonists**
Used for add-on therapy. Watch for rebound hypertension with abrupt discontinuation.

Musculoskeletal

Shoulder Pain Differential Diagnosis

**Young adults**
Overuse injuries, subluxation, shoulder instability, fractures, AC separation

**Older adults**
Rotator cuff tendonitis or impingement syndrome, rotator cuff tears, subacromial bursitis, adhesive capsulitis (frozen shoulder), bicipital tendonitis, osteoarthritis, fractures, AC separation,
myofascial pain, cervical spine radiculopathy, polymyalgia rheumatica

Low Back Pain Differential Diagnosis

- Lumbar strain (70% of all adult primary care patients with back pain)
- Degenerative disk disease (DJD) (10%)
- Herniated disk (4%)
- Spinal stenosis (3%)
- Osteoporotic compression fracture (4%)
- Spondylolithesis (2%)
- Others: traumatic fracture, congenital disease, spondylolysis, neoplastic disease, infection (including shingles), inflammatory arthritis, referred pain from visceral disease (prostatitis, chronic PID, nephrolithiasis, pyelonephritis, AAA, pancreatitis, cholecystitis)

Knee Pain Differential Diagnosis

- Medial knee pain: Medial compartment osteoarthritis, pes anserine bursitis, MCL injury, medial meniscal tear, referred pain from hip
- Anterior knee pain: Injury of quad mechanism (quad muscle, quad tendon, patella, patellar tendon), large knee effusions, patellofemoral syndrome, advanced osteoarthritis involving entire knee, prepatellar bursitis, patellar tendonitis ("jumper’s knee"), inflammatory arthritis, septic arthritis, Osgood Schlatter disease (epiphysitis occurring in patients under age 19)
- Lateral knee pain: Iliotibial band syndrome, lateral compartment osteoarthritis, LCL injury, lateral meniscus tears

Preventive Medicine / Screening

USPSTF = U.S. Preventive Services Task Force
NCEP = National Cholesterol Education Program
ACS = American Cancer Society

1. Hypertension
   - USPTSTF recommends periodic screening for all persons > 18 years old.
   - JNC VII: Recheck every 2 years if SBP<120 and DBP <80.
   - Recheck every year if SBP 120-139 DBP 80-89.
   - Check BP every visit.

2. Hyperlipidemia
   - USPSTF recommends screening for men 35 years and older. Include men age 20-35 and women age > 20 if other risk factors for heart disease are present.
   - USPSTF screening includes total cholesterol and HDL (both can be measured non-fasting). If elevated, order fasting lipid panel.
   - NCEP recommends full fasting lipid panel every 5 years for adults 20 or older.

3. Type 2 diabetes
   - USPSTF recommends screening in asymptomatic with sustained blood pressure greater than 135/80.

4. Colorectal Cancer
• All individuals 50 -75 years old should be screened. (Earlier for patients with family history of colon cancer, FAP, or HNPCC)
• Screening options: FOBT (3 stool card samples) every year, combination of FOBT every 3 years and flex sig every 5 years, colonoscopy every 10 years.

5. Breast Cancer
• Consensus: women ages 50-69 should be screened annually with clinical breast exam and mammography.
• Recommendation varies for women ages 40-49.
• USPSTF recommends screening mammography with or without clinical breast exam every 1-2 years for women ages 40 and older.
• American Cancer Society, American College of Obstetricians and Gynecologists, American College of Radiology, and American Medical Association recommend screening beginning at age 40 (most recommend every 1-2 years between ages 40-49, then yearly).
• American College of Physicians and American Academy of Family Practice recommend screening for average risk females beginning at age 50.

6. Cervical Cancer
• Most groups (ACOG, AAFP, AMA, AAP) continue to recommend initiation of Pap test screening at age 18 or when sexually active. Screen annually until at least 3 normal Pap tests, then q 2-3 years.
• ACS now recommends initiation of screening 3 years after the onset of sexual activity but no later than age 21. Screen with annual Pap test or q 2 years if liquid-based cytology (ThinPrep) is used until age 30. After age 30, screen q 2-3 years if low risk and no history of abnormal results.
• Continue screening until age 65-70 (USPSTF recommends age 65) if repeated normal Pap tests or following total hysterectomy (including cervix) for benign disease.

7. Prostate Cancer
• Remains controversial.
• USPSTF does not recommend for or against PSA and digital rectal exam (DRE) for prostate cancer screening.
• ACS recommends that DRE and PSA be discussed and offered annually to men age 50 and over who have a life expectancy of at least 10 years. Consider earlier screening (age 45) for African-American men or those with a first-degree relatives with prostate cancer before 65 years of age.
• Counsel patients on an individual basis regarding these screening tests.

8. Osteoporosis
• USPSTF recommends women ages 65 and older be screened (bone density scan, i.e. DXA). Screen women ages 60 and older if risk factors are present.

9. Chlamydial Infection
• USPSTF recommends routine screening of all sexually active women age 24 and younger, and other asymptomatic women at increased risk.