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A Davis's Notes Book


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Adult Men's Health Screening Guidelines

Screening Tests	Ages 18–39	Ages 40–49	Ages 50–64	Ages 65 and Older
General health Full checkup, including weight and height	Every 5 years	Yearly	Yearly	Yearly
Heart health Blood pressure test Cholesterol test	At least every 2 years Start at age 20	At least every 2 years Every 3 years Every year if hyperlipidemia present	At least every 2 years Every 3 years Every year if hyperlipidemia present	At least every 2 years Every 3 years Every year if hyperlipidemia present
Diabetes Blood sugar test		Start at age 45, then every 3 years	Every 3 years	Every 3 years
Prostate health Digital rectal exam (DRE) Prostate-specific antigen (PSA) blood test		Yearly Yearly	Yearly Yearly	Yearly Yearly

Continued

Adult Men's Health Screening Guidelines—cont'd

Screening Tests	Ages 18–39	Ages 40–49	Ages 50–64	Ages 65 and Older
Reproductive health				
Testicular exam	Monthly self-exam; part of a general checkup	Monthly self-exam; part of a general checkup	Monthly self-exam; part of a general checkup	Monthly self-exam; part of a general checkup
Chlamydia test Sexually transmitted disease (STD) tests	If risk factors exist, both partners should get tested for STDs, including HIV, before having sexual intercourse	If risk factors exist, both partners should get tested for STDs, including HIV, before having sexual intercourse	If risk factors exist, both partners should get tested for STDs, including HIV, before having sexual intercourse	If risk factors exist, both partners should get tested for STDs, including HIV, before having sexual intercourse
Colorectal health				
Fecal occult blood test			Yearly	Yearly
Flexible sigmoidoscopy (with fecal occult blood test is preferred)			Every 5 years (if not having a colonoscopy)	Every 5 years (if not having a colonoscopy)

Continued

Adult Men's Health Screening Guidelines—cont'd

Screening Tests	Ages 18–39	Ages 40–49	Ages 50–64	Ages 65 and Older
Double contrast barium enema (DCBE)			Every 5–10 years (if not having a colonoscopy or sigmoidoscopy)	Every 5–10 years (if not having a colonoscopy or sigmoidoscopy)
Colonoscopy			Every 10 years	Every 10 years
Rectal exam			Every 5–10 years with each screening (sigmoidoscopy, colonoscopy, or DCBE)	Every 5–10 years with each screening (sigmoidoscopy, colonoscopy, or DCBE)
Eye and ear health				
Eye exam	If you have any vision problems; at least one exam from ages 20–29 and at least two exams from ages 30–39	Every 2–4 years	Every 2–4 years	Every 1–2 years
Hearing test	Starting at age 18, then every 10 years	Every 10 years	Every 3 years	Every 3 years

Continued

Adult Men's Health Screening Guidelines—cont'd

Screening Tests	Ages 18–39	Ages 40–49	Ages 50–64	Ages 65 and Older
Skin health Mole exam	Monthly mole self-exam; by a provider every 3 years, starting at age 20	Monthly mole self-exam; by a provider every year	Monthly mole self-exam; by a provider every year	Monthly mole self-exam; by a provider every year
Oral health Dental exam	One to two times every year	One to two times every year	One to two times every year	One to two times every year
Mental health screening	Discuss with your provider or nurse	Discuss with your provider or nurse	Discuss with your provider or nurse	Discuss with your provider or nurse
Immunizations Influenza vaccine Pneumococcal vaccine Tetanus-diphtheria booster vaccine Meningococcal vaccine	 Yearly if risk factors exist Every 6–8 years if risk factors warrant Every 10 years Discuss with your provider if attending college	 Yearly if risk factors exist Every 6–8 years if risk factors warrant Every 10 years	 Yearly if risk factors exist Every 6–8 years if risk factors warrant Every 10 years	 Yearly if risk factors exist One time only Every 10 years

Adult Women's Health Screening Guidelines

Screening Tests	Ages 18–39	Ages 40–49	Ages 50–64	Ages 65 and Older
General health				
Full checkup, including weight and height	Yearly	Yearly	Yearly	Yearly
Thyroid stimulating hormone test (TSH)	Start at age 35, then every 5 years	Every 5 years	Every 5 years	Every 5 years
Heart health				
Blood pressure test	At least every 2 years	At least every 2 years	At least every 2 years	At least every 2 years
Cholesterol test	Starting at age 20, every 3 years	Every 3 years	Every 3 years	Every 3 years
Bone health				
Bone mineral density test	Discuss need for adequate calcium	Discuss need for adequate calcium	Bone mineral density test at menopause	Bone mineral density test every 2 years
Diabetes				
Blood glucose test		Start at age 45, then every 3 years	Every 3 years	Every 3 years
Breast health				
Mammogram (x-ray of breast)		Every 1–2 years	Every 1–2 years	Every 1–2 years

Continued

Adult Women's Health Screening Guidelines—cont'd

Screening Tests	Ages 18–39	Ages 40–49	Ages 50–64	Ages 65 and Older
Reproductive health				
Pap test and pelvic exam	Yearly until age 25 if sexually active	Every 1–3 years	Every 1–3 years	Every 1–3 years sexually active, pelvic exam yearly
Chlamydia test	Older than age 25, if new or multiple partners	If new or multiple partners	If new or multiple partners	If new or multiple partners
Sexually transmitted disease tests	Both partners should get tested for STDs, including HIV, before having sexual intercourse	Both partners should get tested for STDs, including HIV, before having sexual intercourse	Both partners should get tested for STDs, including HIV, before having sexual intercourse	Both partners should get tested for STDs, including HIV, before having sexual intercourse
Mental health screening	As needed	As needed	As needed	As needed

Continued

Adult Women's Health Screening Guidelines—cont'd

Screening Tests	Ages 18–39	Ages 40–49	Ages 50–64	Ages 65 and Older
Colorectal health				
Fecal occult blood test			Yearly	Yearly
Flexible sigmoidoscopy (with fecal occult blood test is preferred)			Every 5 years (if not having a colonoscopy)	Every 5 years (if not having a colonoscopy)
Double contrast barium enema			Every 5–10 years (if not having a colonoscopy or sigmoidoscopy)	Every 5–10 years (if not having a colonoscopy or sigmoidoscopy)
Colonoscopy			Every 10 years	Every 10 years
Rectal exam			Every 5–10 years with each screening (sigmoidoscopy, colonoscopy, or DCBE)	Every 5–10 years with each screening (sigmoidoscopy, colonoscopy, or DCBE)

Continued

Adult Women's Health Screening Guidelines—cont'd

Screening Tests	Ages 18–39	Ages 40–49	Ages 50–64	Ages 65 and Older
Eye and ear health				
Eye exam	One exam from ages 20–29, and at least two exams from ages 30–39	Every 2–4 years	Every 2–4 years	Every 1–2 years
Hearing test	Starting at age 18, then every 10 years	Every 10 years	Every 3 years	Every 3 years
Skin health				
Mole exam	Monthly mole self-exam and at yearly visit	Monthly mole self-exam and at yearly visit	Monthly mole self-exam and at yearly visit	Monthly mole self-exam and at yearly visit
Oral health				
Dental exam	One to two times every year	One to two times every year	One to two times every year	One to two times every year

Continued

Adult Women's Health Screening Guidelines—cont'd

Screening Tests	Ages 18–39	Ages 40–49	Ages 50–64	Ages 65 and Older
Immunizations Influenza vaccine	If risk factors are present	If risk factors are present	Yearly	Yearly
Pneumococcal vaccine	If risk factors are present	If risk factors are present	If risk factors are present	One time only
Tetanus-diphtheria booster vaccine	Every 10 years	Every 10 years	Every 10 years	Every 10 years
Human papillomavirus vaccine (HPV)	Up to age 26			
Meningococcal vaccine	Recommended before attending college			
Herpes zoster vaccine (to prevent shingles)			Starting at age 60, one time only	Starting at age 60, one time only

Medicare Preventative Services (Covered Under Medicare Part B)

Test	How Often Medicare Covers
"Welcome to Medicare" physical exam (includes vision screening and EKG)	Within the first 6 months of enrollment
Cholesterol screening	Once every 5 years
Mammogram	Once every 12 months
Pap test	Once every 24 months
Fecal occult blood test	Once every 12 months
Sigmoidoscopy	Once every 48 months
Barium enema	Once every 48 months is used instead of sigmoidoscopy or colonoscopy
DRE for prostate screening	Once every 12 months
PSA	Once every 12 months
Flu shot	Yearly
Pneumonia shot	Once
Hepatitis B vaccination	Three shots in recommended sequence
Fasting glucose test	Yearly
Glaucoma study	Once every 12 months
Smoking cessation	8 face-to-face visits in a 12-month period

Adult Treatment Panel (ATP) III Guidelines for Cholesterol Management

Step 1: Determine Lipoprotein Levels

Obtain complete lipoprotein profile after 9- to 12-hour fast.

ATP III Classification of LDL Cholesterol (mg/dL)

- <100: Optimal
- 100 to 129: Near optimal/above optimal
- 130 to 159: Borderline high
- 160 to 189: High
- 190: Very high

ATP III Classification of Total Cholesterol (mg/dL)

- <200: Desirable
- 200 to 239: Borderline high
- 240: High

ATP III Classification of HDL Cholesterol (mg/dL)

- <40: Low
- 60: High

Step 2: Determine Risk Category

- Establish LDL goal of therapy.
- Determine need for therapeutic lifestyle changes.
- Determine level for drug consideration.

LDL Cholesterol Goals and Cutpoints for TLC and Drug Therapy in Different Risk Categories

Risk Category	LDL Goal	LDL Level to Initiate TLC	LDL Level to Consider Drug Therapy
CHD or CHD risk equivalents (10-year risk >20%)	<100 mg/dL	≥100 mg/dL	≥130 mg/dL (100–129 mg/dL: drug optional)*

Continued

LDL Cholesterol Goals and Cutpoints for TLC and Drug Therapy in Different Risk Categories—cont'd

Risk Category	LDL Goal	LDL Level to Initiate TLC	LDL Level to Consider Drug Therapy
2+ risk factors (10-year risk 20%)	<130 mg/dL	≥130 mg/dL	10-year risk 10%–20%: ≥130 mg/dL 10-year risk <10%: ≥160 mg/dL
0–1 risk factor	<160 mg/dL	≥160 mg/dL	≥190 mg/dL (160 189 mg/dL: LDL-lowering drug optional)

Step 3: Initiate TLC If LDL Is Above Goal

- TLC diet
  - Saturated fat <7% of calories; cholesterol <200 mg/day
  - Increased viscous (soluble) fiber (10–25 g/day) and plant stanols/sterols (2 g/day) as therapeutic options to enhance LDL lowering
- Weight management
- Increased physical activity

Step 4: Consider Adding Drug Therapy

- Consider drug simultaneously with TLC for CHD and CHD equivalents. Consider adding drug to TLC after 3 months for other risk categories.

Drugs Affecting Lipoprotein Metabolism

Drug Class	Agents and Daily Doses	Lipid/Lipoprotein Effects	Side Effects	Contraindications
HMG CoA reductase inhibitors (statins)	Lovastatin (20–80 mg) Pravastatin (20–40 mg) Simvastatin (20–80 mg) Fluvastatin (20–80 mg) Atorvastatin (10–80 mg) Cerivastatin (0.4–0.8 mg)	LDL-C (18%–55%) HDL-C (5%–15%) TG (7%–30%)	Myopathy Increased liver enzymes	**Absolute:** Active or chronic liver disease **Relative:** Concomitant use of certain drugs
Bile acid sequestrants	Cholestyramine (4–16 g) Colestipol (5–20 g) Colesevelam (2.6–3.8 g)	LDL-C (15%–30%) HDL-C (3%–5%) TG (no change)	Gastrointestinal distress Constipation Decreased absorption of other drugs	**Absolute:** Dysbeta-lipoproteinemia G >400 mg/dL **Relative:** TG >200 mg/dL

Continued

Drugs Affecting Lipoprotein Metabolism—cont'd

Drug Class	Agents and Daily Doses	Lipid/Lipoprotein Effects	Side Effects	Contraindications
Nicotinic acid	Immediate-release (crystalline) nicotinic acid (1.5–3 g) Extended-release nicotinic acid (Niaspan®) (1–2 g) Sustained-release nicotinic acid (1–2 g)	LDL-C (5%–25%) HDL-C (15%–35%) TG (20%–50%)	Flushing Hyperglycemia Hyperuricemia (or gout) Upper GI distress Hepatotoxicity	**Absolute:** Chronic liver disease Severe gout **Relative:** Diabetes Hyperuricemia Peptic ulcer disease
Fibric acids	Gemfibrozil (600 mg bid) Fenofibrate (200 mg) Clofibrate (1000 mg bid)	LDL-C (5%–20%; may be increased in patients with high TG) HDL-C (10%–20%) TG (20%–50%)	Dyspepsia Gallstones Myopathy	**Absolute:** Severe renal disease Severe hepatic disease

CAGE Questionnaire

Question	Yes	No
Cut down: Have you ever felt that you should cut down on your drinking or use of drugs?	1	0
Annoyed: Have you ever felt annoyed by being criticized about your drinking or use of drugs?	1	0
Guilty: Have you ever felt guilty about drinking or using drugs?	1	0
Eye-opener: Have you ever needed an eye-opener (alcohol or drugs) after waking up in order to get rid of a hangover or calm your nerves?	1	0
TOTAL		
NOTE: A total score of 2 or greater is considered clinically significant and indicates a high likelihood for alcoholism.		

Source: Ewing, J.A.: Detecting alcoholism: The CAGE questionnaire. *JAMA* 252:1905–1907, 1984.

RAFT Questionnaire

Question	Yes	No
Relaxation: Do you ever use drugs or drink alcohol in order to relax or improve your self-esteem?	1	0
Alone: Do you every use drugs or drink alcohol while you are alone?	1	0
Friends: Do you have any friends who use drugs or have a problem with alcohol?	1	0
Trouble: Have you ever gotten into trouble because of drugs or alcohol?	1	0
Total:		
Note: Any positive answer warrants further investigation.		

Source: Riggs S., and Alario A.: Adolescent substance use. In Dube C.E., Goldstein M.G., Lewis D.C., et al, (eds). *Project ADEPT Curriculum for Primary Care Physician Training. Volume II, Special Topics.* Providence, RI, Brown University, 1989.

Zung Self-Rating Depression Scale

Item	A Little of the Time	Some of the Time	A Good Part of the Time	Most of the Time
I feel down-hearted and blue.	1	2	3	4
Morning is when I feel best.	4	3	2	1
I have crying spells or feel like it.	1	2	3	4
I have trouble sleeping at night.	1	2	3	4
I eat as much as I used to.	4	3	2	1
I still enjoy sex.	4	3	2	1
I notice that I am losing weight.	1	2	3	4
I have trouble with constipation.	1	2	3	4
My heart beats faster than usual.	1	2	3	4
I get tired for no reason.	1	2	3	4
My mind is as clear as it used to be.	4	3	2	1
I find it easy to do the things I used to do.	4	3	2	1
I am restless and can't keep still.	1	2	3	4
I feel hopeful about the future.	4	3	2	1
I am more irritable than usual.	1	2	3	4
I find it easy to make decisions.	4	3	2	1
I feel that I am useful and needed.	4	3	2	1
My life is pretty full.	4	3	2	1
I feel that others would be better off if I were dead.	1	2	3	4
I still enjoy the things I used to do.	4	3	2	1

Add up numbers for a total score. A score of greater than 45 is indicative of depression.
Adapted from Zung, W.W.K.: A self-rating depression scale. *Arch Gen Psychiatry* 12:63–70, 1965.

Edinburgh Postnatal Depression Scale

Physician Instructions

- Have the patient complete the scale by marking one answer for each question that comes closest to how she has felt in the past 7 days, not just how she feels today.
- Review item 10 in particular because it concerns thoughts of self-harm or possible suicide.

Scoring

- Responses are scored 0, 1, 2, and 3 according to the increased severity of symptoms.
- Items 3 and 5 through 10 are reverse scored (for example, 3, 2, 1, 0).
- The total score is the sum of all item scores.
- Women with scores higher than 12 are likely to be suffering from depression.

Edinburgh Postnatal Depression Scale

How have you felt during the past week (or the past 7 days)? In the past 7 days:

1.	I've been able to laugh and see the funny side of things:	
	•	As much as I always did.
	•	Not quite so much now.
	•	Definitely not so much now.
	•	Not at all.
2.	I've looked forward with enjoyment to things:	
	•	As much as I always did.
	•	Not quite so much now.
	•	Definitely not so much now.
	•	Not at all.
3.	I've blamed myself unnecessarily when things went wrong:	
	•	Yes, most of the time.
	•	Yes, some of the time.
	•	Not very often.
	•	No, never.

Continued

Edinburgh Postnatal Depression Scale—cont'd

How have you felt during the past week (or the past 7 days)? In the past 7 days:

4.	I've been anxious or worried for no good reason:
	• No, not at all.
	• Hardly ever.
	• Yes, sometimes.
	• Yes, very often.
5.	I've felt scared or panicky for no very good reason:
	• Yes, quite a lot.
	• Yes, sometimes.
	• No, not much.
	• No, not at all.
6.	Things have been getting on top of me:
	• Yes, most of the time I haven't been able to cope at all.
	• Yes, sometimes I haven't been coping as well as usual.
	• No, most of the time I have coped quite well.
	• No, I have been coping as well as ever.
7.	I've been so unhappy that I've had difficulty sleeping:
	• Yes, most of the time.
	• Yes, sometimes.
	• Not very often.
	• No, not at all.
8.	I've felt sad or miserable:
	• Yes, most of the time.
	• Yes, sometimes.
	• Not very often.
	• No, never.
9.	I've been so unhappy that I have been crying:
	• Yes, most of the time.
	• Yes, quite often.
	• Only occasionally.
	• No, never.

Continued

Edinburgh Postnatal Depression Scale—cont'd

How have you felt during the past week (or the past 7 days)? In the past 7 days:

10.	The thought of harming myself has occurred to me:
	• Yes, quite often.
	• Sometimes.
	• Hardly ever.
	• Never.

Source: Cox, J.L., Holden, J.M., and Sagovsky, R.: Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *Br J Psychiatry* 150:782–786, 1987

Nutritional Deficiency

Area/System	Symptom or Sign	Deficiency
Skin	Rash Easy bruising Rash in sun-exposed areas	Zinc, fatty acids, vitamins Vitamin C or K Niacin
Hair and nails	Thinning or loss of hair Premature whitening of hair Spooning of nails	Protein Selenium Iron
Eyes	Impaired night vision Corneal keratomalacia (corneal drying and clouding)	Vitamin A Vitamin A
Mouth	Cheilosis and glossitis Bleeding gums	Riboflavin, niacin, iron Vitamin C, riboflavin
Extremities	Edema	Protein
Neurologic	Paresthesias or numbness in a stocking-glove distribution Tetany Cognitive and sensory deficits Dementia	Thiamin Calcium and magnesium Thiamin, niacin, pyridium, vitamin B_{12} Thiamin, niacin, vitamin B_{12}

Continued

Area/System	Symptom or Sign	Deficiency
Musculoskeletal	Wasting of muscle Bone deformities (bowlegs, knocked knees, curved spine) Bone tenderness Joint pain or swelling	Protein Vitamin D, calcium Vitamin D Vitamin C
Gastrointestinal	Diarrhea Diarrhea and dysgeusia Dysphagia or odynophagia (from Plummer-Vinson syndrome)	Protein, niacin, folate, vitamin B_{12} Zinc Iron
Endocrine	Thyromegaly	Iodine

Geriatric Depression Scale

Choose the best answer for how you have felt over the past week:

1. Are you basically satisfied with your life? YES/NO
2. Have you dropped many of your activities and interests? YES/NO
3. Do you feel that your life is empty? YES/NO
4. Do you often get bored? YES/NO
5. Are you in good spirits most of the time? YES/NO
6. Are you afraid that something bad is going to happen to you? YES/NO
7. Do you feel happy most of the time? YES/NO
8. Do you often feel helpless? YES/NO
9. Do you prefer to stay at home, rather than going out and doing new things? YES/NO
10. Do you feel you have more problems with memory than most? YES/NO
11. Do you think it is wonderful to be alive now? YES/NO
12. Do you feel pretty worthless the way you are now? YES/NO
13. Do you feel full of energy? YES/NO

14. Do you feel that your situation is hopeless? YES/NO
15. Do you think that most people are better off than you are? YES/NO

Count 1 point for any of the following answers:
1. No 2. Yes 3. Yes 4. Yes 5. No 6. Yes 7. No 8. Yes 9. Yes
10. Yes 11. No 12. Yes 13. No 14. Yes 15. Yes

Score

1–3: Not depressed
4–7: Mildly depressed
8–11: Moderately depressed
12–15: Severely depressed

Source: Yesavage, J.A., Brink, T.L., Rose, T.L., et al: Development and validation of a geriatric depression screening scale: A preliminary report. *J Psychiatr Res* 17:37–49, 1983.

Simplified Nutrition Assessment Questionnaire (SNAQ)

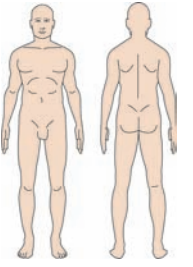
1. My appetite is
   a. Very poor
   b. Poor
   c. Average
   d. Good
   e. Very good
2. When I eat
   a. I feel full after eating only a few mouthfuls
   b. I feel full after eating about a third of the meal
   c. I feel full after eating more than half a meal
   d. I feel full after eating most of the meal
   e. I hardly ever feel full
3. Food tastes
   a. Very bad
   b. Bad
   c. Average
   d. Good
   e. Very good

4. Normally, I eat
   a. <1 meal a day
   b. 1 meal a day
   c. 2 meals a day
   d. 3 meals a day
   e. >3 meals a day

Points are assigned for the patient's answers as follows: a = 1, b = 2, c = 3, d = 4, e = 5. The sum is the SNAQ score. A SNAQ score of <14 indicates high risk of at least 5% weight loss within 6 months.

Adapted from Wilson, M.M., Thomas, D.R., Rubenstein, L.Z., et al: Appetite assessment: Simple appetite questionnaire predicts weight loss in community-dwelling adults and nursing home residents. *Am J Clin Nutr* 82(5):1074–1081, 2005; used with permission.

Visual Body Map



Mark the area of injury on a body map.
Score each incident according to the following scale:

- 1 = Threats of abuse, including use of a weapon
- 2 = Slapping, pushing, no injuries, and/or lasting pain
- 3 = Punching, kicking, bruises, cuts, and/or continuing pain
- 4 = Beating up, severe contusions, burns, broken bones
- 5 = Head injury, internal injury, permanent injury
- 6 = Use of weapon; wound from weapon

If any of the descriptions for a higher number apply, use the higher number.

Body Mass Index

- **Underweight:** <18.5
- **Normal weight:** 18.5–24.9
- **Overweight:** 25–29.9
- **Obesity:** 30 or greater

Domestic Violence Assessment

Framing Statements

Statements that may help you start the conversation.

- Because violence is so common in many people's lives, I've begun to ask all my patients about it.
- I'm concerned that your symptoms may have been caused by someone hurting you.
- I don't know if this is a problem for you, but many of the women I see as patients are dealing with abusive relationships. Some are too afraid or uncomfortable to bring it up themselves, so I've started asking about it routinely.
- Some of the women and men we see here who are gay are hurt by their partners. Does your partner ever try to hurt you?

Direct Verbal Questions

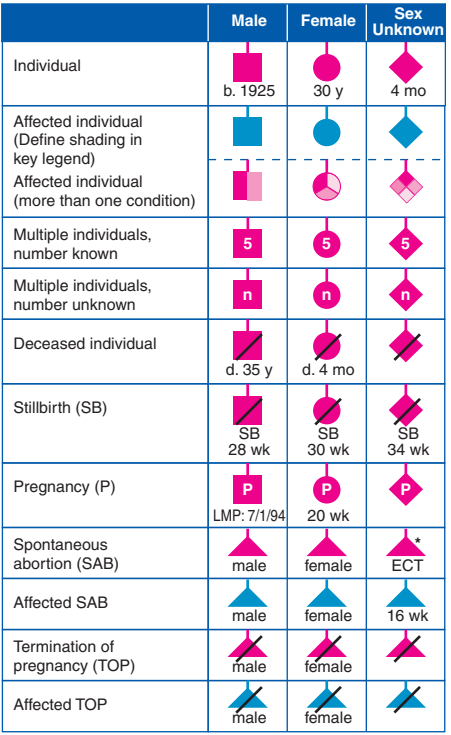
- Are you in a relationship with a person who physically hurts or threatens you?
- Did someone cause these injuries? Was it your partner?
- Has your partner or ex-partner ever hit you or physically hurt you? Has he or she ever threatened to hurt you or someone close to you? Do you feel controlled or isolated by your partner?
- Do you ever feel afraid of your partner? Do you feel you are in danger? Is it safe for you to go home?
- Has your partner ever forced you to have sex when you didn't want to? Has your partner ever refused to practice safe sex?
- Have you ever been hurt or threatened by your partner?
- Have you ever been hit, kicked, slapped, pushed, or shoved by your partner?

- Have you ever been hit, kicked, slapped, pushed, or shoved by your partner during this pregnancy?
- Have you ever been raped or forced to engage in sexual activity against your will?
- Are you currently or have you ever been in a relationship where you were physically hurt, threatened, or made to feel afraid?
- Have you ever been forced or pressured to have sex when you did not want to?

Developing a Genetic Pedigree Chart

A pedigree, or a picture of a medical family history using symbols, can be a time-saving, inexpensive diagnostic and screening tool. Many clinicians ask about family illnesses as part of a client's medical evaluation, writing out the history in textual form. However, once a clinician is used in generating a pedigree, it usually requires less time than writing out text, is easier to review later, and is often more concise and specific. An accurate pedigree can be just as useful in determining that a condition is not genetic as it is in establishing that a condition is inherited in a family. It is also extremely useful in assessing the hereditary component of common cancers, such as breast and colon cancer.

Common Symbols Used to Develop Genetic Pedigrees

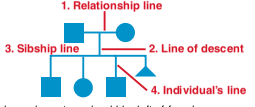


Source: Bennett, R.L., Steinhaus, K.A., Uhrich, S.B., et al: Recommendations for standardized human pedigree nomenclature. *Am J Hum Genet* 56:745–752, 1995.

*ECT—ectopic pregnancy

Pedigree Line Definitions

Definitions



If possible, male partner should be left of female partner on relationship side.

Sibling should be listed from left to right in birth order (oldest to youngest).

For pregnancies not carried to term (SABs and TOPs), the individual's line is shortened.

Relationships

A break in a relationship line indicates the relationship no longer exists. Multiple previous partners do not need to be shown if they do not affect genetic assessment.

Consanguinity

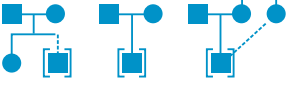
If degree of relationship not obvious from pedigree, it should be stated (e.g., third cousins) above relationship line.

Twins

No Children By Choice or Reason Unknown

Infertility

Adoptions



Source: Bennett, R.L., Steinhaus, K.A., Uhrich, S.B., et al: Recommendations for standardized human pedigree nomenclature. *Am J Hum Genet* 56:745–752, 1995.

Factual and Health Information to Include in a Pedigree

- Age/birth date or year of birth
- Age of death
- Cause of death
- Pregnancy with gestational age (last menstrual period) or estimated date of delivery
- Pregnancy complications with gestational age noted (such as 6 weeks, 34 weeks, etc.), miscarriage, stillbirth, or pregnancy termination
- Infertility versus no children by choice
- Relevant health information, such as height, weight
- Affected/unaffected status (define shading of symbol in key/legend)
- Testing status ("E" is used for evaluation on pedigree and defined in key/legend)
- Ethnic background
- Consanguinity (note degree of relationship if not implicit in pedigree)
- Date pedigree developed or updated
- Name of person who developed pedigree with credentials
- Key/legend

PQRSTOA Symptom Assessment

	Definition	Questions To Ask
P	Provocative (aggravating) or Palliative (alleviating)	When did you first experience this symptom? What makes it better? What makes it worse (exertion, stress, breathing, laying down)?
Q	Quality or Quantity	How would you describe how the symptom feels/looks/sounds? (e.g., if pain: dull, sharp, burning; if runny nose: color of exudate, any nose bleed)? How much are you experiencing now? Is it so much that it prevents you from performing any activities? Is it more or less than you experienced at any other time?

Continued

	Definition	Questions To Ask
R	Region or Radiation	Where does the symptom occur? In the case of pain, does it travel or radiate to any other part of your body?
S	Severity or Signs and Symptoms	How does the symptom rate on a severity scale of 1 to 10, with 10 being the most extreme? What other associated symptoms exist (e.g., pain has vomiting, sneezing has headache, stomach cramping has diarrhea)?
T	Timing	When did the symptom begin? How often does it occur? How long does it last? Is it sudden or gradual?
O	Onset	When did the symptom begin? Does it come and go or is it constant?
A	Associated Signs and Symptoms	What is happening when the symptoms appear? What other things happen when the symptoms appear?

Preventive Services Recommended by the USPSTF

Recommendation	Population	Specifics
Abdominal aortic aneurysm screening	Men	One-time screening by ultrasonography in men aged 65 to 75 who have ever smoked
Alcohol misuse screening and behavioral counseling interventions	Men Women	
Aspirin for the primary prevention of cardiovascular events	Men Women	Those older than age 40 with no contraindications

Continued

Recommendation	Population	Specifics
Breast cancer screening	Women	Every 2 to 3 years for women older than 40
Cervical cancer screening	Women	Those who are sexually active and have a cervix
Chlamydial infection screening	Women	Those who are sexually active
Colorectal cancer screening	Men Women	Age 50 and older
Dental caries in preschool children	Preschool children	Consider fluoride in children older than 6 months who do not have fluorinated water
Depression screening	Men Women	In clinical practices with systems to assure accurate diagnoses, effective treatment, and follow-up
Diabetes mellitus screening (type 2 diabetes)	Men Women	Adults with hyperlipidemia or hypertension
Diet counseling	Men Women	For reduced fat, weight loss, and other deficiencies in dietary habits
Gonorrhea screening	Women	All sexually active women
High blood pressure screening	Men Women	
HIV screening	Men Women Children	
Lipid screening	Men Women	Men older than 35; women older than 45
Obesity in adults screening	Men Women	Intensive counseling and behavioral interventions to promote sustained weight loss for adults who are obese

Continued

Recommendation	Population	Specifics
Osteoporosis	Postmenopausal women	Women 65 and older and women 60 and older at increased risk for osteoporotic fractures
Syphilis infection screening	Men Women	Persons at risk and all pregnant women
Tobacco use and tobacco-caused disease counseling	Men Women	Tobacco cessation interventions for those who use tobacco Augmented pregnancy-tailored counseling to pregnant women who smoke
Visual impairment in children younger than age 5 years screening	Children	To detect amblyopia, strabismus, and defects in visual acuity

Source: Adapted from Agency for Healthcare Research and Quality. *The Guide to Clinical Preventive Services: Recommendations of the U.S. Preventive Service Taskforce.* Washington, DC, AHRQ, 2006.

Vision Testing

Test	Test performance	Findings
Visual acuity	Snellen eye chart: Cover one eye and have patient read lowest possible line on chart. Do other eye, then both eyes together.	Patient with 20/200 vision can read print at 20 feet that a person with normal vision can read at 200 feet.
Visual fields by confrontation	• Ask patient to look with both eyes into your eyes. • Place your hands lateral to the patient's ears. • Wiggle fingers of both hands and bring fingers toward the line of gaze.	Normally, patient sees both sets of fingers at the same time.

Continued

Test	Test performance	Findings
Position and alignment of eyes	Stand in front of patient and inspect eyes for position and alignment.	Inward or outward deviation of eyes is abnormal, as is abnormal protrusion of eyes (Graves' disease).
Peripheral vision test	Hold fingers to side of patient; bring slowly from side into field of gaze.	Loss of peripheral vision can be the result of glaucoma.
Inspection of lens of eye	Using ophthalmoscope, darken the room if possible, and shine the light beam on the pupil. You should see an orange/red reflection (red reflex).	Absence of red reflex means the lens of the eye is opaque, which could be caused by cataracts.

Adapted from Dillon, P.M.: *Nursing Health Assessment: A Critical Thinking, Case Studies Approach,* 2nd ed. Philadelphia, F.A. Davis Company, 2007.

Assessment and Treatment of Metabolic Syndrome

Clinical identification of the metabolic syndrome involves any three of the risk factors in the following table.

National Cholesterol Education Program Guidelines

Risk Factor	Defining Level
Abdominal obesity* Men Women	Waist circumference** >102 cm (>40 in) >88 cm (>35 in)
Triglycerides	<150 mg/dL
HDL cholesterol Men Women	<40 mg/dL <50 mg/dL

Continued

Risk Factor	Defining Level
Blood pressure	130/85 mm Hg
Fasting glucose	110 mg/dL

*Overweight and obesity are associated with insulin resistance and the metabolic syndrome. However, the presence of abdominal obesity is more highly correlated with the metabolic risk factors than is an elevated body mass index (BMI). Therefore, the simple measure of waist circumference is recommended to identify the body weight component of the metabolic syndrome.

**Some male patients can develop multiple metabolic risk factors when the waist circumference is only marginally increased (e.g., 94–102 cm [37–39 in.]). Such patients may have a strong genetic contribution to insulin resistance. They should benefit from changes in life habits, similarly to men with categorical increases in waist circumference.

Source: U.S. Department of Health and Human Services; found at http://aspe.hhs.gov/health/prevention/.

Cranial Nerve Assessment

Nerve	Type	Name	Function	Assessment Test
I	Sensory	Olfactory	Smell	Ask patient to identify familiar smells (lemon, coffee, peppermint).
II	Sensory	Optic	Visual acuity Visual field	Assess visual acuity using Snellen chart. Assess peripheral vision.
III	Motor	Oculomotor	Pupillary reaction	Assess pupils for equality and reactivity to light.
IV	Motor	Trochlear	Eye movement	Have patient follow finger with his or her eyes without moving head.
V	Sensory and motor	Trigeminal	Facial sensation Muscles of mastication	Touch the face and assess for sharp and dull sensations. Have patient hold mouth open.
IV	Motor	Abducens	Abduction of the eye	Have patient follow your finger without moving his or her eyes.

Continued

Nerve	Type	Name	Function	Assessment Test
VII	Sensory and motor	Facial	Facial expression Sense of taste	Have patient smile, wrinkle face, and puff cheeks. Ask patient to differentiate between sweet and salty taste.
VIII	Sensory	Acoustic	Hearing Balance	Snap fingers close to patient's ears. Have patient stand with feet together, arms at side, and eyes closed for 5 seconds.
IX	Sensory and motor	Glosso-pharyngeal	Swallowing and voice	Have patient swallow and then say "Ahh."
X	Sensory and motor	Vagus	Gag reflex	Use tongue depressor or swab to elicit gag reflex.
XI	Motor	Spinal accessory	Neck motion	Have patient shrug shoulders or turn head against resistance.
XII	Motor	Hypoglossal	Tongue movement and strength	Have patient stick out tongue and move it from side to side.

Patient Assessment Assumptions and Guidelines

- Provider should introduce himself or herself and welcome patient with conveyed interest and concern.
- Every provider interaction with a patient is therapeutic.
- Every patient is unique and should be evaluated as an individual.
- An established interviewing technique should be followed.
- Trust in the provider takes time to develop.
- The physical environment should be conducive to patient comfort and privacy.
- Legal and ethical parameters should be maintained, such as informed consent, privacy, and confidentiality rights.
- Effective assessment requires clear communication.
- Interactions, including verbal and physical examination, should be accomplished using language and actions matched to respect patient dignity and characteristics, such as age, mental status, education, ethnicity, culture, and religion.
- A qualified interpreter should be available if needed; a family member or caregiver may be needed in certain situations, such as in an elderly patient with some dementia, or in certain cultures.
- Nonverbal and verbal cues from the patient are critical to consider.
- Authentic listening to patient means attention, skill, and focus are on patient; only necessary interruptions should be permitted.
- Patients are often stressed when visiting a provider; adequate learning may not take place initially; written information and follow-up are required.
- The history interview is done with the patient dressed or covered and comfortably seated or in bed (if in the hospital). The patient is provided with privacy to disrobe, a gown, and adequate drapes.

Documentation Guidelines

- Record all findings in acceptable, medically descriptive terms.
- Use correct legal abbreviations.
- Use the approved process for documentation for the organization.
- Avoid recording information as guesses or slang; put diagnoses in the proper section of record, not in physical examination section where descriptions of findings are recorded.
- Avoid making any disrespectful notations; all documentation is part of the legal record.

- If patient's own words are to be used as part of record, put them in quotation marks.
- Code accurately (see Tab 5, Coding and Billing).

SOAP Method

The SOAP method provides consistency and ease of critically evaluating each problem or reason for visit. Problems should be numbered. One SOAP entry for each numbered problem is indicated.

- **S–Subjective data:** Includes CC, HPI, relevant PMH, FH, PSH, medications, relevant ROS, and other relevant historical data
- **O–Objective data:** Includes all physical assessment data and any lab results
- **A–Assessment:** Includes diagnosis(es)
- **P–Plan:** Includes nonpharmacotherapeutic, pharmacotherapeutic, education, and plan for follow-up/monitoring/evaluation of therapy outcomes

Health History

Clinical Pearl: The health history records subjective data. It is important whether the visit is an annual or episodic exam. By the end of the history portion of the exam, the provider should have a good idea of the health-related problems or diseases you patient has. Take your time with the health history, be thorough, seek confirmation, and let the patient know you are interested in what he or she is saying.

Identifying Data

Also called demographic/biographic data.

- Record the following:
  - Name
  - Age
  - Place/date of birth
  - Nationality
  - Gender
  - Race/ethnicity
  - Religion
  - Marital status
  - Address (and alternates); phone (and alternates)

- Educational level
- Occupation
- Any required legal/insurance information, such as Social Security Number
- Person(s) for emergency notification, advance directives
- Recheck data collected by clerk with patient for accuracy.

Source of Referral and Reliability of Person Giving History

- Note both. Report may need to be requested from referring provider.
- Reliability of patient may be in question; if family member or caregiver present, note that person's presence and reliability.

Clinical Pearl: When obtaining a history from a person who does not speak English, it is important to have an interpreter who can provide information about the patient. If the interpreter is a family member, there may be change to information the patient is not willing to share with the person translating.

Chief Complaint or Reason for Visit (RFV)

- Record short statement in patient's own words of symptoms or reasons for seeking care; note complaint in a time frame (for example, CC: Chest pain for 2 hours with nausea and vomiting for last hour; RFV: I need a routine woman's health exam and Pap).
- Use caregiver's words if patient is unable to participate in assessment.
- CC is not a diagnosis; it is the main symptom/sign or complaint of the patient.

History of Present Illness or Current Health Status

- Record in narrative form:
  - Usual state of health
  - Chronological development of chief complaint (CC)
    - See PQRSTOA table on pages 27 and 28 in *Tab 1: Screening* for guidance in gathering data related to patient's signs and symptoms
  - Other pertinent data for HPI, including:
    - Past occurrences
    - Others in family with problem
    - Relevant personal history, such as mild MI 5 years ago

- Relevant family history, such as father died at age 56 of MI
- Disability

- Significant negatives related to symptoms and signs, such as no history of heart disease, HTN, respiratory illness

Clinical Pearl: The HPI extracts relevant data from the ROS. Include relevant medications, habits, and allergies. If the patient is having a routine checkup, record information on state of health since last visit, any important findings from last examinations and test results, relevant medications, and significant negatives for visit.

Past Medical History (PMH) or Past Health Status (PHS)

- Medical, surgical, OB/GYN, psychiatric past history with dates/places, such as hospitalizations, serious illnesses, surgeries, accidents and injuries, and pregnancies, including delivery outcomes, and gestation lengths
- Immunizations and dates
- Screening tests, dates, places, and results
- Recent travel, including where and why

Medications and Therapies

Clinical Pearl: During the health history it is important to ask what over-the-counter medications or supplements patients are taking. Some time may be required to obtain a complete answer because patients often don't consider things such as aspirin, vitamins, minerals, or herbal supplements to be important or they may be unwilling to tell their health-care provider about these products.

Clinical Pearl: Polypharmacy is especially problematic for older adults and may account for cognitive problems or other presenting symptoms. Be sure to ask patients to bring all medications in their appropriate bottles to the visit. Then a complete list of medications can be established, and the provider can determine if medications are being taken appropriately.

- Dosages, frequencies, routes of administration, and side effects of all current medications, including over-the-counter and prescription medications, contraceptives, herbs, and supplements
- Current therapies, including complementary and alternative therapies, such as acupuncture, hypnosis, and therapeutic touch

Allergies

- All allergies, known causes, and responses to allergies, such as dyspnea, swelling, hives, itching, erythema
- All sensitivities (rather than allergies) to drugs or other substances

Family History

- List or diagram of all grandparents, parents, and siblings with ages and health or illnesses or, if dead, age deceased and cause of death
- Specific diseases within family

Personal/Social History*

*Also called psychosocial and personal/spiritual history

- Cultural and ethnic values and health beliefs
- Living environment and safety
- Family and household members' relationships, roles, and support persons
- Violence and abuse issues
- Occupation and risks to health
- Economic situation
- Nutritional habits
- Use of tobacco, alcohol, and other substances with potential for abuse
- Exercise and physical activity patterns
- Health habits and patterns of care
- Education, including how patient learns best
- Recreation, relaxation, and hobbies
- Stress and coping methods
- Sleep and rest pattern
- Daily profile
- Seatbelt use
- Helmet use
- Goggles and other protective equipment use

Sexual History

- May be recorded separately or with personal/social history; questions dependent on specific patient
- Includes sexual preference, activity, contacts, function, satisfaction, concerns, issues, and abuse

Violence History

- May be recorded separately or with personal/social history
- Includes description of abuse or violence patterns in patient's life, physical and psychological sequelae, and measures being taken to be safe

Reproductive/Gynecologic History

- For women (describe here, in PMH, or in ROS):
  - Date of last menstrual period (LMP)
  - Date of previous menstrual period (PMP)
  - Age at menarche
  - Pattern of menstrual periods, including frequency, first day of one to first day of next, duration, characteristics of flow, bleeding between periods
  - Number of pregnancies
  - Number of deliveries
  - Number of abortions, including spontaneous and induced
  - Complications of pregnancies
  - Methods of contraception, including problems
  - Condom use
  - Age of menopause, symptoms, postmenopausal bleeding
  - Exposure to DES if born before 1971
  - History of exposure to STDs/HIV/AIDS and treatments
  - For men, see ROS genitalia

Review of Systems

Guidelines

- Record in an orderly process what the patient tells you about presence or absence of specific diseases or symptoms and signs common to each major body system. Make a note of all pertinent positive and negative statements regarding a symptom or problems.
- Organize from head to extremities.
- Request "yes" or "no" answers; for "yes" answers, ask direct questions for more information.
- Do not repeat questions asked in prior sections except for clarification.
- Questions for ROS may be asked during physical examination if necessary.

General

- Usual health state
- Usual weight and height
- Changes in weight, height, clothing fit
- Fever, sweats, chills, malaise, weakness, fatigue
- Change in exercise tolerance and ability to carry out activities of daily living (ADLs)

Integumentary

- Rashes, sores, lumps, itching, hives, dryness, flaking
- Changes in skin moisture
- Skin color, hair texture, nail texture, nail appearance
- Use of hair dye
- Excessive loss or growth of hair, care practices
- History of skin disorders

Head, Eyes, Ears, Nose, and Throat

- **Head:** Dizziness, fainting, lightheadedness, headaches, pain, head injury/sequelae, stroke
- **Eyes:** Use of corrective glasses/contact lenses, current vision, vision changes, last vision examination/results, injuries, excessive tearing, redness, discharge, infections, double/blurred vision, spots, specks, flashing lights, glaucoma, cataracts
- **Ears:** Hearing acuity/impairment, hearing aid use/effectiveness, tinnitus, vertigo, discharge, pain, earaches, infections, diseases
- **Nose/Sinuses:** Frequent colds, nosebleeds, stuffiness, discharge, itching, obstruction, injury, seasonal problems/allergies, sinus infections, postnasal drip, sense of smell

Clinical Pearl: Blood when blowing the nose is not cause for alarm in most cases but rather is caused by the breaking of small capillaries in the nasal passages.

- **Mouth/Throat:** Teeth/gums condition, sores/ulcers/bleeding gums, last dental exam/results, frequent sore throat, burning/soreness of tongue, dry mouth, voice changes, hoarseness

Neck

- Lumps
- "Swollen glands"
- Goiter or growth on neck
- Pain/tenderness
- Stiffness
- Thyroid disorder

Chest

- Cough
- Sputum production, including quantity, appearance, color
- Coughing up blood
- Shortness of breath, wheezing, history of asthma, tuberculosis, pleurisy, bronchitis, emphysema, or pneumonia
- Last TB test and results
- Last chest x-ray and results
- History of Bacille Calmette-Guérin (BCG) vaccination
- Current and history of smoking, tobacco use and plan to quit

Breasts/Axillae

- Lumps, thickening, pain or tenderness, skin changes
- Nipple discharge and color
- Self-examination
- Last provider examination
- Last mammogram or ultrasound and results
- Breastfeeding history

Cardiovascular

- Chest pain
- Heart disease
- High blood pressure
- Palpitations, irregular heart rate
- Cyanosis
- Shortness of breath with exertion/lying flat/sleeping
- History of rheumatic fever or heart murmur
- Last electrocardiogram or other heart test

Peripheral Vascular

- Pain or cramps in legs, calves, thighs, hips when walking
- Varicose veins
- Edema
- Thrombophlebits/phlebitis
- Color or temperature changes of extremities
- Hair loss on legs
- Ulcers

Gastrointestinal

- Appetite
- Swallowing difficulty
- Excessive hunger or thirst
- Excessive belching or passing gas
- Heartburn, reflux, nausea, vomiting, cough
- Distention, constipation, diarrhea, abdominal pain
- Changes in stool color, amount, consistency, frequency
- Rectal bleeding, tarry stools, hemorrhoids
- Laxative or antacid use
- Rectal pain, pain with defecation
- Jaundice, liver disease, hepatitis
- Gall bladder disease
- History of abdominal x-rays or scans and results

Urinary

- Frequency, urgency, incontinence, retention
- Difficulty beginning or maintaining urine stream
- Change in force of stream
- Polyuria, nocturia
- Burning or painful urination
- Hematuria, infections, stones
- Kidney or flank pain
- Bed-wetting, dribbling
- Change in urine color or odor

Clinical Pearl: Unexplained hematuria without pain, not caused by a kidney stone, is a cause for alarm and should be investigated because bladder cancer is the most common cause.

Male Genitalia

- Penile sores, ulcers, vesicles, discharge
- Scrotal masses, pain, edema
- Hernias
- History of or exposure to STDs, HIV, or AIDS
- Fertility problems
- Erection problems
- Prostate disorders
- Sexual satisfaction
- High-risk sexual behaviors, such as multiple partners, unprotected intercourse
- Methods of birth control, condom use

Clinical Pearl: Urinary tract infections in men are rare and often indicate a serious underlying problem.

Female Genitalia*

*Also see Sexual History and Reproductive/Gynecologic

- Lesions, itching, discharge
- Date of last Papanicolaou (Pap) smear or HPV test and results
- Dyspareunia
- Frequency of intercourse
- Fertility issues
- Hernias
- High-risk sexual behaviors, such as multiple partners, unprotected intercourse
- Menstrual pain or dysmenorrhea and treatment

Clinical Pearl: Female premenopausal patients with abdominal or pelvic pain should always be assessed for pregnancy. Tubal pregnancy is a commonly missed life-threatening problem.

Musculoskeletal

- Weakness, pain, stiffness, redness, swelling, cramps
- Neck or back problems
- Limitation of movement
- Arthritis

- Gout
- Deformities

Neurologic/Psychiatric

- Fainting, dizziness, vertigo, blackouts
- Seizures, paralysis, headaches, stroke
- Numbness, tingling, burning
- Tremors or other involuntary movements
- Loss of memory
- Changes in attention, mood, speech, gait, behavior, judgment, insight, or orientation
- Nervousness, depression, anxiety, suicide attempt, hallucinations

Hematologic/Immune

- Blood type
- History of anemia
- Easy bruising/bleeding
- History of transfusions/reactions
- Allergies
- Unexplained infections
- Node enlargement

Endocrine

- Weight/height changes unexplained
- Thyroid disorder
- Intolerance to heat or cold
- Excessive sweating, thirst, hunger, urination
- Change in glove size/shoe size/facial structure
- Excessive changes in skin/hair

Comprehensive Physical Examination

Unlike the objective information you receive when taking a patient's history, the physical examination provides concrete, subjective information.

45

Overview and Systematic Approach

- Explain examination process and procedures to patient; answer questions.
- Ensure that patient has voided prior to examination.
- Provide privacy, gown/draping, comfortable environment.
- Apply measures to prevent infection, including clean hands and universal precautions.
- Conduct examination in head-to-toe approach, unless other approach indicated based on age or physical and mental status of patient.
- Use system assessment approach if a focus on specific system is indicated; may need to begin with obvious problem.
- Provide abbreviated, focused examination for episodic or some routine examinations.
- Save genital and rectal examinations until last in most circumstances.
- Observe patient for signs of discomfort or pain; provide comfort as indicated.
- Apply techniques of examination in order of **inspection, palpation, percussion, and auscultation** accurately for each system or region; exception is abdominal examination, in which the order is inspection, auscultation, percussion, and palpation.
- Ensure that equipment and materials needed are in place, operational, and used appropriately.
- Offer patient relaxation suggestions, such as breathing and imagery, during the examination.
- Provide anticipatory advice and information during examination.
- Avoid facial expressions and comments that may convey negative thoughts.
- Look, listen, and touch with care; the senses and ability of the provider to think critically are the most valuable assets to the assessment process.
- Compare right and left body systems/sides for similarity.
- Be gentle and respectful in physical contacts.

Equipment

- Thermometer (oral, tympanic, rectal)
- Sphygmomanometer with varying cuff sizes
- Gloves (nonlatex)
- Water-soluble lubricating gel
- Tongue blades, applicator sticks, cotton-tipped applicators (large/small)

ASSESS

- Gauze pads
- Stethoscope (cardiac level)
- Oto-ophthalmoscope with nasal/ear specula
- Penlight
- Reflex hammer
- Tuning forks (128 Hz and 512 Hz)
- Safety pins or box of straight pens (use once each and discard)
- Tape measure
- Pocket visual acuity card
- Occult blood card
- Vaginal specula and associated materials for tests
- Accurate scale to measure height and weight
- Other equipment indicated, depending on history and physical examination

General Survey

- **State of health:** Look at patient for general appearance of health or ill health; listen and look for subtle clues before touching patient.
- **Height and weight, habitus:** Obtain height, weight, BMI, nutritional status; note body build, posture, and symmetry of body parts.
- **Sexual development:** Note whether level of sexual development is appropriate for age/race/gender.
- **Motor activity and gait:** Observe for abnormalities with walking, sitting, and moving during examination.
- **Personal characteristics:** Note appropriateness of dress, grooming, and hygiene and any abnormal odors.
- **Emotional state:** Observe reactions, facial expressions, manner, and affect.
- **Awareness/consciousness:** Note level of alertness, words, and speech.

Vital Signs

See table for examples of normal vital signs by age group and the appropriate physical assessment reference for in-depth information.

Temperature

- Use correct route, device, and application for safety and accuracy of findings; consider patient age, mental status, and condition.
- Temperatures fall during sleep and are lowest between 2:00 a.m. and 4:00 a.m.; they rise during the day to peak between 6:00 p.m. and 10:00 p.m.

- Routes are tympanic, oral, rectal, and axillary.
- Body temperature in infants and young children is higher until age 3 years; children's temperature fluctuates in a day up to 3°F, even to 100.8/9°F.
- Older men have lower oral temperatures compared with older women.

Heart Rate/Pulse

- Obtain initial radial or apical pulse for 1 minute; recheck character of heart and pulse, including rate, rhythm, and volume/intensity, when conducting cardiovascular or peripheral vascular examination.
- Heart rate is higher normally in infants and children.

Respiratory Rate

- Observe or obtain initial respiratory rate for 1 minute; recheck with respiratory examination.
- Respiratory rate in infants and children has greater range.

Blood Pressure

- Obtain initial BP using accepted method, such as removing all clothing, correct sphygmomanometer cuff placed smoothly around upper arm, arm at level of heart on arm rest, stethoscope applied over brachial artery at elbow below cuff, pressure inflated above systolic pressure in brachial artery, released slowly at about 1 mm Hg/sec.
- Listen for all Korotkoff sounds and record first (systolic) and last (diastolic), even if muffled. Consider that patients with hypertension may have an auscultatory gap.
- Record the exact numbers heard and note patient position; recheck BP in supine and sitting positions in both arms (and legs if indicated) if elevated.
- Consider patient-altering conditions when taking and documenting vital signs:
  - Patient arriving late for appointment, making him or her hurried or anxious
  - Patient smoking a cigarette or drinking hot or cold drink within the previous 30 minutes
  - Patient taking medication 20 minutes before arriving
  - Examination room being too hot or cold

Examples of Vital Sign Ranges by Age

Vital Sign	Infant (3 mo–1 year)	Child (3–5 years)	Child (9–13 years)	Adolescent (14–18 years)	Adult (19–55 years)	Elder (55 years and older)
Temperature (°F)						
Oral	99.4–99.7	99.0–98.6	98.1–97.8	98.1–97.8	98.6–100.6	95–97
Rectal or tympanic	99.0–101	99.0–101	99.0–101	99.0–101	99.0–100	99.0–101
Axillary	96.6–98.6	96.6–98.6	96.6–98.6	96.6–98.6	96.6–98.6	96.6–98.6
Heart/pulse rate (resting) (beats/min)	(Older baby–toddler) 75–160	60–138	65–125	55–115	60–100	60–100
Respiratory rate (resting) (breaths/min)	(Older baby–toddler) 20–40	(Age 3) 20–30	(Age 10) 16–20	(Age 14) 14–20	12–20	12–20
Blood pressure (mm Hg)						
Systolic	75–115	103–112	111–119	120–139	120–139	120–139
Diastolic	52–56	65–70	73–78	76–82	80–90	80–90

Integumentary System

- Inspect and palpate skin on face and other body systems during examination for color or discolorations, lesions, temperature, moisture, and turgor.
- Note excessive growth or loss of hair, tattoos, piercings, and scars.
- Inspect for primary and secondary lesions.
- Evaluate lesions for:
  - **(A)** Asymmetry of shape
  - **(B)** Border irregularity
  - **(C)** Color variation
  - **(D)** Diameter >6 mm
- Note type, location, distribution, and arrangement of lesions.
- Inspect hair for color, use of dyes, texture, consistency, areas of loss or excess growth, and parasites.
- Inspect fingernails and toenails for signs of disease, such as Beau's lines, clubbing, koilonychias; inspect artificial nails for signs of infection.

Head, Eyes, Ears, Nose and Sinuses, and Throat

- **Head:** Inspect and palpate scalp, skull, temporomandibular joints, and face and facial structure for lesions, pain or tenderness, symmetry; note position and size of head.
- **Eyes**
  - Inspect symmetry and alignment of eyes.
  - Inspect bilateral eyelids, sclera, conjunctiva, cornea, and iris.
  - Screen for visual acuity, visual fields, and extraocular movements.
  - Inspect pupillary size and compare.
  - Test papillary reaction to light, both direct and indirect, and convergence/accommodation.
  - Inspect anterior chamber, lens, and retinal or ocular fundi with ophthalmoscope.
  - See "Funduscopic Items to Check" on page 50.
- **Ears**
  - Inspect and palpate outer ear.
  - Check auditory acuity/Weber's/Rinne.
  - With otoscope, assess ear canal, TM, and visible structures behind TM.

- **Nose**
  - Assess sense of smell for each nostril separately.
  - Inspect external nose structure.
  - With nasal speculum and light, inspect nasal mucosa, septum, and turbinates.
  - **Sinuses:** Palpate frontal and maxillary sinuses for tenderness.
- **Mouth and Throat**
  - Inspect mouth and throat for lesions and discolorations
  - With gloves, palpate accessible mucosa; inspect for dental caries, missing teeth, and appliances.
  - Assess swallowing.

Funduscopic Items to Check: Examples of Abnormalities

- **Red reflex:** Absence indicating cataract or other abnormality
- **Optic disc/cup:** Papilledema, abnormal color or size
- **Veins:** No pulsations
- **Arteries:** Narrowing, copper wire or silver wire appearance
- **Arteriovenous crossing:** Nicking, tapering, banking
- **Retina:** Hemorrhage, aneurysm, new vascularization, abnormal color, drusen bodies, exudates, cotton-wool patches
- **Neck**
  - Inspect and palpate trachea for alignment.
  - Inspect jugular veins for distention or masses, neck for full ROM.
  - Inspect and palpate sternocleidomastoid and trapezius muscles for tenderness or abnormality.
  - Inspect and palpate lymph nodes of the face and neck for enlargement, pain or tenderness, irregularity of shape, or hardness. Include occipital, preauricular, postauricular, tonsillar, submaxillary, submental, posterior cervical, anterior cervical, deep cervical, supraclavicular, and infraclavicular nodes.
  - Inspect and palpate thyroid gland at rest and with swallowing for nodules or enlargement.
  - Palpate and auscultate carotid arteries for pulse characteristics and bruits.

Posterior Thorax and Lungs

- Inspect anterior-to-posterior diameter of chest and configuration of the chest for abnormality. Compare with transverse diameter (1:2 ratio).
- Assess respiratory rate, pattern, effort, posture, and impairment.

- Inspect and palpate back for spinal alignment, symmetry of muscles and bony structures, tenderness, and abnormalities.
- Palpate and percuss posterior chest; note increased fremitus over any area. Note level of diaphragm with and without excursion. Auscultate all lobes for normal and adventitious (abnormal) breath sounds; listen to transmitted voice sounds if abnormal sounds heard.

Percussion Notes and Examples of Locations

- **Resonance:** Fairly loud, long, medium-pitched sound heard over normal lung
- **Hyperresonance:** Very loud, longer than resonance, lower-pitched sound not heard normally; heard over lung with abnormality such as emphysema or pneumothorax
- **Tympany:** Loud, variable duration, often high-pitched sound heard over gastric bubble (normal) or pneumothorax (abnormal)
- **Dullness:** Moderate intensity, duration, and pitched sound heard over liver (normal) and lung (abnormal)
- **Flatness:** Soft-intensity, short-lived, high-pitched sound heard over bone (normal)

Abnormal Breathing Characteristics

- **Bradypnea:** Slow, regular breathing seen with depressed respirations from drug, diabetic coma, or intracranial pressure increase
- **Tachypnea:** Fast, shallow breathing resulting from causes such as chest pain from pleurisy, lung disease causing restriction to breathing, and pressure under diaphragm elevating it and decreasing lung expansion
- **Cheyne-Stokes:** Apnea alternating with deep breathing seen with heart failure, brain damage, and many other causes but also seen normally in children and elderly
- **Hyperpnea (hyperventilation):** Fast, deep breathing seen with anxiety or exertion; may be fast or slow in metabolic acidosis; called Kussmaul breathing
- **Biot's (ataxic):** Irregular breathing that is unpredictable in pattern; may be deep, shallow, stopped, or rapid; seen with brain damage
- **Sighing:** May be normal if breathing interrupted by sighs but also may relate to dyspnea, dizziness, or hyperventilation
- **Obstructive:** Expiratory phase prolonged; difficult because of narrowing of airways; seen with COPD, asthma, and chronic bronchitis

Normal, Adventitious (Added), and Altered Breath/Voice Sounds

- **Vesicular:** Soft-intensity expiratory sound that has longer inspiration and is moderately low pitched; heard over most normal lungs

- **Bronchovesicular:** Intermediate-intensity expiratory sound of moderate pitch level equal in length with inspiration; heard between scapulae and over interspaces 1 and 2 on anterior chest; not heard normally away from locations mentioned
- **Tracheal:** Loud expiratory-intensity sound of fairly high pitch that lasts longer than inspiration; might be heard over manubrium; may not be heard
- **Bronchial:** Quite loud expiratory sounds of fairly high pitch and equal to inspirations in length; heard over trachea; not heard normally away from location mentioned
- **Crackles (rales)**
  - Heard discontinuously and intermittently; musical and brief
  - May be fine (soft, very brief, high pitched) versus coarse (louder, lower pitched, brief)
  - Described as fine or coarse "dots," like hair rolled between thumb and finger
  - Heard in lung abnormalities such as pneumonia
- **Wheezes/rhonchi**
  - Heard continuously for some part of respiratory cycle
  - Described as musical, prolonged
  - More high-pitched shrill, squeaky hisses not relieved by coughing (wheezes)
  - Lower-pitched, harsh, loud snores (rhonchi)
  - Heard best over bronchi/trachea during expiration
  - Relieved by coughing at times
  - Heard in diseases such as asthma, bronchitis, and congestive heart failure
- **Stridor**
  - Heard without stethoscope as a harsh, high-pitched wheeze
  - Heard with partial tracheal or laryngeal obstruction/narrowing
  - Indicates need for immediate intervention
- **Absent or diminished:** Lung sounds normal only on one side; heard with pneumothorax, pneumonectomy, and other causes of no lung function on one side
- **Pleural rub:** Heard as grating, creaking continuous or discontinuous sound from friction of rough, inflamed pleural surfaces rubbing against each with breathing
- **Egophony:** "ee" when spoken changing to "ay" if no air in lobe
- **Bronchophony:** Words spoken being clearer and louder if no air in lobe
- **Whispered pectoriloquy:** Words whispered being clearer and louder if no air in lobe

Anterior Thorax and Lungs

- Inspect and palpate anterior chest for breathing pattern, fremitus, muscle and bone structure symmetry, or tenderness.
- Percuss and auscultate anterior lung fields for abnormal breath sound. Reminder: Right middle lobe can only be assessed from right anterior or lateral chest. Listen above the clavicles to the very upper aspects of the lungs. Breasts or obesity may muffle sounds.

Breasts, Axillae, and Epitrochlear Nodes

- Inspect female breasts with patient's arms at sides and above head and with hands pressed on hips for size, asymmetry, masses, skin discolorations, dimpling, retraction, venous pattern abnormities, or lesions. Inspect male breasts seated or supine for enlargement also.
- Inspect axillae for skin discoloration, masses, swelling, or lesions.
- Palpate axillae for enlarged/hard/irregular nodes or tenderness (specifically the central, pectoral [anterior], lateral, and subscapular groups of nodes). Check supraclavicular and infraclavicular nodes if not checked with examination of the neck.
- Palpate each breast, areola, and nipple with patient supine with arms over head and small pillow under back on side being examined for tenderness, masses, nodules, or thickened areas. Gently compress nipples and note color, consistency, and amount of any discharge. With large, pendulous breasts, palpate with patient sitting, then supine.
- Note specific location, size, shape, consistency, tenderness, and mobility of any nodule or mass.

Heart

- With patient supine at 30 degrees, inspect and palpate the precordium at 2nd right and left interspaces and apical impulse (PMI) at apex (generally midclavicular line 5th left intercostal space), noting characteristics of impulse, including location, duration, diameter, and amplitude. If PMI not felt, assess with patient on left side partly in the left lateral decubitus position.
- Auscultate systole or S1 and diastole or S2 at mitral, tricuspid, aortic, and pulmonic listening areas with bell, then diaphragm.
- Look and listen for S3 and S4.
- Listen at apex with patient in sitting position, leaning forward for extra sounds.

ASSESS

- Note characteristics of all sounds heard in systole and diastole for abnormalities; grade murmurs based on timing, shape, maximal intensity location, radiation, and intensity as fraction.

Murmur Grading

- **Grade 1 (1/6):** Very difficult to hear; not usually heard in every listening position
- **Grade 2 (2/6):** Heard when stethoscope placed on chest but not loud
- **Grade 3 (3/6):** Moderate loudness
- **Grade 4 (4/6):** Loud; thrill present
- **Grade 5 (5/6):** Quite loud; heard with stethoscope off chest partly; thrill present
- **Grade 6 (6/6):** Quite loud; heard without stethoscope on chest; thrill present

Assessing Jugular Venous Pressure

- Assess if indicated by history and prior findings of physical examination, such as abnormal carotid pulsations or bruits, and abnormal heart examination findings.
- Internal jugular veins lie between carotid arteries and sternocleidomastoid muscles bilaterally. Pulsations undulate, reflecting right atrial pressure changes, dynamics of blood volume pressures, and heart function.

Clinical Pearl: Distinguish from carotid artery pulsations, which are palpable, have more intense pulsations that are not changed by position changes or inspiration, and reflect systolic and diastolic pressure changes, particularly ventricular effects.

- Raise examination table or bed to 30 degrees. A small pillow under the head is acceptable. To focus on internal jugular venous pulsations, may need to lower or raise head; the change in height will not affect the findings.
- Use tangential lighting to see pulsations, and ask patient to turn head the opposite way.
- Inspect both sides of the neck to find external and internal jugular pulsations. Find peak of pulsations of internal jugular artery; place long straight card or object in horizontal position from pulsation's highest point so that it crosses a vertical ruler placed from the sternal angle to form a right angle.
- Measure the distance in centimeters from the sternal angle (reflect pressure in right atrium) to where the horizontal card or object crosses the ruler.

- Repeat on opposite side and record left JVP and right JVP measurements.
- Abnormal JVP is more than 4 cm above the sternal angle.

Peripheral Vascular Assessment*

- Inspect all extremities completely: fingertips to shoulders for arm; ends of toes to groin and buttocks. Compare one side to the other.
- Inspect and palpate for size, edema (note severity of slight to excessive pitting on 4-point scale), symmetry, venous pattern/enlargement/varicosities, skin texture, temperature (with backs of hands), color/discoloration, pigment changes, lesions, and hair patterns, particularly on lower extremities.
- Palpate and compare pulses: radial, brachial, femoral, popliteal, dorsalis pedis, and posterior tibial.
- Grade pulse amplitudes as 0 (absent, nonpalpable), 1+ (weak, diminished), 2+ (brisk), 3+ (increased), or 4+ (bounding). Record grade for each pulse.
- Inspect/palpate right and left epitrochlear nodes and superficial inguinal nodes (horizontal and vertical) for size, tenderness, consistency, discreteness, and mobility.
- Auscultate for bruits with bell over aorta and iliac and femoral arteries.

*May be done with abdominal, musculoskeletal, or neurologic examination.

Abdomen

- Inspect abdominal skin for color, lesions, scars, striae, venous pattern; inspect umbilicus for signs of infection or hernia.
- Know, in your mind's eye, the normal location of all abdominal organs in left and right upper and lower quadrants and central abdomen from epigastrium to symphysis pubis. Inspect abdominal contour for symmetry, visible organs or masses, peristaltic waves, and pulsations. Note if contour is flat, round, protuberant, excessively concave or hollow (scaphoid), or local or flank bulges. Ask patient to lift head up slightly; note diastasis recti.
- Auscultate bowel sounds with diaphragm (normally 5–34 clicks/gurgles/minute). Listening in one quadrant only is acceptable because of sound transmission efficiency in abdomen. If abnormality suspected, listen in all quadrants carefully.
- Auscultate aorta, renal arteries, iliac arteries, and femoral arteries for bruits. Auscultate upper middle abdomen (epigastrium) for venous hum.
- Percuss upper and lower borders of liver at RMCL; tympany becomes dullness at lower border; resonance becomes dullness at upper border.

Measure distance between borders in centimeters (normal 6–12 cm at MCL; 4–8 cm immediate left of sternal border).

- Percuss for splenic enlargement by finding and percussing over left lowest interspace in left anterior axillary line; when patient is asked to take a deep breath, percussion note changes from tympany before the breath to dullness during the breath, indicating the spleen may be enlarged.
- Percuss entire abdomen for tympany (gas) and dullness (masses/fluid/feces); note any tenderness with percussion. Note dullness level of distended bladder above symphysis pubis.
- Palpate **first** with light palpation over abdomen to find tenderness, any masses/organs near the surface, or resistance of the musculature.
- Palpate **second** with deep palpation systematically in all quadrants for masses and characteristics, tenderness (note rebound tenderness if present), and pulsations.
- Palpate liver border for consistency, irregularity, contour, and tenderness; normally liver edge is smooth, regular, and not hard or firm. With an abdominal deep breath, the liver falls about 3 cm below costal margin for better evaluation.
- Strike flat hand resting on lower right rib cage with ulnar side of other hand to assess for tenderness, which may indicate hepatitis or congestion; compare with left side (should be absent).
- Palpate kidneys bilaterally for size (enlargement), contour (masses, irregularity), and tenderness. It is rare to palpate normal left kidney; normal right kidney may be palpable if person is thin and relaxed.
- Strike ball of one hand over each CVA with ulnar fist of other hand to assess for kidney tenderness. Normally, no pain is elicited.
- Palpate aortic pulsations in upper abdomen; assess width of aorta if possible. Normal aorta is not wider than 3 cm.

Musculoskeletal System*

- Inspect and palpate joints of upper extremities for swelling, tenderness, warmth, redness, deformities, nodules, and thickenings:
  - Shoulder/clavicle/scapula (glenohumeral, sternoclavicular, acromioclavicular) joints
  - Elbow formed from humeroulnar, radioulnar, and radiohumeral joints
  - Wrist joint formed from radiocarpal, distal radioulnar, and intercarpal joints
  - Hand/finger joints consist of metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints

- Inspect and palpate muscles, bursae, ligaments, tendons, capsules, and surrounding tissues of upper extremities for crepitus, atrophy, nodules, swelling, tenderness, or bruising. Compare sides.
- Test ROM for upper body and upper extremeties:
  - **Neck:** Flexion, extension, rotation, lateral bending
  - **Shoulders:** Abduction, adduction, flexion, extension, internal and external rotation
  - **Elbow:** Flexion, extension, pronation, supination
  - **Wrists:** Flexion, extension, ulnar deviation, radial deviation, grip
  - **Fingers/thumbs:** Flexion, extension, abduction, adduction; opposition for the thumbs
- Inspect posture, movement, and gait with walking from and to provider. Note width of base, pelvic shift, knee flexion, smoothness and continuousness of rhythm. Note stance and cycle of weight-bearing foot and swing of foot that is not weight-bearing.
- Inspect spine and hips from side and behind with patient standing. Inspect curves of cervical, thoracic, and lumbar spine; alignment of spinal processes; and alignment of shoulders and scapulae. Inspect paravertebral muscles, hip surfaces, and condition of skin over back and hips for abnormalities.
- Palpate spinous processes, joints, and paravertebral muscles from neck, down spine, and through sacroiliac joints for tenderness, spasm, or obvious lack of or too prominent spinal process.
- Test ROM of spine, including flexion, extension, rotation, and lateral bending; and hips, including flexion, extension, abduction, adduction, and internal and external rotation. Spinal ROM tested while standing; hips ROM tested while standing or supine.
- Inspect and palpate joints of lower extremities for alignment, swelling, tenderness, warmth, redness, deformities, nodules, thickenings, or atrophy:
  - **Hip joint:** Where the femoral head inserts into the acetabulum
  - **Knee:** Tibiofemoral and patellofemoral joints, trochlear groove
  - **Ankle:** Tibiotalar, subtalar joints
  - **Foot:** Metatarsophalangeal forefoot joints, proximal and distal interphalangeal toe joints
- Inspect and palpate muscles, bursae, ligaments, tendons, capsules, menisci, surrounding tissues of lower extremities for crepitus, atrophy, nodules, swelling, tenderness, thickening, bogginess, or bruising. Compare sides.
- Test ROM of knee for flexion and extension, ankle for plantar flexion and dorsiflexion, and foot for inversion and eversion.

ASSESS

*Temporomandibular joint and masseter muscle assessment done with HEENT; range of motion and evaluation of spine and gait often completed at beginning of examination or very end. See Nervous System, page 58, for motor and strength assessment.

Nervous System

Mental Status/Behavior

Some Assumptions

- Some assessment of the patient's mental status occurred from first meeting the patient, conducting the interview to gather history data, and performing the physical examination to this point.
- The general survey provided specific data that applied to the nervous system evaluation of the mental status and gave indication for further assessment.
- An in-depth evaluation of the mental status does require specific questions and activities that seek specific indications of normalcy or deviations.
- If the provider has concerns that a more in-depth assessment is needed for mental status, the next sections would be indicated. More detailed information about these sections may be accessed in a reputable health assessment text.

Appearance/Behavior

- **Consciousness:** Patient is alert, awake, aware of and understands questions, responds appropriately within an acceptable period of time, and stays on track.
- **Dress, grooming, body and clothing hygiene:** Dress and appearance are appropriate for the person's situation, age, and sociocultural background; clothing is clean, in good condition, right-side out, and in place and fastened; skin and teeth are clean, and hair, nails, and body hair are groomed and hygienic.
- **Posture, motor activity:** Body movements and posture are evidence of patient's state of relaxation or stress or other, such as pain, and are not influenced by other activities in the area.
- **Facial expression:** Patient's expressions change in response to questions, statements, and activities of provider during examination or remain unchanged throughout process of assessment.
- **Manner, affect, relationship to others and things:** Patient's affect is appropriate to the situation, circumstances, and topics asked or

discussed; patient is open and may be approached by others; reactions are appropriate. Patient converses only with provider or other person invited to be present, does not talk to someone absent or see or hear something the provider does not see or hear.

Clinical Pearl: When an older adult presents with sudden-onset confusion, the provider should consider delirium rather than dementia. Common causes of delirium in older adults include infection, electrolyte imbalance, polypharmacy, fecal impaction, and cardiac arrhythmias.

Speech and Language

- **Quantity, rate, volume:** Patient responses and speech are spontaneous, acceptable in quantity and loudness, without excessive words.
- **Word articulation, fluency:** Spoken words are clear, distinct, and with inflections; without nasal characteristic, hesitations, substitutions for words unable to recall, or paraphasia of words.

Mood, Thoughts, and Perceptions

- **Self-perceptions of mood:** Patient responds to questions about feelings related to specific life events, current feelings and spirits, feelings of depression or discouragement, how he or she sees self in the future, and thoughts of death or suicide (if so, how it would be done and what he or she believes death is like). Assess if the patient has a plan and the means to carry out the plan to commit suicide.
- **Thought processes, content, perceptions, insights, judgment:** Patient's *thought processes* are logical, organized, relevant, understandable, coherent, and goal oriented. *Thought content* does not exhibit compulsiveness, obsessions, phobias, anxieties, feelings of unreality or depersonalizations, or delusions. *Perceptions* do not seem to be misinterpretations of reality or hallucinations. *Insight* is appropriate to questions/statements. *Judgment* and decisions/planning are realistic, not suggestive of psychosis, impairment, anxiety, low level of intelligence, or disorientation.

Cognitive Function

Rudimentary Cognitive Functions

- **Orientation:** Patient answers questions correctly related to information that can be confirmed, such as time of day, week, month, season, date, year; place of health visit, town or city, and state; own name, names of family members or others that can be verified.

- **Attention:** Patient's concentration is evidenced by correct repeating of numbers in the digit-span exercise, subtracting 7s from 100 in about 1.5 minutes, or spelling words backward.
- **Remote and recent memory:** Patient is able to give generally accurate information that can be verified, such as jobs held, anniversary, historical events and people; gives accurate information that is recent, such as time for appointment, medications, weather of the day.
- **Learning and immediate retention:** Patient is able to repeat back at the end of the examination a series of 3 to 4 words given at beginning of examination. Words are correct; patient is aware of correctness.

Higher Cognitive Functions

- **Information and vocabulary:** Patient has a higher cognitive function; able to discuss topics intelligently or answer more complex, direct questions accurately.
- **Calculating ability:** Patient is able to complete addition and multiplication correctly at simple and slightly more complex level or give correct answers to situational math problems.
- **Abstract thinking:** Patient is able to draw the face of a clock, complete with numbers, accurate size of hands, or give reasonable, nonconcrete interpretations of common proverbs, such as "a stitch in time saves nine," "the squeaky wheel gets the grease"; patient is able to say how things are alike accurately and the relevance, such as a *church* and a *theater* or a *piano* and a *violin*. The degree of abstractness or concreteness is accurate.

Clinical Pearl: Screening for cognitive impairment in older adults is important. Cognitive impairment can significantly affect the information provided by the patient, and another health-care informant may be required. In addition, cognitive impairment may affect the patient's safety at home and their ability to complete activities of daily living and may be the cause of somatic complaints.

Cranial Nerves, Motor and Sensory Systems, and Reflexes

Selected Assumptions

- Assessment of some components of the nervous system takes place during the earlier physical examination, such as cranial nerve when doing HEENT and neck.

- Assessment of motor and sensory systems and reflexes may be integrated into assessment of specific regions of the body, such as combined with peripheral vascular and musculoskeletal of the upper extremities, and so on.
- Always test and compare opposite sides of the body, such as each nostril separately for smell acuity, each eye separately and both together, each pupil separately for pupillary reactions. and feet separately for sensory function.
- Compare proximal with distal areas of the body; use nonrepetitive patterns to assess so the patient is not able to anticipate the test area.

Cranial Nerves and Motor System

- Assess cranial nerves (CN 1–12)
- Inspect and palpate motor system by observing body position at rest and during activity, inspecting for involuntary movements; inspecting and palpating muscles for size and contour, atrophy, fasciculations, maintenance of tone when muscle is relaxed, decreased resistance with passive movement by provider, spasticity and rigidity, and floppiness.
- Test coordination with:
  - Rapid alternating movements (arms, legs) for rhythm, speed, and smoothness
  - Point-to-point function (arms, legs) for smoothness, accuracy, and lack of tremor
  - Gait (walk naturally, heel-to-toe, walk on toes, walk on heels) for balance, posture, appropriate swing of arms and leg movements, and smooth turns
  - Hopping in place and shallow knee bends for position sense and balance, testing with each leg separately (may substitute standing from sitting position without using arm support and stepping up on sturdy step if patient is ill or older)
  - Testing for muscle strength (see table on page 62)
- Test stance for balance, position sense, and intact corticospinal tract with the:
  - Romberg test: Ability to maintain upright position with no support for 20 to 30 seconds after closing eyes while standing
- Test for pronator drift: Ability to keep both arms straight forward with palms up and eyes closed for 20 to 30 seconds; ability to return to prior position when provider taps arm and arm drifts only slightly

- Test and grade muscle strength for the following muscles and spinal nerve roots; see tests and method for testing below followed by grading scale for strength.

Muscle Strength Testing

Test	Spinal Root	Method for Testing
Biceps flexion	C5, 6	Ask patient to bend arm at elbow and pull lower arm up; provider offers resistance, holding lower arm near wrist.
Triceps extension	C6, 7, 8	Ask patient to bend arm at elbow and push lower arm down; provider offers resistance by holding arm near wrist.
Wrist extension	C6, 7, 8	Ask patient to make fist and not let provider push it down.
Grip	C7, 8, T1	Ask patient to squeeze provider's middle and index fingers so that provider cannot pull them out. Test both sides at once.
Finger abduction	C8, TI, ulnar nerve	Ask patient to spread fingers with palm down and not let provider push them together.
Thumb opposition	C8, T1, median nerve	Ask patient to turn hand with thumb up and palm inward and touch thumb to little finger as provider offers resistance under thumb. Provider holds wrist steady.
Spinal flexion, extension, bending		Ask patient to stand with back straight, bend to each side at waist, and bend over and try to touch his/her toes.
Hip flexion	L2, 3, 4—iliopsoas	With patient supine, ask patient to raise straight leg with provider's hand offering resistance on the thigh.

Continued

Test	Spinal Root	Method for Testing
Hip adduction	L2, 3, 4—adductors	Ask patient to bring legs together against provider's hands placed firmly on surface between patient's knees.
Hip abduction	L4, 5, S1—gluteous maximus	Ask patient to bring legs apart against provider's hands placed firmly on surface on the outside of patient's knees.
Hip extension	S1—gluteous maximus	Place hand under patient's posterior thigh, lift to offer resistance, and ask patient to push down against hand.
Knee extension	L2, 3, 4—quadriceps	Place hand under patient's knee, lift knee to flex leg; ask patient to straighten leg as provider uses other hand to press down on lower leg.
Knee flexion	L4, 5, S1, S2—hamstrings	Ask patient to flex leg with heel on table; place hand on patient's anterior lower leg right below knee for stability; ask patient to keep foot on table as provider tries to lift leg with hand around lower leg/ankle.
Ankle dorsiflexion	L4, 5	Ask patient to pull up with foot as provider holds top of foot to offer resistance.
Ankle plantar flexion	S1	Ask patient to push down with foot against provider's open hand pressing upward on bottom of foot.

Sensory System and Reflexes

- To test sensory system:
  - Sample dermatomes and peripheral nerve areas, comparing symmetric sides for sensory intactness; map areas where deficits found.
  - Avoid holding patient's hand, foot, or other body part with pressure or in way that alerts patient or interferes with test accuracy.

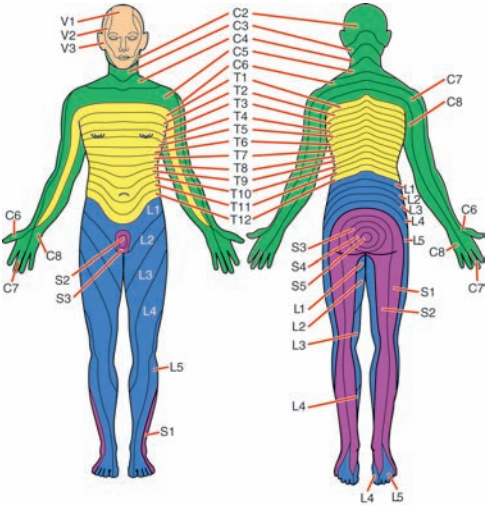
- Patient's eyes must be closed.
- Alter test site opposites irregularly during test so patient cannot anticipate sensation.

Retest any test area lacking sensation.

Test for pain with sharp, clean safety pin, broken cotton-tipped applicator, or other clean tool that has a blunt end and a sharp end.

- Test for light touch with cotton wisp swiped lightly to a sampling of areas.
- Test for vibratory sense using vibrating tuning fork (128 Hz) placed on distal joint of one finger on each hand and joint of big toe on each foot.
- Test for position sense by holding big toe lightly on each side and moving up and down in small arc.
- Test for sensory discrimination with:
  - Stereognosis: Object identification in hand
  - Graphesthesia: Number identification when drawn on palm
  - Two-point discrimination: Identifying two or one point of ends of two blunt pins or two opened paper clips applied gently to pad of one finger
  - Point localization: Asking patient to point to place lightly touched
  - Extinction: Asking patient where touch felt after touching corresponding areas on both sides of body
- Test for deep tendon reflexes with reflex hammer applied to areas identified for reflex responses in the following table. Help patient relax using reinforcement technique (isometric contraction of other muscles by clenching teeth or squeezing thigh with opposite hand) or asking patient to place fingers in locked position together and pulling away with arms horizontally.

Dermatones



Sensory System and Reflex Testing

Reflex	Nerve Root	Method to Test and Response
Biceps	C5, 6	• Patient's arm partially flexed at elbow with palm down • Provider firmly presses finger/thumb on biceps tendon and strikes finger with hammer to elicit tendon reflex • Response: elbow flexion, biceps muscle contraction

Continued

Reflex	Nerve Root	Method to Test and Response
Triceps	C6, 7	• Patient's arm partially flexed at elbow with palm facing toward body • Provider pulls arm across chest slightly and strikes with hammer above elbow on back of upper arm • Response: triceps muscle contraction, elbow extension
Brachioradialis	C5, 6	• Patient's hand resting on lap or abdomen, forearm pronated partially • With flat edge of hammer, provider strikes radius above wrist about 2 inches • Response: forearm flexion, supination
Abdominal	T8, 9, 10 (above) T10, 11, 12 (below)	• Provider strokes abdomen lightly and quickly with wooden end of cotton-tipped applicator on each side above and below umbilicus • Response: abdominal muscles contraction, umbilicus deviates toward stimulation
Knee	L2, 3, 4	• Patient's knee is flexed • Provider taps patellar tendon briskly immediately below patella • Response: quadriceps contraction, knee extension
Ankle	S1	• Provider dorsiflexes patient's foot at ankle with own hand; strikes Achilles tendon with flat of hammer • Response: plantar flexion at ankle (seen or felt)
Plantar	L5, S1	• Provider firmly strokes sole of foot laterally from heel up to ball of foot, curving across ball to medial area • Response: plantar flexion of foot, movement of toes (Babinski response indicates CNS lesion except in neonate)

Sociocultural–Spiritual Assessment

General Guidelines

- For insights into sociocultural values and beliefs related to health, illness, and health care, ask for examples of positive and negative health-care experiences.
  - *Response examples:* "I was seen quickly in that office the last time I went." "I'll never go to that doctor again—he never looked at me when he talked." "I was lying on a gurney in the ER hall for 7 hours before anyone came to help me."
- Ask what "good health" means to the patient.
  - *Response examples:* "I can do my job." "I can play sports." "I am able to enjoy being with my family." "I can clean the house, garden, and do my knitting."
- Ask what "poor health" means to the patient.
  - *Response examples:* "I have a lot of pain with my arthritis." "I can't take care of myself as well anymore." "I had to give up playing basketball."
- Learn about dominant cultural and ethnic background beliefs and values related to health care in your area. Ask what the patient feels is important for his or her own health care.
  - *Response examples:* "I want a doctor who doesn't look down on me because I go to a *señoría* for health care." "I'm African American. My family uses a lot of herbs. I wish I could talk with my health provider about that, but she thinks it's unhealthy." "Islamic culture requires a female family member to be present during my annual exam. A female provider is important too."
- Consider unique personal and cultural responses of the patient and family because they may be different for each person in a culture or ethnicity.
  - *Response examples:* "I know I've got a *castiga* [Italian for curse] on me! It must be that woman down the street who is making me sick." "In my family [Puerto Rican], we try to eat some hot and cold foods to keep well." "I don't talk with my priest to help me with this disease! He just makes me more stressed."
- Try to learn about the patient's subcultures. Recognize that people are multicultural—they may differ from their larger cultural group in

numerous areas, including religion, politics, geographic region, and socioeconomics.
  - *Response examples:* "Going to synagogue is very important to me, though my wife doesn't feel that way." "I really enjoy going to the neighborhood planning meetings, but lately I haven't been able to because of my knee pain." "I'm so distressed because my religion requires me to be clean and I'm having leakage." "I get so stressed at the political meetings for our party—I'm the secretary. People in our area are so rude."
- Learn some general information about a culture or ethnicity related to health care, but be aware that beliefs and values differ widely within groups; don't stereotype patients.
- Find out what actual ethnic or racial factors may be influencing the patient's condition, such as growth patterns or propensity for higher risks for certain diseases within the ethnic or racial group; this is different from values and beliefs. See table that follows for examples of illnesses/genetic conditions found in certain ethnic groups.
- Recognize your own values, beliefs, biases, and stereotypes; be willing to accept other cultures as equal although different. If unable to, refer the patient to someone who can care for that patient in an unbiased manner.
- Obtain effective and accurate translator support to interact effectively with a patient from another culture who does not speak your language well or at all. Use good judgment if patient insists on a family member; this may be a cultural or religious need.
- In every interaction, seek to show respect, to communicate effectively, to listen authentically, and to collaborate with the patient in his/her own care.

Examples of Ethnic Genetic/Other Health Concerns

Ethnicity	Genetic or Other Disorder
Hispanic	
• Mexican American	• Hypertension
• Costa Rican	• Malignant osteoporosis

Continued

Examples of Ethnic Genetic/Other Health Concerns—cont'd

Ethnicity	Genetic or Other Disorder
Asian/Pacific Islander	
• Chinese	• Diabetes mellitus
• Filipino	• Thalassemia
• Hawaiian (women)	• Thalassemia
Black	
• African	• Sickle cell anemia, glaucoma, hypertension • Systemic lupus erythematosus
Middle Eastern	
• Armenian	• Familial Mediterranean fever
• Iraqi	• Ichthyosis vulgaris
• Karaite Jewish	• Wefnig-Hoffmann disease
Native American	
• Navaho Indian	• Arthritis, diabetes
• Eskimo (children)	• Fetal alcohol syndrome, diabetes
White	
• Amish	• Coronary heart disease
• Appalachian	• Cystic fibrosis
• English	• Phenylketonuria
• Norwegian	

Questions for Sociocultural–Spiritual Assessment

Communication, Time, Space, Etiquette, and Learning

- How do you prefer to be addressed?
- Which language are you most comfortable speaking?
- Would you be comfortable with a translator?
- Are there any special ways of communicating that you like best?
- How do you feel about being touched? How closely should I sit to you? Do you prefer that I don't make eye contact with you?
- What would be the best way for you to tell me about the reason for your visit today? Some people like for me to ask questions. Some people like to tell me a story.

- May I ask specific questions as we go along so that together we can figure out what might be the problem?
- What would be the best ways for me to help you learn about your health problem and how to help you with your care?
- Do you like to have printed information? Verbal explanations? Both? Would it help for me to talk with a family member and you together?

Social, Ethnic, and Cultural Associations With Health

- How long have you lived here? Where and when did you live before coming here?
- Where are you and your family from originally?
- To which ethnic or cultural groups do you feel you belong?
- What health problems were you exposed to when you lived in those different places?
- What health problems did you have in those places?
- What did you do to get better with each problem?

Family and Social Interactions and Health

- Could you tell me who is in your family? Who is the head of your family?
- How do people in your family get along? Are there any problems that affect your health?
- What ethnic group is your family part of?
- In what ways do ethnic beliefs influence the health of your family?
- What is most important to your family for a health-care person to do to help your family?
- Whom do you socialize the most with? Family? Friends?
- Who are your friends and where do they live?
- How is the health of your family? What health habits do they have?
- What health problems do your family members have?
- What are the social groups you and your family members belong to? For work? For religious practices? For relaxation? In the community?
- What are the food and nutritional practices in your family? (See Nutritional Assessment.)

Traditions, Values, Beliefs, and Spiritual or Religious Influences Affecting Health

- Would you share with me some of the traditions about your culture that you value the most?
- Would you say you plan for the future? Or for the present? Or for both?
- What do you see as your main purpose in life?

- Who are the most important people in your life?
- Do you follow a certain faith or religion? Would you tell me which faith or religion?
- Could you tell me what this means to you?
- What are the most important things in your life?
- Are there spiritual beliefs that are important to you if you are ill?
- What do you believe caused the illness you have now?

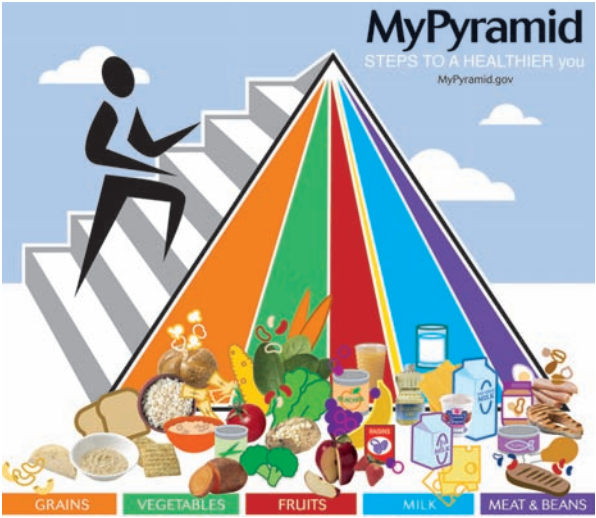
Health Beliefs, Activities, and Barriers

- What does good health mean to you?
- What does being sick mean to you?
- What do you do to be healthy?
- How do you know when you're sick?
- If you have a mild sickness, what do you do?
- If you are very sick, what do you do?
- Who helps you when you are sick?
- Who is the person in your family who makes decisions?
- Who cares for the family's health?
- What rules/restrictions related to seeking or having health care do you keep? Are these a part of your culture? Your religion?
- Whom do you like to have as your health-care provider? Why?
- Are there barriers that restrict your health care at home? In the community?

Nutritional Assessment

General Considerations

- Refer to National Institute of Medicine Dietary Reference Intakes for guidelines about energy requirements; recommended dietary allowances; and adequate intakes for water, energy, energy nutrients, vitamins, and minerals.



- Review for self and refer patient to the USDA's *MyPyramid* for healthy recommendations for personal eating plans.
- When taking the patient's history, assess the role nutrition plays:
  - HPI: Does diet influence this or other illnesses?
  - PMH: Did nutrition play a role in past illnesses or surgeries
  - FH: What role has nutrition played in the family history?
  - ROS: Are specific systems influenced by the patient's dietary/supplement intake, such as cardiovascular, and how?
- Also assess how the following have influenced the patient's diet:
  - Body weight history
  - Medications
  - Allergies and sensitivities
  - PSH
- Assess the willingness of the patient and family or caregiver to consider indicated nutritional modifications.

- Assess how the patient learns best, such as through written materials, oral instructions, or visual cues; decide with the patient, family, or caregiver what the most effective ways to help him or her make nutritional changes would be; consider past efforts' success or failure.
- Refer patient and family/caregiver to nutritional specialist if indicated.

Taking a Diet History

- Aim for a description of the patient's eating habits, foods, drinks, and changes since or during the illness.
- Consider one or more of three methods of obtaining information for a diet history:
  - **24-hour recall:** Requires the patient to remember what food and drink were consumed through the entire previous day, including the times and how much of these were consumed; most people can remember this information, but the day of recall may not be typical
  - T**ypical day description:** Requests the person to give a usual diet for a day; may give the most information unless there is no typical day for the person
  - **Food frequency method:** Requests how often and what amounts of specific foods are eaten; provides way to focus on certain areas of concern
- Questions about intake related to the specific disease or illness may be helpful, such as consumption of calcium and vitamin D with osteoporosis.
- With patients at risk related to nutritional factors, including overweight, obese, underweight, malnourished, and elderly patients, obtain a detailed history that includes diet history, psychosocial and cultural influences, and ROS and conduct a complete physical examination.

Assessment of Anemia

Type of Anemia	Cause	Blood Values	Treatment
Iron deficiency	Low iron levels in the blood, decreasing the ability of the red cell to carry oxygen	• Microcytic (MCV below 80; MCH below 27) • Elevated RDW above 14.5% • Hypochromic (less than normal color • Low serum iron levels (below 80 µg/dL for men and below 60 µg/dL for women) • Elevated TIBC and transferrin levels	• Replace iron to correct deficiency • Replace underlying cause of iron deficiency
Macrocytic	• Vitamin B12 or folic acid deficiency • Pernicious anemia • Chemotherapy • Gastric bypass or banding • Inability to absorb B12 due to lack of intrinsic factor in stomach	• Macrocytic (MCV above 95) • Normochromic (normal color) • Increased RDW	• Monthly vitamin B12 injections to correct the vitamin B12 defi ciency(corrects the anemia and may cor-rect the neurologic complications if taken soon enough) • Preparation of vitamin B12 to be given through the nose

Continued

Assessment of Anemia—cont'd

Type of Anemia	Cause	Blood Values	Treatment
Aplastic	Bone marrow producing too few of all three types of blood cells: • Red blood cells • White blood cells • Platelets	• Normocytic • Normochromic • Low red blood cell count • Low white blood cell count • Low platelets • Usually requires a bone marrow examination for diagnosis	• Immunosuppressant therapy • Bone marrow transplant

Continued

Assessment of Anemia—cont'd

Type of Anemia	Cause	Blood Values	Treatment
Thalassemia	• An inherited autosomal recessive blood disease • Genetic defect resulting in reduced rate of synthesis of one of the globin chains that make up hemoglobin • Reduced synthesis of one of the globin chains causing the formation of abnormal hemoglobin molecules, in turn causing the characteristic presenting symptom of anemia • **Thalassemia major:** A serious and often life-threatening disease • **Thalassemia minor:** A problem that, once diagnosed, can be followed with watchful waiting	• Microcytic • Hypochromic • Decreased MCV • Decreased MCHC	• Thalassemias may coexist with other deficiencies, such as folic acid and iron deficiency in thalassemia minor • A serum ferritin test can determine iron levels and guide patient to further treatment if necessary • Thalassemia minor, although not life threatening on its own, can affect quality of life as a result of the effects of a mild to moderate anemia • Studies have shown that thalassemia minor often coexists with other diseases such as asthma and mood disorders

Continued

Assessment of Anemia—cont'd

Type of Anemia	Cause	Blood Values	Treatment
Anemia of chronic disease	• Increasingly referred to as "anemia of inflammation" • A form of anemia seen in chronic illness (e.g., from chronic infection, chronic immune activation, malignancy) • Likely primarily the result of the body's production of hepcidin, a master regulator of human iron metabolism	• Normocytic • Normochromic • Decreased MCV	• Successful treatment of the chronic disease • Transfusion • Erythropoietin
Hemolytic anemia	• Anemia from hemolysis, the abnormal breakdown of red blood cells, either in the blood vessels (intravascular hemolysis) or elsewhere in the body (extravascular)	• Normocytic • Normochromic • Hemolysis of red cells	• Definitive therapy depends on the cause • Symptomatic treatment can be given by blood transfusion, if there is marked anemia • In severe immune-related hemolytic anemia, steroid therapy is sometimes necessary • Sometimes splenectomy can be helpful where extravascular hemolysis is predominant

Continued

Assessment of Anemia—cont'd

Type of Anemia	Cause	Blood Values	Treatment
Acute blood loss anemia	• Anemia that is the direct result of the decrease in circulating red blood cells • Blood loss from accident or other causes exceeding 1,000 mL or more may result in acute consequences	• Normocytic • Normochromic • Decreased MCV • Decreased MCHC • Increased RDW • Decreased blood pressure secondary to decreased volume	• For minor blood loss (<1,000 mL), fluid replacement and iron may restore RBC levels • For greater amounts of blood loss (>1,000 mL), transfusions and replacement of clotting factors may be necessary in addition to fluid replacement

Pediatric Assessment

Pediatric Developmental Milestones

Age	Developmental Milestones
1 month	Cries to communicate, reflex activity, eye contact
2 months	Coos, smiles, frowns, tracks objects, lifts head
3 months	Turns from back to side; sits with support
4 months	Turns from back to abdomen; lifts head and bears weight on forearms; can hold head erect; places everything in mouth; grasps with both hands; laughs; makes consonant sounds
5 months	Turns from abdomen to back; uses hands independently; plays with toes; puts feet into mouth
6 months	Sits alone, leaning forward on hands; holds bottle; extends arms to be picked up; starts to show a fear of strangers; begins to make wordlike sounds; looks for dropped objects; plays "peek a boo"
7 months	Begins to crawl; bears weight on feet when supported
8 months	Pulls to standing position; sits alone without any support; increased fear of strangers
9 months	Walks alongside furniture; well-developed crawl; bangs objects together; drinks from cup; attempts to feed self; looks for hidden objects
10 months	May begin to walk and climb; one-handed dominance apparent; may say one or two meaningful words
11 months	Understands meaning of word "no"; can follow simple directions; cooperates with dressing activities; uses spoon
12 months	Walks alone or with one hand held; falls frequently while walking; points with one finger; drinks well with cup; pulls off socks
15 months	Walks independently; throws overhanded; pulls or pushes toys; builds with blocks; scribbles with crayon
18 months	Runs clumsily; jumps in place with both feet; able to say about 10 words; may be able to control anal and urinary sphincters

Continued

Pediatric Developmental Milestones—cont'd

Age	Developmental Milestones
2 years	Runs well; climbs stairs by placing both feet on each step; attains bladder and bowel control between 2 and 3 years of age; names familiar objects; combines two to three words into meaningful phrases
2½ years	Jumps from chair to step; stands on one foot briefly
3 years	Rides tricycle; turns doorknobs; climbs stairs by alternating feet on steps; dresses self; uses short sentences
4 years	Hops on one foot; catches ball; names colors
5 years	Skips well; jumps rope; maintains balance with eyes closed; uses complete sentences; vocabulary of about 2,100 words
6–12 years	Swims, skates, rides bicycle, ties shoes, uses crayon or pencil well, has strong sense of fairness, awareness of rule-governed behavior, uses complex sentences, reads, counts, forms clubs or groups
Adolescent	Learns to care for self independently while learning to effectively interact with society

Source: Myers, E: *RN Notes Clinical Pocket Guide.* Philadelphia, F.A. Davis, 2003.

Basic Gynecologic Examination*

*These guidelines assume that the examiner is alone without a nursing assistant.

Responsibilities of Examiner

- Patient should be informed when she makes the appointment not to have coitus; douche; or use tampons, foams, creams, jellies, or suppositories for 48 hours prior to examination. Instruct the patient that Pap smears may not be done during menses.
- Provide and assure privacy for the patient. Obtain signed informed consent if required in institution.
- Notify patient in writing within 30 days of results of tests and follow-up needed.
- Wash hands thoroughly before the examination begins.

- Place gloves on both hands before touching patient; double glove if concerned with infectious material. Maintain universal precautions. Use nonlatex gloves in case of latex allergy of patient.
- If any equipment malfunctions during examination, have replacements available.
- Do not contaminate the outsides of test containers that other personnel will touch in transferring specimens from sites to containers.
- Do not leave the patient in lithotomy position with speculum in place if you have to leave the room to retrieve additional equipment. Remove speculum, put patient's legs down on table extension, then reposition and reinsert speculum after returning.
- Record findings as soon as possible. Inform patient of findings or any concerns because this examination often brings forth questions and concerns from women. Schedule appropriate follow-up.

Preparation of Equipment and Room

- Have all necessary equipment clean, checked, and ready to use before patient is prepared.
- Arrange equipment for ease and order of use.
- Basic equipment required:
  - Examination table with adjustable stirrups
  - Rolling stool with adjustable height
  - Excellent light source, such as lighted speculum, gooseneck lamp, head lamp
  - Clean nonlatex gloves
  - Clean coverings for table and draping
  - Vaginal specula
  - Testing equipment:
    - Labels with patient information/date
    - Cytological equipment
  - Warm water
  - Water-soluble lubricant; be sure never to touch outlet of tube or bottle with glove during any part of examination; drop lubricant onto fingers. Discard any contaminated tube/bottle.

Preparation of Patient

- Have patient empty her bladder; save specimen if indicated.
- Explain all procedures and equipment. Ideally, patient has been provided with written information prior to examination.

ASSESS

- Ask patient to remove clothing covering lower abdomen and pelvis. She may leave shoes on if more comfortable.
- Assist patient to assume lithotomy position; adjust table so that head of table is elevated about 30 degrees. This is not done until after the abdominal examination is completed. It does not interfere with pelvic examination findings and provides patient with more control.
- Be sure legs are equally positioned in stirrups. If shoes off, place clean paper towels in stirrups under feet.
- Position patient's buttocks slightly off end of table so that speculum may be introduced without interference of table.
- Assure patient of explanations during the examination and help her relax. Deep breathing techniques are helpful for relaxation.

External Genitalia Assessment

- Inspect and palpate femoral nodes, mons pubis, labia minora and majora, clitoris, urethral meatus, and vaginal introitus for lesions, erythema, discharge, edema, nodules, or parasites in hair.
- Inspect but do not touch areas of perineum, rectum, and anus. This can be done at time of rectal examination.
- Assess sexual maturity level of genitalia, including hair pattern.
- If ulceration present, take specimen for diagnosis.
- Check Bartholin's glands with index finger and thumb at 5 and 7 o'clock for swelling or tenderness; test any discharge from openings inside introitus.
- Assess vaginal support for cystocele, rectocele, or prolapse. Separate labia with fingers; ask patient to bear down, and note location and extent of any bulging. If patient has indicated urinary incontinence, examiner should lean to the side during this examination in case of forceful urine loss.

Internal Vaginal and Cervical Examination

- Insert one finger and identify location/position of cervix and any obstructions.
- Insert appropriate-size warmed, lubricated speculum at slight angle to avoid urethral meatus, turn horizontally, and open to see ectocervix and cervical os.
- Gently remove excessive discharge that interferes with view with cotton-tipped applicator.
- Determine cervical size, shape, color, and position; determine location of lesions, nodules, masses; identify any bleeding or discharge.

- Obtain wet mount or saline test tube specimens of cervical discharge; take specimen from under cervix prior to Pap smear to avoid blood in specimen; do not take from cervical os or ectocervix. Evaluate microscopically after exam for abnormal epithelial cells, blood cells, or organisms.
- Check pH of cervical discharge with pH paper strip; compare color with standards.
- Obtain cervical cytology specimen (Pap smear) using institutional procedure and equipment; important to gain cells from the transformation zone and the ectocervix.
- Specimens may be obtained with cervical spatula from ectocervix and with endocervical brush, cervical broom, or some other preferred method from endocervix.
  - For pregnant women, use short rounded portion of spatula for ectocervical specimen and saline-moistened cotton-tipped applicator for endocervical sampling.
  - For women using birth control pills, the transformation zone may be out on the ectocervix.
  - For postmenopausal women, transformational zone may need to be accessed further into cervical os because it recedes with aging.
- Prepare sample as directed on slides with fixative within 10 seconds, or place slide in fixative bottle.
- If indicated, obtain specimens for sexually transmitted diseases; swabs from syphilitic ulcerations should be taken.
- If patient bleeds from cervix after tests completed, apply pressure with large cotton-tipped applicator for several minutes. May need to apply Monsel's solution to stop bleeding.
- Inspect the vaginal walls by turning and opening speculum blades (and during withdrawal) to visualize for nodules, masses, ulcerations, other lesions, color, erythema, discharge, and presence or absence of rugae.

Bimanual Pelvic Examination

- Remove speculum; place inside clean glove to retain if further discharge specimens needed, otherwise dispense in proper covered container.
- Lubricate index and middle finger of dominant hand; tell patient you're going to insert two fingers to check internal organs and keep fingers of other hand on her lower abdomen to palpate the uterus and other organs between internal and external fingers.

ASSESS

- Palpate all vaginal walls; fornices around cervix; and region of urethra and bladder for nodules, masses, or tenderness.
- Palpate cervix for shape, size, position, consistency, and mobility and any irregularities or tenderness.
- Determine position of uterus: anteroverted, retroverted, retroflexed, or midplane.
- Palpate the uterus between both sets of fingers for size, shape, consistency, and mobility and for tenderness or masses.
- If uterus cannot be palpated with the abdominal hand, it is retroverted, retroflexed, or midplane, or the patient may be obese or have excessive fluid in the abdominal/pelvic cavities.
- Palpate each ovary and adnexa between the two sets of fingers for size, shape, consistency, mobility, and tenderness. The ovaries may not be palpable if the woman is obese, has pain, or is very tense.
- Assess pelvic muscle strength as withdrawing by spreading the two fingers before exiting vagina and asking patient to squeeze vaginal muscles around your fingers. Note seconds squeeze can be maintained and movement of fingers upward and inward.

Rectovaginal Examination

- Replace glove used for vaginal or uterine examination with a new glove. Lubricate index and middle fingers.
- Ask patient to bear down as if having bowel movement to relax sphincter; insert index finger into vagina and middle finger into rectum slowly, advising patient she will not defecate even if feels she will.
- Find cervix with vaginal finger; palpate area behind cervix of the cul de sac and along the rectovaginal wall for nodules, masses, or tenderness.
- Palpate posterior surface of uterus, left and right ovaries and adnexal structures.

Clinical Pearl: Retropositioned uteruses are best evaluated with this examination; midplane uteruses may not be easily palpated.

Anorectal Examination

- Change gloves; lubricate one finger.
- Inspect area of perineum, external rectum, and anus for color and for discolorations, lesions, ulcerations, hemorrhoids, fissures, bleeding, or discharge.

- Palpate external rectoanal area, and gently insert lubricated finger as high as comfortable for patient in rectum.
- Palpate accessible rectal wall for nodules, masses, internal hemorrhoids, or tenderness.
- Wipe off patient's external genitalia and rectal area with tissues, help her sit up, and offer tissues to her for self-care before dressing. Show her where to dispose of tissues appropriately before you leave the room.
- Make sure she is able to come down from the exam table without incident.

Neurologic Assessment

Assessment	Tests Used	Findings
Spinal reflexes	**Deep tendon reflexes:** Briskly tapping the tendon of a partially stretched muscle	Hyperactive reflexes suggest central nervous system disease
Motor pathways	**Cranial nerve motor function:** Touch tip of little finger and tip of thumb together	Inability to do this could mean carpal tunnel syndrome
Coordination	**Rapid alternative movements:** Have patient strike one hand on thigh, raise hand, turn it over, and strike the back of the hand down in the same place	Inability to do this task quickly could indicate cerebellar disease
	Point-to-point movements: Ask patient to touch your index finger then his or her nose alternately several times	Jerky or slow movements could indicate cerebellar disease

Continued

Assessment	Tests Used	Findings
Gait	Heel-to-toe walk	Inability to walk heel to toe indicates ataxia
	Hop in place	Inability to hop in place may indicate weakness, lack of proprioception, or cerebellar dysfunction
	Romberg test: Have patient stand with feet together and eyes open, then closing both eyes for 20–30 seconds; swaying and inability to hold position are signs of positive Romberg test	Positive Romberg test could indicate cerebellar ataxia
	Pronator drift: • Patient should stand for 20–30 seconds with both arms straight forward and palms upward with eyes closed. • Clinician should tap arms briskly downward • In normal patients the arms return smoothly to the horizontal position	Inability to hold arms horizontal indicates cerebellar dysfunction. The pronation of one forearm suggests a contralateral lesion in the corticospinal tract

Continued

Assessment	Tests Used	Findings
Sensory	Discriminative sensations	
	Stereognosis: Identify an object by feeling it	Astereognosis (inability to identify objects) suggests a lesion in the sensory cortex
	Graphesthesia: Ability to identify a number written with object on palm of hand	Agraphesthesia (inability to identify number on palm of hand) and lack of two-point discrimination suggest a lesion in the sensory cortex
	Two-point discrimination: Using sides of two pins or open end of two paper clips, touch finger pad. Alternate the double stimulus between sharp and dull	
Speech	Inability to speak or a disturbance in fluency	Aphasia, indicating a disturbance in Wernicke area in the brain
Brudzinski's sign	Sudden, brief, nonrhythmic flexion of the hands and fingers	Indicating metabolic encephalopathy
	Flexion of the hips and knees as you flex the neck	Brudzinski's sign, indicating meningeal inflammation
Kernig's sign	Flex the patient's leg at both the hip and knee, then straighten knee	Pain and increased resistance to extending the knee are a positive Kernig's sign, suggesting meningeal irritation

Continued

Assessment	Tests Used	Findings
Tremors	Observed intention tremors	Absent at rest, appearing with activity and getting worse as target is neared, indicating cerebellar disorders, multiple sclerosis
	Observed resting tremors	Most prominent at rest, decreasing or disappearing with voluntary movement, indicating Parkinson's disease
	Observed chorea	Brief, rapid, jerky, irregular, and unpredictable movements occurring at rest or interrupting normal movement, indicating Huntington's disease
	Observed athetosis	Slow twisting movements, writhing, commonly involving face and distal extremities; associated with spasticity, indicating cerebral palsy
	Observed tic	Brief, repetitive, stereotyped, coordinated movements at irregular intervals is associated with cranial nerve damage
	Observed facial dyskinesias	Rhythmic, repetitive, bizarre movements that chiefly involve the face, mouth, jaw, and tongue can be a late complication of psychotropic drugs (tardive dyskinesias or longstanding psychoses)

Suicide Assessment

Guidelines for Assessment and Intervention

Assessment	Intervention
Patient states suicidal ideation	Provide a safe environment; allow patient to express feelings. Do not argue with patient.
Intention	Ask patient if he or she thinks about or intends to harm self.
Plan	Ask patient if he or she has formulated a plan. What are the details? Where, when, and how will the plan be carried out?
Means	Check availability of method to commit suicide. Does the patient have or have access to a gun, knife, or pills?
Rescue	Call 911; do not allow patient to go home; call family.

High-Risk Populations

Groups at risk for suicide include:

- Adolescent and young adults (ages 15–24)
- Elderly patients (more men than women)
- Patients who are terminally ill
- Patients with extreme stress or loss
- Survivors of persons who have committed suicide
- Patients with bipolar disease or depressions
- Patients who abuse alcohol or drugs
- Patients who have previously attempted suicide

Erikson's Developmental Stages*

Stage/Goal	Age	Outcomes If Goals Met	Outcomes If Goals Not Met
Trust vs Mistrust: Needs maximum comfort with minimal uncertainty to trust himself/herself, others, and the environment	Infant (birth to 18 months)	•Strong bonds • Trust in mothering figure	• Inability to bond • Insecure • Distrustful
Autonomy vs Shame and Doubt: Works to master physical environment while maintaining self-esteem	Toddler (18 months–3 years)	• Independence • Some self-esteem	• Doubtful of own ability • Dependent
Initiative vs Guilt: Begins to initiate, not imitate, activities; develops conscience and sexual identity	Preschooler (3–6 years)	• Sense of purpose and ability	• Immobilized by guilt • Dependent
Industry vs Inferiority: Tries to develop a sense of self-worth by refining skills	School-aged child (6–12 years)	• Self-confidence by doing and achieving	• Sense of inferiority • Inability to achieve
Identity vs Role Confusion: Tries integrating many roles (child, sibling, student, athlete, worker) into a self-image under role model and peer pressure	Adolescent (12–20 years)	• Secure sense of self • Positive ideals	• Confusion • Inability to make decisions
Intimacy vs Isolation: Learns to make personal commitment to another as spouse, parent, or partner	Young adult (20–30 years)	• Lasting relationship or commitment	• Isolation • A fear of commitment

Continued

Stage/Goal	Age	Outcomes If Goals Met	Outcomes If Goals Not Met
Generativity vs Stagnation: Seeks satisfaction through productivity in career, family, and civic interests	Middle-aged adult (30–65 years)	• Creates a family • Considers future and welfare of others	• Stagnation • Self-centered • Unfulfilled life and career
Integrity vs Despair: Reviews life accomplishments; deals with loss and preparation for death	Older adult (65–death)	• Positive sense of self-worth • Accepts and prepares for death	• Feeling of hopelessness • Fears and denies death

*Developed by Erik Erikson in 1956.

Symptoms of Depression

The following are signs of depression and should warrant further investigation on the part of the health-care provider:

- Significant weight loss when not dieting or weight gain (i.e., a change of more than 5% of body weight in a month) or decrease or increase in appetite
- Insomnia or hypersomnia (excessive sleeping) nearly every day
- Feeling restless or sluggish to the point that others notice
- Fatigue or loss of energy
- Feelings of worthlessness or excessive or inappropriate guilt
- Diminished ability to think or concentrate or indecisiveness
- Recurrent thoughts of death (not just fear of dying), recurrent suicidal thoughts without a specific plan, or a suicide attempt or a specific plan for committing suicide

Easy-to-Miss Important Diagnoses

Diagnosis	Signs and Symptoms	Laboratory and Test Findings
Deep vein thrombosis	• Often few symptoms but could have pain, swelling, redness, and increased warmth to the affected area. • Risk factors warranting increased suspicion include obesity, age, trauma, cancer, immobility, smoking, use of oral contraceptives, and recent surgery.	• When DVT is suspected based on history and signs and symptoms, send patient immediately for an ultrasound of the affected area and D-dimer test. • D-dimer is useful as a negative predictive test for DVT (if D-dimer is negative, it is unlikely the patient has a DVT).
Tubal (ectopic) pregnancy	• Women of childbearing age often present with sharp abdominal pain and nausea similar to appendicitis or gastroenteritis. • Other signs may include vaginal bleeding and fever. • If the tube ruptures, pain becomes extreme and shock can ensue. This makes ectopic pregnancy an emergency diagnosis.	Three tests used to diagnose ectopic pregnancy: • Serum HCG quantitative analysis • Serum progesterone levels • Vaginal ultrasound These should be performed if any suspicion of ectopic pregnancy exists.

Continued

Diagnosis	Signs and Symptoms	Laboratory and Test Findings
Upper respiratory infection (bacterial vs viral)	**Viral URIs:** • Usually last less than 10 days • Have clear-to-yellow discharge from nose and cough • May or may not have fever • Associated with aches, watery eyes, and swollen mucous membranes in the nose • May result in chronic cough from post-nasal drip • Respond to supportive treatment, anti-histamines, fluids, vitamin C, and zinc	**Viral URIs:** • Lymphyocytes may become increased.
	Bacterial URIs: • More often associated with fever • Nasal discharge is green or dark in color • Often causes a chronic cough not from postnasal drip • Higher risk for patients with chronic pulmonary diseases or impaired immune systems who should be treated even when symptoms are not clearly bacterial in nature • Treatment of choice is antibiotics, although overuse has caused the emergence of resistant strains of bacteria; therefore, antibiotics should be used when symptoms of bacterial URI are present	**Bacterial URIs:** • High WBC count with increased neutrophils on CBC • Increased bands or a "shift to the left" in the WBC count in acute URI • Elevated monocytes in chronic URI

Continued

Diagnosis	Signs and Symptoms	Laboratory and Test Findings
Appendicitis	• An early sign is aching pain around the navel that often shifts later to the lower right abdomen. • Pain may become sharper and more severe. • Pain tends to settle in the lower right abdomen, near the appendix, at McBurney point (about halfway between the navel and the top of the right pelvic bone). • The location of pain may vary with age and position of the appendix. • Young children or pregnant women, especially, may have different symptoms such as nausea, vomiting, diarrhea, loss of appetite, fever, constipation, inability to pass gas, or abdominal swelling. • A late sign is rebound tenderness (pain is worse when pressure on the area is released). Pain is often worse with movements such as walking or pulling knees up to chest.	**Diagnostic tests include:** • CBC to detect increased WBC count • Abdominal x-ray, ultrasound, or CT scan **Diseases with matching symptoms to be ruled out include:** • Ectopic pregnancy • Ovarian cyst • Kidney stones • Crohn's disease

Continued

Diagnosis	Signs and Symptoms	Laboratory and Test Findings
Pneumonia	**Risk factors for pneumonia:** • Age older than 65 years • Male gender • Living in nursing home • Age younger than 2 years • Comorbid respiratory conditions • Immunocompromised status • Receiving chemotherapy • After splenectomy • Smoking tobacco products • Use of alcohol • Diagnosis of anemia, heart disease, diabetes, or kidney disorders **Symptoms of bacterial pneumonia:** • Fever, chills, chest pain, green-to-brown sputum, decreased breath sounds, and consolidation of breath sounds in one area of lung **Symptoms of viral pneumonia:** • Fever, dry cough, headache, muscle pain, weakness increasing breathlessness, and circumoral cyanosis **Symptoms of mycoplasma pneumonia:** • Violent coughing attacks, chills, fever, nausea, vomiting, diarrhea, bradycardia, bluish nailbeds, muscle aches, and rash	**Diagnostic tests include:** • CBC for high WBC count • Chest x-ray to determine if there are areas of consolidation Chest x-ray should be repeated 1 month after treatment to determine if consolidation has resolved.

Continued

Diagnosis	Signs and Symptoms	Laboratory and Test Findings
Hypothyroidism	**Signs and symptoms, possibly subtle:** • Fatigue, weight gain, hair loss, constipation, dry skin, changes in menstrual cycle, dizziness, sensitivity to cold, muscle and joint aches, and rough dry skin • Carpal tunnel syndrome and obstructive sleep apnea if left untreated	• Hypothyroidism occurs when the TSH is mildly elevated but tri-iodothyronine (T_3) and thyroxine (T_4) levels are normal • It is advisable to check TSH levels yearly for patients older than age 40. Elevated TSH indicates hypothyroidism. • Thyroid hormone replacement is indicated as the treatment for hypothyroidism.

Emergency Care

Emergency	Diagnostic Signs and Symptoms	Treatment	Follow-up Care
Anaphylaxis	Anaphylaxis is a severe, whole-body allergic reaction. After an initial exposure to a substance such as bee sting toxin, the person's immune system becomes sensitized to that allergen. On a subsequent exposure, an allergic reaction occurs. This reaction is sudden, severe, and involves the whole body: • Hives • Difficulty breathing • Wheezing • Confusion • Slurred speech • Cyanosis • Dizziness/fainting • Anxiety • Nausea, vomiting, diarrhea • Angioedema swelling may close off airway • Pulmonary edema • Cardiac arrhythmias	**Emergency condition requiring immediate professional medical attention:** • Assessment of the ABCs (airway, breathing, and circulation from Basic Life Support)in all suspected anaphylactic reactions • Epinephrine by injection (EpiPen®) without delay in severe anaphylactic reactions to open the airways and raise blood pressure by constricting blood vessels • IV fluids and medications that support the actions of the heart and circulatory system in the case of shock • Antihistamines or corticosteroids to further reduce symptoms	• Ensure that allergen is noted. • Patient wears a MedicAlert bracelet. • Patient carries an epinephrine injection.

Continued

Emergency	Diagnostic Signs and Symptoms	Treatment	Follow-up Care
Burns	**First-degree burns:** • Only the outer layer of skin burned; usually red, with swelling and pain **Second-degree burns:** • First layer of skin burned through; second layer of skin (dermis) also burned **Third-degree burns:** • All layers of skin involved; little or no pain; permanent damage	**First-degree and minor second-degree burns <7.5 cm:** • Cool the burn. • Hold burned area under cold running water for at least 5 minutes or until the pain subsides. • May apply silver sulfadiazine (Silvadene) cream to affected area. • Cover the burn with a sterile dressing. • Prescribe OTC pain reliever. • Do not use ice. • Do not apply butter or ointments to burn. • Do not break blisters. **Third-degree burns:** • Do not remove clothing. • Do not immerse third-degree burns in ice water. • Check for airway, breathing, and circulation. • Elevate burned body parts. • Cover the area of the burn. • Send to emergency room or call 911.	**First-degree and minor second-degree burns:** • Antibiotics may be necessary because burns are susceptible to infection **Third-degree burns:** • Follow up after ER visit. • Refer to dermatology for skin grafts if necessary or requested.

Continued

Emergency	Diagnostic Signs and Symptoms	Treatment	Follow-up Care
Bites	Cat and human bites are more likely to become infected than dog bites. Bites to the hand are of special concern because of the possibility of closed-space infection. Antibiotic prophylaxis indicated for noninfected bites of the hand, and hospitalization required for infected hand bites. All infected wounds should be cultured to direct therapy.	• Vigorous cleansing and irrigation of the wound • Debridement of necrotic material • Suturing, but NEVER of an infected wound or a wound on the hand • Prophylactic antibiotics indicated for high-risk bites **Cat bites in any location:** • Dicloxacillin 0.5 g orally 4 times a day for 3–5 days **Hand bites from any animal:** • Penicillin V 0.5 g orally 4 times a day for 3–5 days **Other options with broader spectrum of action include:** • Cefuroxime • Amoxicillin-clavulanic acid • Clindamycin • Ciprofloxacin or levofloxacin Tetanus and rabies evaluation should be completed on all bite patients.	• Follow up to determine effect of antibiotics

Continued

Emergency	Diagnostic Signs and Symptoms	Treatment	Follow-up Care
Methicillin-resistant *Staphylococcus aureus* (MRSA)	MRSA is a type of bacteria that is resistant to certain antibiotics. "Staph" or MRSA infections in the community are usually manifested as skin infections, such as pimples and boils, and occur in otherwise healthy people.	• Suspicious wounds should be cultured • For antibiotics effective for MRSA infections or suspected MRSA infections in the outpatient setting, see Current Guidelines	• Follow up to check on progress of healing. • If wound is not healing properly, hospitalization for IV antibiotic infusions may be required.
Poisoning	A poison is any substance that is harmful to the body when ingested, inhaled, injected, or absorbed through the skin. Any substance can be poisonous if enough is taken. Most cases of poisoning are the result of ingestion of drugs, both prescription and over the counter.	• For information about treating an episode of poisoning, the National Capital Poison Hotline can be reached at 1-800-222-1222 • Many states and local municipalities have poison control hotlines as well	• Immediate referral to the emergency room is required for anyone who has been exposed to poisons.

Continued

Emergency	Diagnostic Signs and Symptoms	Treatment	Follow-up Care
Hiccups	Persistent hiccups may be a sign of a serious underlying illness. Most common causes of persistent hiccups include: • Neoplasm • Infection • Cerebrovascular accident (CVA) • Trauma • Uremia • Hyperventilation • Irritation of the vagus or phrenic nerve • General anesthesia • Psychogenic causes	Treatments include: • Lifting uvula with a spoon • Eating 1 tsp dry granulated sugar • Holding breath • Valsalva maneuver • Sneezing • Gasping • Rebreathing into a bag • Holding knees to chest Drug treatments include: • Chlorpromazine 25–30 mg orally or intramuscularly • Phenytoin • Carbamazepine • Benzodiazepines • Metoclopramide • Gabapentin	• Follow up with patient until hiccups subside. • Determine underlying cause of hiccups over time.

X-Rays

Bone Densitometry

Also called dual-energy x-ray absorptiometry (DEXA), bone densitometry is used to measure bone loss. DEXA is the standard method for measuring bone mineral density.

When to Use

Bone density is used to diagnose osteoporosis. DEXA is used to measure bone mineral density (BMD) by exposing parts of the body to small doses of ionizing radiation. It is usually performed on the lower spine and hips. Portable devices measuring wrists, fingers, or heel are used only for screening purposes. Once the scan has been completed, two scores will be reported to the provider.

Z Score

The Z score reflects the amount of bone the patient has compared with other people in the same age group.

T Score

The T score reflects the amount of bone the patient has in comparison to young adults of the same gender and is the most important measurement of risk for fracture development. A score higher than –1 is considered normal. A score between –1 and –2.5 is classified as osteopenia, the first stage of bone loss. A score of less than –2.5 is defined as osteoporosis.

Mammogram

A mammogram is a low-dose x-ray of the breast used to determine whether abnormal growths or cysts are present. It is an important tool for early detection of breast cancer and is recommended for all women older than age 40 years.

Screening Mammogram

A screening mammogram is an x-ray exam of the breast in a woman who has no symptoms. The goal of its use is to find cancer when it is still too small to be felt by a woman or her doctor.

Diagnostic Mammogram

A diagnostic mammogram is an x-ray exam of the breast in a woman who either has a breast complaint, such as a breast mass or nipple discharge, or has had an abnormality found during a screening mammogram. During a diagnostic mammogram, more pictures are taken to carefully study the breast condition. In most cases, special images involve magnification to make a small area of suspicious breast tissue easier to evaluate.

Clinical Breast Examination

A clinical breast exam (CBE) is done to detect breast abnormalities or evaluate patient reports of symptoms to find palpable breast cancers at an earlier stage of progression. It should be performed by a health care provider at least every 3 years for women older than age 20 years and yearly in women starting at age 40 years.

Breast Self-Examination

The breast self-exam (BSE) is an important part of cancer prevention, and women should be educated to perform monthly BSEs and to immediately report any changes in breast architecture.

US Preventive Services Task Force Recommendations

Women Aged 40 Years and Older

- Screening mammography, with or without CBE, every 1–2 years.

Women Aged 20–40 Years

- CBE as part of a regular health examination at least every 3 years.

Women at High Risk (greater than 20% lifetime risk)

- MRI and a mammogram each year
- High risk includes:
  - Known BRCA1 or BRCA2 gene mutation
  - First-degree relative with BRCA1 or BRCA2 gene mutation
  - Lifetime risk of breast cancer of 20%–25% or greater, according to risk assessment tools based mainly on family history

Computed Tomography

Diagnostic Use by Anatomic Region

Region	Diagnostic Use
Head	• NO CONTRAST used for ruling out a bleed • CONTRAST used for ruling out a mass
Chest	• Detection of acute and chronic changes in lung parenchyma • Evaluation of chronic interstitial processes, such as emphysema and fibrosis • Continuous images provided by high-resolution CT done during inspiration and exhalation • IV CONTRAST used for the detection of air-space disease and boundaries of the great vessels and assessment of the mediastinum and hilar regions for lymphadenopathy (important when a diagnosis of lung cancer is suspected)
Pulmonary angiogram	• Preferred method for diagnosis of pulmonary embolism • Test completed in less than 5 minutes • Any mass/filling defect such as an embolus appears dark in place of the contrast filling
Cardiac (cardiac CT angiography)	• Can be used with retrospective electrocardiogram gating • Exposes patient to high levels of radiation (equivalent to 600 chest x-rays) • 90% sensitive for coronary artery disease, with a negative predictive value of 93%

Continued

Diagnostic Use by Anatomic Region—cont'd

Region	Diagnostic Use
Abdominal and pelvic	• Very sensitive method for diagnosing abdominal disease • CONTRAST used for ruling out appendicitis and diverticulitis • NO CONTRAST used for ruling out kidney stones • Used to determine stages of cancer and follow progress • Can be used to investigate acute abdominal pain, renal stones, appendicitis, pancreatitis, diverticulitis, abdominal aortic aneurysm, and bowel obstruction • The first line for detecting solid organ injuries after trauma • Used in osteoporosis studies alongside densitometry
Extremities	• Diagnosis of complex fractures, especially around the joints • Diagnosis of ligamental injuries and dislocations

Magnetic Resonance Imaging

MRI, rather than CT, should be performed in the following situations:

- In patients with serious allergies or renal failure because contrast-enhanced MRI is safer than contrast-enhanced CT
- For imaging of the liver because it does not use the ionizing radiation associated with CT scanning
- For imaging of the pancreas, adrenals, and kidneys at centers with considerable MRI experience (at centers with CT experience, CT is adequate; practice should change, however, with more centers doing MRI)
- In male and female patients requiring imaging of pelvic organs (although ultrasound is effective for many noncomplex female pelvic conditions)
- For imaging of the bowel at a few centers

- For imaging of large- and medium-sized vessels, mainly for safety reasons
- In patients with vessel disease (particular strengths in this area; described as MR angiography)

CT is preferred over MRI in the following situations:

- In patients with suspected kidney stones
- For imaging of small vessels
- In patients with most lung diseases
- In patients with most types of severe acute trauma
- For determining the location of tubes and catheters in very sick patients

Ultrasound

Ultrasound is safe, noninvasive, and easy to complete. It does not cause pain for the patient, and it may provide the first look at internal problems. Ultrasound is often followed by CT or MRI to further differentiate among problems.

Diagnostic Ultrasound Use by Anatomic Region

Region	Diagnostic Use
Thyroid	Identification of nodules and differentiation of types of thyroid cancer
Prostate	Guidance during biopsy procedure
Ovary	Identification of types of adnexal masses
Pregnancy	Identification of intrauterine growth restriction Identification of and location of products of conception. Used to diagnose intratubal (ectopic) pregnancy and for suspected threatened abortion
Pelvis	Differentiation among ovarian masses, diverticuli, and other lower abdominal masses including uterine fibroids
Cardiac	Useful for observation of coronary plaque progression
Bone	Fracture prediction
Fetus	Detection of some congenital defects

Blood and Body Fluid Evaluations

Complete Blood Count

Tube or Specimen	Normal Results	Abnormal Findings
Red or lavender top tube	**Red blood cells** Male: 4.7–6.1 Female: 4.2–5.4 **Hemoglobin** Male: 14–18 Female: 12–16 **Hematocrit** Male: 42%–52% Female: 37%–47% **Mean corpuscular volume:** 80–95	• RBC, Hgb, and Hct all reflect the ability of oxygen delivery by the RBC to all cells in the body • Decreased RBC, Hgb, or Hct are indicative of anemia • Increased RBC, Hgb, or Hct are indicative dehydration or polycythemia vera MCV is related to size of RBCs • Elevated MCV indicates macrocytic anemia (B_{12} deficiency, folic acid deficiency, hydantoin ingestion, or chemotherapy) • Decreased MCV indicates microcytic anemia (iron deficiency, thalassemia, lead poisoning)
	Mean corpuscular hemoglobin: 27–31	MCH is related to RBC cell weight • Elevated MCH, indicates macrocytic anemia (B_{12} deficiency, folic acid deficiency, hydantoin ingestion, or chemotherapy) • Decreased MCH indicates microcytic anemia (iron deficiency, thalassemia, lead poisoning)

Continued

Complete Blood Count—cont'd

Tube or Specimen	Normal Results	Abnormal Findings
Red or lavender top tube (cont'd)	**Mean corpuscular hemoglobin concentration:** 32–36	• MCHC is related to Hgb concentration • Elevated MCHC indicates macrocytic anemia (B_{12} deficiency, folic acid deficiency, hydantoin ingestion, or chemotherapy) • Decreased MCHC indicates microcytic anemia (iron deficiency, thalassemia, lead poisoning)
	Red blood cell distribution width: 11%–14.5%	• Any increase in RDW indicates anemia
	White blood cells: Neutrophils: 55%–70% Lymphocytes: 20%–40% Monocytes: 2%–8% Eosinophils: 1%–4% Basophils: 0.5%–1%	• Increased WBC indicates infection • Decreased WBC indicates decreased immune system function • For white cell differential, see later table, page 127 this tab.
	Platelets: 150,000–400,000 mllion/mm3	**Elevated platelet count (thrombocytosis)** • Malignant disorders • Polycythemia vera • Postsplenectomy syndrome • Rheumatoid arthritis • Iron-deficiency anemia **Decreased platelet count (thrombocytopenia)** • Hypersplenism • Idiopathic hemorrhage • Leukemia • Myelofibrosis disorders • Graves' disease

Continued

Complete Blood Count—cont'd

Tube or Specimen	Normal Results	Abnormal Findings
Red or lavender top tube (cont'd)		• Hemolysis, elevated liver enzymes, and low platelet count • Disseminated intravascular coagulopathy • Lupus • Pernicious anemia • Hemolytic anemia • Chemotherapy

Comprehensive Metabolic Panel

Normal Results	Abnormal Findings
Sodium: 136–145 mL/dL	**Elevated (hypernatremia)** • Increased dietary intake • Excessive sodium in IV fluids • Cushing's syndrome • Hyperaldosteronism • Excessive loss of body fluids • Thermal burns • Diabetes insipidus **Decreased (hyponatremia)** • Deficient dietary intake • Deficient sodium in IV fluids • Addison's disease • Diarrhea • Vomiting or nasogastric aspiration • Intraluminal bowel loss (ileus) • Diuretic administration • Chronic renal insufficiency • Excessive water intake • Hyperglycemia • Congestive heart failure • Ascites • Peripheral edema

Continued

Comprehensive Metabolic Panel—cont'd

Normal Results	Abnormal Findings
Potassium: 3.5–5.0 mEq/L	**Elevated (hypokalemia)** • Excessive dietary intake • Excessive IV intake • Acute or chronic renal failure • Addison's disease • Hypoaldosteronism • Potassium-sparing diuretics (spironolactone, triamterene) • Crush injury to tissues • Hemolysis • Transfusion of hemolyzed blood • Infection • Acidosis • Dehydration **Decreased (hypokalemia)** • Deficient dietary intake • Deficient IV intake • Burns • GI disorders • Diuretics • Hyperaldosteronism • Cushing's syndrome • Renal tubular acidosis • Licorice ingestion • Alkalosis • Insulin administration • Glucose administration • Ascites • Renal artery stenosis • Cystic fibrosis • Trauma
Glucose: 60–90 mmol/L	**Elevated (hyperglycemia)** • Diabetes mellitus • Acute stress response • Cushing's syndrome • Pheochromocytoma

Continued

Comprehensive Metabolic Panel—cont'd

Normal Results	Abnormal Findings
Glucose: 60–90 mmol/L (cont'd)	• Chronic renal failure • Glucagonoma • Acute pancreatitis • Diuretic therapy • Corticosteroid therapy • Acromegaly **Decreased (hypoglycemia)** • Insulinoma • Hypothyroidism • Hypopituitarism • Addison's disease • Extensive liver disease • Insulin overdose • Starvation
Calcium: 9.0–10.4 mg/dL	**Elevated (hypercalcemia)** • Hyperparathyroidism • Metastatic tumor to bone • Paget's disease of bone • Prolonged immobilization • Vitamin D intoxication • Lymphoma • Granulomatous infections (sarcoidosis, tuberculosis) • Addison's disease • Acromegaly • Hyperthyroidism **Decreased (hypocalcemia)** • Hypoparathyroidism • Renal failure • Hyperphosphatemia • Rickets • Vitamin D deficiency • Osteomalacia • Malabsorption • Pancreatitis • Fat embolism • Alkalosis

Continued

Comprehensive Metabolic Panel—cont'd

Normal Results	Abnormal Findings
Chloride: 98–106 mEq/L	**Elevated (hyperchloremia)** • Dehydration • Excessive infusion of normal saline solution • Metabolic acidosis • Renal tubular acidosis • Cushing's syndrome • Kidney dysfunction • Hyperparathyroidism • Eclampsia • Respiratory alkalosis **Decreased (hypochloremia)** • Overhydration • Syndrome of inappropriate antidiuretic hormone (SIADH) secretion • Congestive heart failure • Vomiting • Chronic diarrhea • Chronic respiratory acidosis • Metabolic alkalosis • Addison's disease • Diuretic therapy • Hypokalemia • Aldosteronism • Burns
Carbon dioxide: 23–30 mEq/L	**Elevated** • Severe vomiting • Aldosteronism • Use of mercurial diuretics • Chronic obstructive pulmonary disease (COPD) • Metabolic alkalosis **Decreased** • Chronic diarrhea • Loop diuretics • Renal failure • Diabetic ketoacidosis

Continued

Comprehensive Metabolic Panel—cont'd

Normal Results	Abnormal Findings
Carbon dioxide: 23–30 mEq/L (cont'd)	• Starvation • Metabolic acidosis • Shock
Blood urea nitrogen (BUN): 70–100 mL	**Elevated** • Impaired renal function • Congestive heart failure • Dehydration • Shock • Hemorrhage into GI tract • Stress • Excessive protein ingestion or catabolism **Decreased** • Liver failure • Malnutrition • Anabolic steroid use • Overhydration • Pregnancy • Impaired nutrient absorption • SIADH
Creatinine Female: 0.5–1.1 mg/dL Male: 0.6–1.2 mg/dL	**Elevated** • Diseases affecting renal function • Rhabdomyolysis • Acromegaly • Gigantism **Decreased** • Debilitation • Decreased muscle mass
Albumin	**Elevated** • Dehydration **Decreased** • Liver disease • Malnutrition • Inflammation • Renal problems

Continued

Comprehensive Metabolic Panel—cont'd

Normal Results	Abnormal Findings
Total protein: 6.4–8.3 g/dL	**Elevated** • Dehydration **Decreased** • Malnutrition • Pregnancy • Liver disease • Nephropathy • Third space losses • Overhydration • Increased capillary permeability • Inflammatory disease
Total bilirubin: 0.3–1.0 mg/dL	**Elevated Conjugated (direct)** • Gallstones • Extrahepatic duct obstruction (tumor, inflammation, gallstone, scarring, surgical trauma) • Extensive liver metastasis • Cholestasis from drugs **Unconjugated (indirect)** • Transfusion reaction • Sickle cell anemia • Hemolytic jaundice or anemia • Resolution of large hematoma • Pernicious anemia • Large-volume blood transfusion • Hepatitis • Cirrhosis • Sepsis • Gilbert syndrome
Alkaline phosphatase: 30–120 U/L	**Elevated** • Primary cirrhosis • Intrahepatic or extrahepatic biliary obstruction • Primary or metastatic liver tumor • Normal pregnancy (third trimester or early postpartum period)

Continued

Comprehensive Metabolic Panel—cont'd

Normal Results	Abnormal Findings
Alkaline phosphatase: 30–120 U/L (cont'd)	• Normal bones of growing children • Metastatic tumor to the bone • Healing fracture • Hyperparathyroidism • Paget's disease • Rheumatoid arthritis • Intestinal ischemia or infarction • Myocardial infarction • Sarcoidosis **Decreased** • Hypophosphatemia • Malnutrition • Milk–alkali syndrome • Pernicious anemia • Scurvy (vitamin C deficiency)
Alanine aminotransferase: 4–36 U/L	**Elevated** • Hepatitis • Hepatic necrosis • Hepatic ischemia • Cirrhosis • Cholestasis • Hepatic tumor (acetaminophen) • Hepatotoxic drugs • Obstructive jaundice • Severe burns • Trauma to striated muscle • Myositis • Pancreatitis • Myocardial infarction • Infectious mononucleosis • Shock
Aspartate Aminotransferase: 0–35 U/L	**Elevated** • Myocardial infarction • Cardiac operations • Cardiac catheterization and angioplasty • Hepatitis

Continued

Comprehensive Metabolic Panel—cont'd

Normal Results	Abnormal Findings
Aspartate Aminotransferase: 0–35 U/L (cont'd)	• Hepatic cirrhosis • Drug-induced liver injury • Hepatic metastasis • Hepatic necrosis (initial stages only) • Hepatic surgery • Infectious mononucleosis • Hepatic infiltrative process (tumor) • Skeletal muscle trauma • Recent noncardiac surgery • Multiple trauma • Severe, deep burns • Progressive muscular dystrophy • Recent convulsions • Heat stroke • Primary muscle disease • Acute hemolytic anemia • Acute pancreatitis **Decreased** • Acute renal disease • Beriberi disease • Diabetic ketoacidosis • Pregnancy • Chronic renal dialysis

Thyroid Panel

Normal Results	Abnormal Findings
Thyroid-stimulating hormone: 0.4–4.0	**Elevated** • Primary hypothyroidism • Thyroiditis • Thyroid agenesis • Congenital hypothyroidism (cretinism) • Large dose of iodine

Continued

Thyroid Panel—cont'd

Normal Results	Abnormal Findings
Thyroid-stimulating hormone: 0.4–4.0 (cont'd)	• Radioactive iodine injection • Surgical ablation of thyroid • Severe and chronic illness • Pituitary TSH-secreting tumor **Decreased** • Secondary hypothyroidism • Hyperthyroidism • Suppressive doses of thyroid medication • Factitious hyperthyroidism
Thyroxine, free: 0.8–2.8 ng/dL **Thyroxine total** Adult male: 4–12 μg/dL Adult female: 5–12 μg/dL **Triiodothyronine:** 100–200 μg/dL	**Elevated** • Primary hyperthyroidism • Acute thyroiditis • Factitious hyperthyroidism • Thyroid cancer **Decreased** • Hypothyroid states • Pituitary insufficiency • Hypothalamic failure • Iodine insufficiency • Renal failure • Cushing's disease • Cirrhosis • Surgery • Advanced cancer • Starvation

Prostate-Specific Antigen (PSA)

Tube or Specimen	Normal Results	Abnormal Findings
Red top tube	<4 ng/mL	**Interfering factors** • Digital rectal exam falsely elevates (draw PSA before DRE) • Ejaculation within 24 hours of testing • Recent urinary tract infection or prostatitis • Finasteride (Propecia, Proscar) increases levels **Elevated** • Prostate cancer • Benign prostatic hyperplasia • Prostatitis

Anemia Workup

Additional blood tests for anemia other than the CBC

Tube or Specimen	Normal Results	Abnormal Findings
Erythropoietin Red top tube • Indicates whether the kidney is producing adequate amounts of erythropoietin to stimulate adequate RBC production	5–35 IU/L	Decreased levels may mean that erythropoietin injections are required. Elevated levels indicate sickle cell trait or sickle cell anemia.
Reticulocyte count Lavender top tube • Indicates whether the bone marrow is producing RBCs	0.5%–2.0%	Decreased levels indicate bone marrow diseases.
Sickle cell preparation (Hgb S) Lavender top tube	—	Elevated levels indicate sickle cell trait or sickle cell anemia.

Hepatitis

Tube or Specimen	Normal Results
Red top tube	**Hepatitis A** ELISA or IgM: detect antibodies Hepatitis A IgM: indicates acute infection Hepatitis A IgG: indicates previous exposure to hepatitis A **Hepatitis B** Hepatitis B surface antigen: • Indicates active infection • Increases before onset of symptoms • Peaks during first week of symptoms • Returns to normal when jaundice subsides Hepatitis B surface antibody: • Signifies the end of the acute infection phase; can also signify immunity • Appears 4 weeks after disappearance of surface antigen Hepatitis B core antibody: • Can indicate chronic hepatitis • Appears at the same time as the surface antibody • Serves as the only marker of recent hepatitis infection Hepatitis Be-antigen: • Found in early and active disease with high infectivity • Persistent presence predicts chronic hepatitis Hepatitis C (HCV) enzyme immunoassay (EIA): • EIA3 can detect antibodies to HCV antigen

Prothrombin Time/Partial Thromboplastin Time/International Normalized Ratio

Tube or Specimen	Normal Results	Abnormal Findings
Prothrombin Time Blue top tube	11.0–12.5 seconds	**Elevated (prolonged PT)** • Liver disease • Hereditary factor deficiency • Vitamin K deficiency • Bile-duct obstruction • Coumarin ingestion • DIC • Massive blood transfusion • Salicylate intoxication
Partial thromboplastin time Blue top tube	60–70 seconds	**Elevated** • Congenital clotting factor deficiencies (von Willebrand's disease, hemophilia) • Cirrhosis of liver • Vitamin K deficiency • DIC • Heparin administration • Coumarin administration **Decreased** • Early stages of DIC • Extensive cancer
International normalized ratio Because of differences between different batches and manufacturers of tissue factor (it is a biologically obtained product), the INR was devised to standardize the results.	Normal: 0–1.3 when blood is not being thinned by warfarin	On blood thinner therapy such as warfarin

Continued

Prothrombin Time/Partial Thromboplastin Time/International Normalized Ratio—cont'd

Tube or Specimen	Normal Results	Abnormal Findings
International normalized ratio (cont'd) The INR is the ratio of a patient's PT to that of a normal (control) sample, raised to the power of the International Standardized Index (ISI) value for the control sample used.	Adequate range with warfarin: 2.0–3.0	In patients who require warfarin therapy adequate range is 2.0–3.0.

Lipid Panel

Component	Tube or Specimen	Normal Results	Abnormal Findings
Cholesterol	Red top tube	Normal <200	Low risk: <240 Moderate risk: 241–260 High risk: >260 **Elevated** • Familial hypercholesterolemia • Familial hyperlipidemia • Hypothyroidism • Uncontrolled diabetes • Pregnancy • Nephrotic syndrome
Low-density lipid profile	—	60–180 mg/dL	**Elevated** • Familial lipoproteinemia • Nephrotic syndrome • Hypothyroidism • Alcohol consumption • Chronic liver disease • Hepatoma • Cushing's syndrome
High-density lipid profile	Red top tube	Male: >45 mg/dL Female: >55 mg/dL	**Elevated** • Familial HDL lipoproteinemia • Excessive exercise **Decreased** • Familial low HDL • Hepatocellular disease • Hypoproteinemia

Continued

Lipid Panel—cont'd

Component	Tube or Specimen	Normal Results	Abnormal Findings
Triglycerides	Red top tube	Male: 40–160 mg/dL Female: 35–135 mg/dL	**Elevated** • Glycogen storage disease • Familial hypertriglyceridemia • Hyperlipidemia • Hypothyroidism • High carbohydrate diet • Poorly controlled diabetes • Nephrotic syndrome • Chronic renal failure **Decreased** • Malabsorption syndrome • Malnutrition • Hyperthyroidism

Erythrocyte Sedimentation Rate and C-Reactive Protein Assay

Test	Tube or Specimen	Normal Results	Abnormal Findings
Erythrocyte sedimentation rate (measures how much inflammation is in the body)	Lavender top tube	Male: up to 15 mm/ hr Female: up to 20 mm/hr	**Elevated** • Chronic renal failure • Malignant diseases • Bacterial infection • Inflammatory diseases (temporal arthritis, polymyalgia rheumatica, rheumatoid arthritis, rheumatic fever, lupus) • Necrotic disease • Severe anemia **Falsely decreased** • Sickle cell anemia • Spherocytosis • Hypofibrinogenemia • Polycythemia vera
C-reactive protein (measures the amount of protein in the blood that signals active inflammation)	Red top tube	<1.0 mg/dL	**Elevated** • Acute, noninfectious inflammatory reaction (arthritis, acute rheumatic fever, Reiter's syndrome, Crohn's disease) • Collagen vascular diseases (vasculitis syndrome, lupus erythematosus) • Tissue infarction or damage (acute myocardial infarction, pulmonary infarction, kidney or bone marrow transplant rejection, soft tissue trauma) • Bacterial infections (postoperative wound infection, urinary tract infection, tuberculosis) • Malignant disease • Bacterial infection

Toxoplasmosis, Other, Rubella, Cytomegalovirus [CMV], and Herpes (TORCH) Panel

These types of infections have a detrimental effect on the fetus. Infections that cause problems in pregnancy and during childbirth are included. Each part of the TORCH is evaluated as an individual test.

Type of Infections	Tube or Specimen	Normal Results	Abnormal Findings
Toxoplasmosis	Red top tube	**IgG titer** • 1:16—no previous infection • 1:16–256—usually prevalent in the general population • 1:256—recent infection **IgM titer** • 1:256—acute infection	**Elevated** • Toxoplasmosis infection
Rubella	Red top tube	**Hemagglutination inhibition (HAI)** • <1:8—no immunity to rubella • 1:20—immunity to rubella **ELISA IgM** • 1:1—active infection **ELISA IgG** • <7 IU/mL—no immunity to rubella • >10 IU/mL—immunity to rubella	• ELISA is now standard for rubella testing; provides the most accurate testing method. • If no immunity, immunization is recommended. • Women should not become pregnant for 3 months after immunization is complete.

Continued

Toxoplasmosis, Other, Rubella, Cytomegalovirus [CMV], and Herpes (TORCH) Panel—cont'd

Type of Infections	Tube or Specimen	Normal Results	Abnormal Findings

Cytomegalovirus	• Urine or mouth swab specimen is best
	• Fresh specimen is essential
		• Viral culture most definitive for diagnosis
		• Identification of IgM antibodies indicates a relatively recent infection
		• Three different CMV antigens can be detected immunologically:
		  • Early
		  • Intermediate-early
		  • Late
			Elevated
			• A fourfold increase in CMV titer done 10–14 days apart is usually indicative of an acute infection.

Herpes • Classified as either Type 1 or Type 2	Culture of lesion is gold standard for detection. • Swab suspicious lesions with red top viral swab culturette May obtain blood for serologic study (red top tube)	• If virus present, patient has outbreak of herpes. • If IgM antibodies are present, patient has active herpes infection. IgG antibodies indicate exposure at some time to herpes-type virus, including chicken pox.	Positive IgM antibodies means herpes virus present and active.

White Cell Differential Analysis

Type of White Blood Cell	Elevated	Decreased
Neutrophils	**Neutrophilia** • Physical or emotional stress • Acute suppurative infection • Myelocytic leukemia • Trauma • Cushing's syndrome • Inflammatory disorders (rheumatic fever, thyroiditis, rheumatoid arthritis) • Metabolic disorders (ketoacidosis, gout, eclampsia)	**Neutropenia** • Aplastic anemia • Dietary deficiency • Overwhelming bacterial infection (especially in the elderly) • Viral infections (hepatitis, influenza, measles) • Radiation therapy • Addison's disease • Chemotherapy
Lymphocytes	**Lymphocytosis** • Chronic bacterial infection • Viral infection (mumps, rubella) • Lymphocytic leukemia • Multiple myeloma • Infectious mononucleosis • Radiation therapy • Infectious hepatitis	**Lymphocytopenia** • Leukemia • Sepsis • Immunodeficiency • Lupus erythematosus • Later stages of HIV • Drug therapy (steroids, chemotherapy) • Radiation therapy
Monocytes	**Monocytosis** • Chronic inflammatory disorders • Viral infections (mononucleosis) • Tuberculosis • Chronic ulcerative colitis • Parasites	**Monocytopenia** • Steroids

Continued

White Cell Differential Analysis—cont'd

Type of White Blood Cell	Elevated	Decreased
Eosinophils	**Eosinophilia** • Parasitic infections • Allergic reactions • Eczema • Leukemia • Autoimmune diseases	**Eosinopenia** • Increased adreno-steroid production
Basophils	**Basophilia** • Myeloproliferative disease • Leukemia	**Basopenia** • Acute allergic reactions • Hyperthyroidism • Stress reactions

Step-by-Step Approach to Reading a Chest X-ray

Factor	Appropriate Considerations
Adequacy	• Check name and date on film • Organize right to left • Is it anteroposterior or posteroanterior? • Check for rotation: Are clavicles centered over the spinal column? • Check for film exposure: Is it clear? Count ribs from top: You should be able to count nine if film is correctly exposed.

Airway	• Is the trachea midline?
	  • Pushed away from abnormality (pleural effusion, tension pneumothorax)
	  • Pushed toward the abnormality (atelectasis)
	• Check for widening mediastinum: masses, inflammation, trauma, hematoma, aneurysms

Continued

Step-by-Step Approach to Reading a Chest X-ray—cont'd

Factor	Appropriate Considerations
Bones	• Check for fractures or lesions: ribs, clavicle, thoracic spine • Check soft tissues: surgical clips, foreign bodies, subcutaneous air • Caution: nipple shadows can appear as nodules
Cardiac	• Check size (increased in cardiomyopathy and heart failure) • Heart size greater than 50% width of antero-posterior is considered abnormal • Check borders • Check aortic notch
Diaphragm	• Right should be higher than left • If much higher, consider effusion, collapse, or diaphragmatic paralysis • If upright, consider free air under diaphragm and intra-abdominal perforation
Effusion/Esophagus	• Look for blunting at the costophrenic angle

Fields (lung)	• Look for:
	  • Granulomas
	  • Pneumothorax
	  • Nodules
	  • Effusions
	  • Consolidations
	  • Kerley B signs (thin linear pulmonary opacities caused by fluid or cellular infiltration into the interstitium of the lungs suggestive of heart failure, pulmonary edema, or pulmonary fibrosis)

Gastric bubble	• May indicate hiatal hernias

Abnormal Vaginal Bleeding

Important history findings	• Assess menstrual cycle history and history of possible pregnancy, miscarriage, or induced abortion:
	  • Menarche
	  • Last normal menstrual period
	  • Prior normal menstrual periods (menopause date onset, symptoms since, any hormone or other therapy, use of OTC supplements/soy, history of hyperplasia/surgical or other treatments)
	• Abnormal uterine bleeding common in new menarche girls; perimenopausal women; and women with anovulation from excessive exercise, stress, weight loss or gain, depression, and anxiety. Must rule out other causes of serious conditions.

Physical assessment	• Complete physical assessment and vital signs
Differential diagnosis	• Pregnancy, systemic illness (thyroid or adrenal abnormality, diabetes, obesity, blood dyscrasias or clotting abnormalities, liver disease, renal disease); tumors, polyps, trauma, cancer (reproductive tract, urinary tract, colorectal, lymph); STIs/PIDs; pharmaceuticals, psychological stress. Bleeding secondary to ovulation at mid-cycle—may be light or heavy with pain
Diagnostic tests	• Serum pregnancy test • CBC • Endometrial biopsy
Medications	• Based on underlying cause If severe anemia, excessive bleeding, positive pregnancy test, postmenopausal spotting or bleeding, or serious medical conditions, refer to obstetrician–gynecologist for medical/surgical management. Life-threatening conditions need emergency attention.

Continued

Other therapies	• Ongoing STI protection—at least for 1 week when drugs started but urge continuation for STI protection
Follow-up	• Follow patient closely based on response to therapy

Acne

Important history findings	• Family history of acne, dietary habits • Steroid use • Lithium or phenytoin use • Stages within the menstrual cycle • Onset, type of lesion, distribution • Oral contraceptives • Stress • What has worked in the past?
Physical assessment findings	• Mild: presence of several papules and pustules, but no nodules • Moderate: several to many papules and pustules, along with a few to several nodules • Severe: numerous or extensive papules and pustules and many nodules • Acne also is classified by type of lesion: comedonal, papulopustular, and nodulocystic
Differential diagnosis	• Cellulitis • Dermatitis • Eczema • Rosacea • Steroid rosacea • Molluscum contagiosum • Folliculitis
Diagnostic tests	• None indicated

Continued

Medications	• Benzoyl peroxide: applied twice daily • Sulfacetamide/sulfur lotion: applied twice daily • Erythromycin cream 2%: applied twice daily • Clindamycin gel 1%: applied twice daily • Retin A: applied once daily or once every other day • Tazarotene 0.05%: applied once daily • Doxycycline 50–100 mg: applied twice daily or tetracycline 250 mg qid • Isotretinoin (Accutane) 0.5–2 mg: applied twice daily
Other therapies	• Over-the-counter products may be used as primary or adjunctive treatments

Alzheimer's Disease

Important history findings	• Progressive permanent decline in cognitive functioning and memory • History of cognitive impairment: gradual or sudden • Details of sleep–wake cycle • Decreased appetite • Lack of pleasure • Melancholy mood • Medication history • Past medical history • Alcohol abuse
Physical assessment findings	• Observe gait, affect, and dress. • Measure vital signs. • Complete mental status exam. • Examine eyes for papillary response to light, extraocular movements. • Check function of cranial nerves. • Palpate thyroid for enlargement. • Auscultate for carotid bruit. • Examine patient for abnormal movements, tremors, focal weaknesses. • Assess for sensation. • Perform deep tendon reflex and plantar response.

Continued

Differential diagnosis	• B12, folate deficiency • Seizures • Delirium • Psychosis • Depression • Infection • Dehydration • Brain lesion
Diagnostic tests	• CBC • Urinalysis • Chest x-ray • Serologic tests for syphilis • B_{12} and folate levels • TSH (thyroid profile) • Complete metabolic panel • CT scan or MRI Cognitive testing is recommended. This is often undertaken by a neuropsychologist.
Medications	• Cholinesterase inhibitors Razadyne (galantamine), Exelon (rivastigmine), Aricept (donepezil) • Namenda (memantine) These drugs may be used in combination.
Other therapies	• Vitamin E, D, and A • Cognitive stimulation therapy Provide calm atmosphere where the patient feels safe and secure. Leave reminders in places where the patient will look for things.
Follow-up	• It is important for the health care provider to monitor the health of the caregiver.

Angina

Important history findings	• Chest pain either on exertion or at rest • Burning, heavy feeling in chest • Nausea or indigestion • Shortness of breath • Short of breath while seated • Numbness or tingling
Physical assessment findings	• Few physical findings to stable angina • Electrocardiogram may show some T-wave changes
Differential diagnosis	• GERD • Costochondritis • Dyspepsia
Diagnostic tests	• Stress test • Electrocardiogram • Blood work: complete blood count, electrolytes, liver and kidney function
Medications	• Nitroglycerine sublingual. If patient takes a nitro tablet with no response, he or she should take another. After three tablets and no relief of pain, patient should go to the ED. • Nitroglycerine spray (in place of sublingual) • Beta blockers • Calcium channel blockers
Other therapies	• Angioplasty • Coronary artery bypass surgery • Aspirin 81 mg to keep clots from forming
Follow-up	• For stable angina, see patients every 3 months unless symptoms worsen. • For unstable angina, patient should be sent to the ED.
Red flags	Unstable angina: pain unrelieved by rest. Should be sent to the ED.

Anorexia Nervosa/Bulimia

Important history findings	• Seriously underweight: less than 85% of expected weight • Depressed affect • Fear of looking fat • Difficulty interacting with others • Irritability • Decreased concentration • Decreased ability to sleep • Obsessed with food and thoughts of food • Rigid ideas • Overemphasis on exercise • 95% of patients are female, and disorder usually manifests during early adolescence • Caucasians more often affected • Occurs more often in upper socioeconomic group
Physical assessment findings	**Diagnostic criteria for anorexia or bulimia** The refusal to maintain body weight at or above a minimally normal weight for age and height. Body weight less than 85% of the expected weight is considered minimal. • An intense fear of gaining weight or becoming fat, even though the person is underweight • Self-perception that is grossly distorted and weight loss that is not acknowledged • In women who have already begun their menstrual cycle, at least three consecutive periods are missed (amenorrhea) or menstrual periods occur only after a hormone is administered A subtype of anorexia nervosa is binge-eating/purging, in which the individual regularly engages in binge eating or purging behavior that involves self-induced vomiting or the misuse of laxatives, diuretics, or enemas during the current episode of anorexia.

Continued

	Other physical findings may include: • Cardiac arrhythmia • Constipation • Decreased bone density • Anemia • Electrolyte imbalance • Fine, downy hair on extremities • Dry, flaky skin that is yellow tinged • Brittle hair and nails • Erosion of dental enamel if binging and vomiting
Differential diagnosis	Other psychological problems: • Depression • Anxiety • Affective mood disorders Gastrointestinal parasite
Diagnostic tests	• Complete metabolic panel to evaluate electrolytes and renal function • BMI calculation
Medications	• No medications are currently available for anorexia or bulimia, but antidepressants may help to some degree
Other therapies	• May be treated in an outpatient setting but often requires hospitalization • Intense psychotherapy for the patient and the patient's family • Careful monitoring for weight and eating habits
Follow-up	• Follow-up is aimed at continuing psychotherapy and monitoring weight and eating habits

Asthma

Important history findings	• Shortness of breath • Recent upper respiratory infection • Symptoms that worsen at night • Chest tightness • Cough with clear sputum • History of atrophic diseases and allergies

Continued

Physical assessment findings	• Use of accessory muscles for breathing • Decreased breath sounds • Expiratory wheeze • Cyanosis • Diaphoresis • Tachycardia • Difficulty breathing while sitting in tripod position • Use of accessory muscles for breathing • GERD or symptoms
Differential diagnosis	• Bronchitis • Pneumonia • COPD • Allergic reaction • Foreign body • Decreased peak expiratory volume
Diagnostic tests	• Chest x-ray • Spirometry or peak flow expiratory flow rate

Medications	• Medications to prevent exacerbations
	  • Leukotriene modifiers
	  • Cromolyn
	  • Methylxanthines
	• Multidose inhalers or dry powder inhalers
	  • Short-acting bronchodilator (albuterol)
	  • Long-acting bronchodilator (salmeterol)
	  • Prednisone—first-line treatment
	• **Oral prednisone:** 10 mg tid × 5 days
	• **Combination drugs:** Bronchodilator + prednisone
	• Emergency drugs:
	  • Epinephrine
	  • Ipratropium bromide
	For full treatment guidelines go to www.nhlbi.nih.gov/guidelines/asthma/index.htm

Other therapies	• Spacer with multidose inhalers • Air filters • Oxygen

Continued

Follow-up	• After initial diagnosis follow up in 1 week to 10 days. • Step up therapy if patient awakens at night with symptoms, has urgent care visit, has an increased need for short-acting beta$_2$ agonist, or uses more than one canister of short-acting beta$_2$ agonist a month.
Red flags	If asthma symptoms awaken patient at night and the patient experiences severe shortness of breath, patient should go to ED.

Back Pain

Important history finding	• Precipitating factors • Is pain worse with movement?
Physical assessment findings	• Pain on palpation with muscle pain • Tingling in extremities with radiculopathy • Pain on straight leg raise with disc pain • Pain at sciatic notch with sciatic nerve pain
Differential diagnosis	• Pyelonephritis appendicitis • Metastatic disease of the bone • Osteomyelitis • Abdominal aneurysm • Peripheral neuropathy • Cystitis • Prostatitis • Endometriosis • Osteoarthritis • Bursitis • Osteoporosis • Cauda equina syndrome
Diagnostic tests	• MRI • X-ray of spine
Medications	• Ibuprofen or acetaminophen • Muscle relaxants • NSAIDs
Other therapies	• Acupuncture • Physical therapy • Arch supports

Continued

Other therapies (cont'd)	• Massage • Ice or heat • Exercise (gentle stretching) • Referral to orthopedist, chiropractor, or pain management physician
Follow-up	• Return to office if no improvement after 2 weeks.
Red flags	Cauda equina syndrome is suspected if the patient has loss of bladder or bowel function. This is a medical emergency.

Bacterial Vaginosis

Important history findings	• History of multiple sexual partners
Physical assessment findings	• Vagina appears pale with adherent white or grayish homogenous discharge on vaginal walls; may or may not have obvious fishy odor
Differential diagnosis	• Trichomonas, trimethylaminuria • Foreign body in vagina • Vulvovaginal • Candidiasis • Atrophic vaginitis • Dermatitis • HIV disease
Diagnostic tests	• Thin, white, gray, or white–yellowish homogenous discharge that adheres to vaginal walls • Positive whiff test • Clue cells • HIV tests • Pregnancy
Medications	• **Nonpregnant female:** Metronidazole at bedtime × 7 nights OR intravaginal metronidazole gel 0.75% 1 applicator full (5 g) qd × 5 days
Other therapies	• Treating male partners not advised by CDC; condom use decreases risk.

Continued

Follow-up	• Follow-up for recurrent infection diagnosis and treatment. Recurrence is common: up to 30% of treated women. Most recurrences occur in the first year, especially if new partner. Refer or consult if recurrent or chronic infection.

Bipolar Disorder

Important history findings	**Definition**: recurrent episodes of depression and hypomania • At least one manic or mixed episode is required to make a diagnosis of bipolar disorder • Periods of sustained euphoria and grandiosity • Depressed mood • Mood lability • Pressured speech • Psychomotor agitation • Hypersexuality • Religiosity • Distractibility • Impaired insight
Physical assessment findings	• Weight loss or gain • Psychomotor agitation • Inability to concentrate • Recurrent suicide ideation • Inflated self-esteem
Differential diagnosis	• Depression • Anxiety • Dysthymia • Brain tumor • Psychosis
Diagnostic tests	• Have patient complete the Mood Disorder Questionnaire
Medications	• Lithium: needs monitoring for therapeutic level • Chlorpromazine (Thorazine) • Divalproex (Valproate): needs monitoring for therapeutic level

Continued

Medications (cont'd)	• Olanzapine (Zyprexa) • Aripiprozole (Abilify): Has caused fatal heart attack and stroke in older adults with dementia-related conditions.
Other therapies	• Psychotherapy should accompany pharmacologic treatment for bipolar disorder as with all depressive disorders.
Follow-up	• One week after initiation of new medication to determine efficacy and patient condition

Benign Prostatic Hypertrophy

Important history findings	• **Risk factors:**
	  • Aging: 50% of patients older than 50 years and 80% of patients older than 80 years have BPH
	  • Family history
	  • African American descent
	  • Functioning testes
	• **Symptoms depend on cause:** dribbling after voiding, hard to stop urine stream, urine retention, frequency, nocturia, incontinence, urgency, dysuria

Physical assessment findings	• DRE reveals firm, smooth, elastic, enlarged gland (larger than walnut size) • May find hematuria (older than 60 years), weak urine stream, distended bladder (>150 cc), and postvoid residual volume >100 mL
Differential diagnosis	• Neurogenic bladder • Neoplasm • Bladder cancer • Bladder calculi • Prostatitis • Urethritis • UTI
Diagnostic tests	• Urinalysis (for hematuria, infection) • PSA • Serum creatinine

Continued

Medications	• Alpha$_1$-adrenergic agonists and 5-alpha-reductase inhibitors (take up to 6 months to work). Combining terazosin and finasteride may work best long term, not short term. Start with alpha blockers first.
Other therapies	• Advise avoiding all spicy foods, alcohol, and caffeine. • Some supplements may be used, such as saw palmetto, nettle, pygeum.
Follow-up	• PSA once per year • DRE once per year • Biopsy may be indicated
Red flags	Inability to urinate is an emergency. Send to ED for catheterization

Cataracts

Important history findings	• Decreased vision; glare, especially when person looks at a point of light (can interfere with night driving) • Visual distortion with straight edges appearing wavy or curved, double vision • Altered color perception with loss of contrast sensitivity
Physical assessment findings	• Decreased visual acuity on Snellen chart • Pupil reaction to light is unaffected by cataracts • Absence of red reflexes with ophthalmoscope examination
Differential diagnosis	• Macular degeneration • Diabetic retinopathy • Glaucoma
Diagnostic tests	• No diagnostic tests
Medications	• None
Other therapies	• Refer to ophthalmologist for surgical removal of cataracts. This has become an outpatient procedure and can be completed early in the development of cataracts.
Follow-up	• After surgery
Red flags	Eye pain is always a red flag and is not a symptom of cataracts.

Chlamydia Trachomatis

Important history findings	• **Women:** often asymptomatic or nonspecific; may c/o vaginal discharge (MCP) • **Men:** often asymptomatic; cloudy/thick penile discharge
Physical assessment findings	• **Women:** no abnormal findings or cervical MCP discharge • **Men:** no findings common; testicular pain if infection ascended
Differential diagnosis	• **Women:** Gonorrhea, mucopurulent cervicitis, salpingitis, PID, cystitis • **Men:** Gonorrhea, nongonococcal urethritis
Diagnostic tests	• Wet mount • Chlamydia swab testing
Medications	• Azithromycin 1 g PO single dose **or** doxycycline 100 mg PO bid × 7 days • Alternates: erythromycin **or** ofloxacin
Other therapies	• Screen and treat partners • Abstention from sexual activity until treatment completed
Follow-up	• Retest if persistent symptoms and 3 weeks after erythromycin therapy
Red flags	Long-term infection from chlamydia can cause infertility in women

Chronic Obstructive Pulmonary Disease

Important history findings	• History of cigarette smoking or exposure to toxic substances such as asbestos • Dyspnea on exertion • Cough • Fatigue • Infections
Physical assessment findings	• Respiratory distress with exertion • Increased anterior–posterior diameter of chest • Retractions

Continued

Physical assessment findings (cont'd)	• Accessory muscle use for breathing • Pursed lip breathing • Wheezes, decreased breath sounds, prolonged expiratory time • Weight loss
Differential diagnosis	• Asthma • Congestive heart failure • Acute bronchitis • Bronchiolitis
Diagnostic tests	• Spirometry • Pulmonary function studies • Chest x-ray • Arterial blood gases • CBC with differential • Electrocardiogram
Medications	• **Mild COPD:** short-acting beta$_2$ agonist • **Moderate COPD:** anticholinergic agent (ipratropium bromide), short-acting beta$_2$ agonist, and long-acting beta$_2$ agonist. Theophylline is also effective but has toxicity potential and many drug interactions. • **Severe COPD:** refer to pulmonology if possible. Add a cortisone inhaler for short course of 3 months.
Other therapies	• Smoking cessation • Pneumococcal vaccine • Influenza vaccine yearly • Elimination of environmental irritants • Avoidance of sedating drugs, beta blockers, and antihistamines
Follow-up	• See patient at least every 3 months for follow-up if stable

Depression

Important history findings	• Despondency • Anhedonia (inability to feel pleasure) • Insomnia or hypersomnia • Weight gain or loss • Feelings of doom or dread • Loss in desire to complete usual activities • Psychomotor agitation or restriction • Loss of energy • Feelings of worthlessness • Inability to concentrate • Recurrent suicidal ideation
Physical assessment findings	• Sad affect • Weight loss or gain • Signs of fatigue
Differential diagnosis	• Organic mood disorder • Schizophrenia • Grief • Substance abuse • Dementia
Diagnostic tests	• Depression scale • Complete physical workup
Medications	• **Selective serotonin reuptake inhibitors:** fluoxetine (Prozac), fluvoxamine (Luvox), paroxetine (Paxil), and sertraline (Zoloft). Low danger from overdose; however, these drugs are not recommended for adolescents or children. • **Serotonin–norepinephrine reuptake inhibitors:** venlafaxine (Effexor or Effexor XR), desvenlafaxine (Pristiq), duloxetine (Cymbalta), and bupropion (Wellbutrin). • **Tricyclic antidepressants:** amitriptyline (Elavil), amoxapine (Ascendin), clomipramine (Anafranil), desipramine (Norpramin), and doxepin (Sinequan). These drugs have anticholinergic effects that can be detrimental, especially in older adults. Overdose can be life threatening. • **MAO inhibitors:** Best prescribed by psychiatrists because they are difficult to manage, have many side effects, and interact with many other medications.

Continued

Other therapies	• Psychotherapy (essential for all patients) • Biofeedback • Behavior modification • Group therapy
Follow-up	• Follow up 1–2 weeks after newly prescribed antidepressant.
Red flag	Any patient who has suicidal ideation and a plan to carry out the suicide should be hospitalized immediately to prevent self-harm.

Diabetes, Type II

Important history findings	• Family history of Type II diabetes • Obesity • Fatigue • Frequent infections • Wounds that are slow to heal • Erectile dysfunction • Changes in vision • Flulike symptoms • Red, swollen gums • For women: history of gestational diabetes
Physical assessment	• Few physical assessment symptoms are present with Type II diabetes • Frequent yeast infections • Sores that are slow to heal • Overweight
Differential diagnosis	• Hyperglycemia from stress or steroid use • Cushing's syndrome • Pheochromocytoma • Trauma, burns, or infection
Diagnostic tests	• FBS • Glucose tolerance test • Glycosylated hemoglobin • Cholesterol level • Blood pressure • Funduscopic exam • Home glucose monitoring • EKG

Continued

Medications	• **Sulfonylurea:** Can cause hypoglycemia. Cannot give to people allergic to sulfa. • **Meglitinides:** These drugs are taken at the beginning of 3 meals daily and can cause hypoglycemia. • **Biguanides:** Decrease the amount of sugar produced by the liver and sensitized muscle tissue cell receptors to insulin. Cannot be taken with renal insufficiency or failure or when dyes excreted through the kidney are given. • **Thiazolidinediones:** Sensitize the insulin receptors of both muscle and fat cells. Monitor for liver enzyme elevation and heart disease. • **DPP-4 inhibitors:** Prevent the breakdown of compounds in the body that increase glucose levels. These drugs reduce blood glucose and may have a positive effect on cholesterol. • **Alpha-glucosidase inhibitors:** Decrease absorption of carbohydrates. • **Incretin mimetics:** Naturally occurring hormones that lower blood glucose levels primarily by increasing insulin secretion. It is an injection. Primary side effect is nausea. • **Insulin:** Used once the pancreas is no longer able to produce adequate amounts of insulin.
Other therapies	• Chromium picolinate: improves carbohydrate metabolism • Magnesium: low magnesium levels worsen blood glucose levels • Vanadium: sensitizes receptors on the cell to insulin • Diet teaching (ADA diet) • Foot care • Referrals to other health care practitioners, such as an ophthalmologist, dentist, and podiatrist
Follow-up	So much teaching and education are needed that these patients will have to come back several times after being diagnosed. • One week after beginning medications, repeat FBS • HgbA1C every 3 months • Referrals should be made to ophthalmology, podiatry, and dentist

Gastroesophageal Reflux Disease

Important history findings	• Heartburn • Antacid use • Smoking • Recent weight loss • Blood in stool • Excessive alcohol intake • Family history of GERD • Sore throat • Hoarseness • Asthma • Cough • Difficulty swallowing • Unexplained lung infections • Anemia—from bleeding ulcerated esophagus
Physical assessment findings	• Trace to moderate tenderness when epigastric area is palpated
Differential diagnosis	• Cardiac chest pain • Esophagitis • Esophageal motility or structural disorders • Peptic ulcer disease • Esophageal tumor
Diagnostic tests	• Generally none are indicated, but in patients with severe GERD barium swallow may be indicated.
Medications	• Antacids • Histamine antagonists • Protein pump inhibitors
Other therapies	• Lifestyle changes, including weight loss, drinking alcohol only in moderation, smoking cessation, sleeping at a 45-degree angle, and avoiding lying down for 3 hours after eating • Avoidance of chocolate, caffeine, peppermint, fatty foods, and alcohol
Follow-up	• In 2 weeks to evaluate treatment and assess GERD symptoms

Genital Herpes

Important history findings	• Sexual history • Prior episodes of herpes
Physical assessment findings	• Painful vesicular lesions with erythematous base on genitalia, buttocks, thighs, nipples, cervix that break to form coalesced painful ulcers • Painful exam • Possible urinary retention with distention, cervicitis (female), urethritis (male), inguinal adenopathy; note excoriations/fissures • Recurrence: less severe, similar
Differential diagnosis	• Chancroid • Syphilis • Granuloma inguinale • Lymphogranuloma inguinale • Yeast infection • Vaginitis • UTI • Urethritis • Urethral syndrome • Contact dermatitis • Hemorrhoids • Shingles • Skin irritation
Diagnostic tests	• Virology cell culture in first 3–4 days after onset
Medications	• Acyclovir or similar drug • Topical antiviral agent use with oral drug may speed healing/decrease shedding
Other therapies	• Comfort measures • Teach patient about disease
Follow-up	• As indicated by patient needs

Glaucoma

Important history findings	• Decreased midperipheral field of vision • For closed-angle glaucoma (a relatively rare condition), unilateral headache on the same side as the affected eye, visual blurring, nausea, and photophobia
Physical assessment findings	• Eye for swelling, ptosis, injection of conjunctiva, tearing, and corneal clarity • Normal intraocular pressure of 10–20 mm Hg
Differential diagnosis	• Conjunctivitis • Acute uveitis • Macular degeneration • Cataracts
Diagnostic tests	• Tonometry exam to measure eye pressure • Visual field test—loss of visual field as a result of damage to the optic nerve • Use direct confrontation to measure peripheral vision • Funduscopic exam—difference in cup-to-disc ratio between the two eyes
Follow-up	• Follow-up with ophthalmologist is required usually at 6 months.
Red flags	Exhibiting signs and symptoms of acute closed-angle glaucoma is a medical emergency.

Gonorrhea

Important history findings	• Sexual history • STI history
Physical assessment findings	• **Females:** abdominal guarding/referred pain; upper quadrant pain; vaginal wall erythema; cervical ectopy, friability; adnexal tenderness, mass; uterine tenderness • **Males:** urethral discharge; possibly testicular pain if infection ascended • **Both genders:** throat/tonsil erythema; perianal tenderness/purulent discharge

Continued

Differential diagnosis	• **Females:** Chlamydia, ectopic pregnancy, appendicitis • **Males:** Chlamydia, nongonococcal urethritis
Diagnostic tests	• Gonococcal culture (gold standard) • Other polymerase or ligase chain reaction test (PCR or LCR)
Medications	• If uncomplicated: ceftriaxone 125 mg IM × 1 dose OR cefixime 400 mg PO × 1 dose (if female, not younger than age 18) OR ofloxacin 400 mg PO × one dose OR levofloxacin 250 mg PO × 1 dose
Other therapies	• Evaluate and treat all sexual contacts • Teach about disease, transmission, protection, avoiding sexual contact until both patient and partner(s) treated, using protection (condoms)
Follow-up	• If symptoms continue, recur, or worsen, follow up with culture.

Headache

Important history findings	• Tension headache: pain in neck and occipital area. Vicelike feeling around head with throbbing. Pain becomes more intense as day progresses. • Migraine: may have aura prior to start of headache. Severe throbbing, pounding pain with sensitivity to light (photophobia), noise (phonophobia), or odors; mental dullness; nausea; vomiting; and abdominal pain. Migraines tend to run in families. • Cluster: Occurs most often in adult males with burning, piercing pain, severe enough that person cannot usually sit still. Causes tearing and eye irritation. May occur several times a day. Cluster headaches often wake the patient at night. There is a pattern of remission and exacerbation. • Sinus: deep and constant pain on face, across bridge of nose, cheekbones, and forehead. May have nasal discharge, feeling of fullness in ears, and fever. • Post-trauma: changes in cognition, mood, personality, and sleep patterns. Head, neck, and shoulder pain with dizziness and vertigo. • Rebound: caused by overuse of medications especially analgesics. Headache corresponds to taking drugs.

Continued

Physical assessment findings	• Tension: tenderness in neck and shoulder area. Evidence of stress either physical or emotional. • Migraine: few physical signs other than those expressed by patient in history • Cluster: stuffy nose, runny eyes, fever, restlessness, temporal swelling and tenderness; sweatiness • Sinus: fever, bulging tympanic membranes, runny nose, eye pain • Post-trauma: visual changes, decreased cognition and memory, evidence of trauma to skull or face • Rebound: signs come mainly from history of analgesic overuse
Differential diagnosis	• Infection • Otitis media • Tooth decay • CVA • Brain lesion
Diagnostic tests	• CT or MRI for suspected brain lesion, or CVA • CBC to detect increased white count in sinus infection or cluster headache • Snellen chart test to test for changes in visual acuity
Medications	• Tension: analgesics (ibuprofen, acetaminophen), tricyclic antidepressants. • Migraine: nonsteroidal anti-inflammatories, serotonin agonists (sumatriptan), ergotamines • Cluster headache: serotonin agonists, ergotamines, methysergide • Sinus: short steroid burst to decrease inflammation, antihistamine for runny nose • Post-trauma: repair damage from trauma
Other therapies	• Tension: exercise, stress management • Migraine: trigger avoidance • Cluster: oxygen therapy • Sinus: breathing in steam
Follow-up	• As needed
Red flags	Changes in vision, extreme vertigo, loss of memory or cognitive changes, or very painful stiff neck all may indicate serious disease of the brain that should be investigated.

Hepatitis A

Important history findings	• Transmission mode: fecal/oral usually sudden onset; loss of appetite, nausea, vomiting, fatigue, muscle/joint aches, fever, chills possible, flu symptoms, diarrhea or constipation, recurrent or intermittent RUQ or epigastric abdominal pain; jaundice, urine dark, stools light. Not chronic disease. Incubation 4–6 weeks.
Physical assessment findings	• Ill appearance • Jaundiced, icteric sclera • Rhonchi/wheezing • Fever • Nasal discharge • Pharyngitis • Tachycardia • Abnormal bowel sounds • Hepatomegaly • RUQ or diffusely tender abdomen • Possible splenomegaly • Tender, possibly swollen joints • Lymphadenopathy
Differential diagnosis	• Infectious mononucleosis • Cytomegalovirus
Diagnostic tests	• Hepatitis screening panel: HAV-IgM antibody (IgM anti-HAV); HBV surface antigen (HBsAg), HBV core antibody (anti-HBc), HCV core antibody; urinalysis; total and direct bilirubin; liver function tests. Rule out mononucleosis, CMV, HIV.
Medications	• Preventive HAV vaccine for travelers, children in day care, and other risk groups
Other therapies	• Good hygiene and hand washing after toileting or changing a diaper • Correct disposable glove use for food handlers • Nausea and vomiting therapy as indicated • No alcohol for 6–12 months
Follow-up	• ALT normal in 12 weeks. May relapse in first year, then recover completely. Not generally lethal; no lasting sequelae

Hepatitis B

Important history findings	• History of transmission by blood and body fluids
	• High-risk history:
	  • Homosexual male
	  • IV drug user
	  • Previous infection with HCV or HIV
	  • Immigrant
	  • Multiple sexual partners
	  • Health care personnel exposed to blood, blood products, needle sticks
	  • Patients receiving hemodialysis

Physical assessment findings	• Ill appearance: jaundiced skin, sclera, mucosa • Fever • Malaise • Hepatomegaly, RUQ or diffusely tender abdomen • Possible splenomegaly • Tender, possibly swollen joints • Lymphadenopathy
Differential diagnosis	• Infectious mononucleosis • Cytomegalovirus • Gallbladder disease • Liver cancer • Acute fatty liver of pregnancy
Diagnostic tests Diagnostic tests (cont'd)	• Hepatitis screening panel: HAV-IgM antibody (IgM anti-HAV) • HBV surface antigen (HBsAg) • HBV core antibody (anti-HBs) • HCV core antibody (anti-HCV) **If positive:** • HBsAg: HBeAg, anti-HBe, HBV DNA • Other: urinalysis, total and direct bilirubin, liver function tests • Rule out mononucleosis, CMV, HIV
Medications	• HBV vaccine series (pretest for anti-HBs); lasts at least 10 years; postexposure prophylaxis: HBIg (2 doses a month apart); monitor for chronic HBV; therapy consists of interferon with ribavirin or alternative viral agents

Continued

Other therapies	• No alcohol for 6–12 months • Nutritious diet • Good hygiene • Restricted activity in acute phase • Teaching about disease, transmission, prevention, and protection • No sharing razors or toothbrushes
Follow-up+	• Ongoing evaluation and HBV testing for chronicity

Human Papillomavirus (HPV)

Important history findings	• **Both genders:** young age (15–29 years old) at higher risk
Physical assessment findings	• **Men:** flesh-colored or pink and soft small single or grouped papules or warts on penis, scrotum, perineum, anus, groin, inner thighs, buttocks, oral mucosa, and other nongenital areas • **Women:** flesh-colored or pink and soft small single or grouped papules or warts on mons, vulva (labia, around clitoris, vestibule), perineum, anus, inner thighs, buttocks, oral mucosa, other nongenital areas, vaginal walls, cervix
Differential diagnosis	• Syphilis (flat warts—condylomata) • Molluscum contagiosum • Herpes simplex • Carcinoma • Melanoma • Adenomas • Lipomas • Fibromas • Seborrheic keratoses • Skin tags • Other noncancerous lesions such as psoriatic plaques
Diagnostic tests	• Pap smear or liquid-based test

Continued

Medications	• **Patient-applied therapy:** Topical to lesions: imiquimod 5% podofilox 0.5% gel/solution • **Provider-applied therapy:** *Vaccine Gardisil:* 3-dose series approved for females aged 9–26; males being considered by FDA; start before sexual activity onset; have even if prior infection; teach regarding side effects; do not use if pregnant
Follow-up	For warts: weekly exams until lesions resolved

Hyperlipidemia

Important history findings	• Family history of hyperlipidemia • Eastern European Jewish heritage • Past history of hyperlipidemia
Physical assessment findings	• Deposits of cholesterol (called xanthomas) • Pimplelike rash across the body from high triglycerides • Pancreatitis
Differential diagnosis	• Lipoma (for cholesterol deposit) • Abdominal differentials for pancreatitis
Diagnostic tests	NCEP or ATP III set the guidelines for diagnoses of hyperlipidemia: www.nhlbi.nih.gov/guidelines/cholesterol/ **Lipid profile** • **Total cholesterol:** normal <200 mg/dL • **LDL:** optimal level less than 100 mg/dL (less than 70 in those with cardiovascular risk factors) • **HDL (optimum level):** men > 40, women >50 • **Triglycerides (optimum level):** <150 mg/dL If triglycerides >400 mg/dL, LDL cannot be calculated. • **Very LDL:** optimal between 5 and 40 mg/dL
Medications	• HMG-CoA reductase inhibitors (statins) • Other agents commonly added to statins: bile acid sequestrants, niacin, and ezetimibe • Fibrates, effective for lower triglycerides Combination use of statins and fibrates, although highly effective, greatly increases the risk for myopathy and rhabdomyolysis.

Continued

Other therapies	• Omega 3 fatty acids • Red rice yeast (*Monascus purpureus)*, which has been shown to have a cholesterol-lowering effect
Follow-up	• Follow-up appointment in 8–12 weeks to measure lipids again. Measure ALT to rule out developing hepatotoxicity. Measure creatinine levels on persons with muscle or joint pain. Once target has been met and liver function is stable, yearly follow-ups are sufficient.
Red flags	Muscle and joint pain could indicate rhabdomyolysis, which is a life-threatening complication. Creatinine and CPK levels are diagnostic for rhabdomyolysis.

Hypertension

Important history findings	• Confirmation of hypertension is based on the initial visit, plus two follow-up visits with at least two blood pressure measures at each visit. • Family history of hypertension, cardiovascular disease, cerebrovascular disease, diabetes mellitus, or dyslipidemia • History of organ disease in heart, lungs, kidneys, peripheral vascular disease, brain (stroke or dementia), retinopathy, and secondary hypertension • Presence of risk factors such as age older than 55 years, diabetes mellitus, elevated LDL and cholesterol, low HDL cholesterol, glomerular filtration rate <60, microalbuminemia, family history of cardiovascular disease, obesity, tobacco use, low levels of physical activity
Physical assessment findings	Two or more blood pressure measurements separated by 2 minutes with the patient seated and after standing for at least 2 minutes **Prehypertension** • SBP from 120 to 139 mm Hg and DBP from 80 to 89 **Stage one hypertension** • SBP 140–59 mm Hg and DBP 90–99 mm Hg

Continued

Physical assessment findings (cont'd)	**Stage two hypertension** • SBP >160 mm Hg and DBP >100 mm Hg Other physical assessment findings include: • Measurement of height, weight, and waist circumference • Funduscopic examination for hypertensive retinopathy, such as arteriolar narrowing, focal arteriolar constrictions, arteriovenous crossing changes, hemorrhages and exudates, and disc edema • Examination of the neck for carotid bruits, distended veins, or an enlarged thyroid gland • Examination of the heart for abnormalities in rate and rhythm, increased size, precordial heave, clicks, murmurs, and third and fourth heart sounds
Differential diagnosis	Chronic kidney disease or obstructive uropathy • Thyroid and parathyroid disease • Drugs, excessive alcohol • Obstructive sleep apnea • Primary aldosteronism • Renal artery stenosis • Pheochromocytoma • Cushing's syndrome • Aortic stenosis • Obesity
Diagnostic tests	Initial lab screen should include: • 12-lead electrocardiogram • Urinalysis • Fasting blood glucose • Hematocrit • Serum sodium, potassium, creatinine (or estimated or measured GFR) • Calcium • Lipid profile (total cholesterol, HDL cholesterol, LDL cholesterol, and triglycerides). Additional laboratory and diagnostic studies may be required in individuals with suspected secondary hypertension or evidence of target-organ disease.

Continued

Medications	• A thiazide-type diuretic should be considered as initial therapy in most patients with uncomplicated hypertension. • Other classes of medications that should be used in combination to meet BP goals include beta-adrenergic blockers, angiotension-converting enzyme inhibitors, angiotension receptor blockers, and calcium channel blockers.
Other therapies	• Weight reduction • Decreased alcohol intake • Increased physical activity • Decreased dietary sodium intake • Avoidance of tobacco • Relaxation and stress management
Follow-up	• Accurate home blood pressure monitoring is an important tool in blood pressure control.

Hypothyroidism

Important history findings	• Fatigue • Depression • Modest weight gain • Cold intolerance • Excessive sleepiness • Dry, coarse hair • Constipation • Dry skin • Muscle cramps • Increased cholesterol levels • Decreased concentration • Vague aches and pains • Increased or decreased duration and occurrence of menstrual periods
Physical assessment findings	• Leg swelling • Dry skin • Weight gain

Continued

Differential diagnosis	• Ischemic heart disease • Nephrotic syndrome • Cirrhosis
Diagnostic tests	• Thyroid panel: TSH, T_3 and T_4, possibly free T_4 • Complete metabolic panel • Urine pregnancy test • Urinalysis to detect proteinuria • Lipids
Medications	• Synthroid or Levoxyl are thyroid hormone replacements that can be taken orally. Usually start with 50 μg in younger healthy people or 25 μg in older persons or in those with chronic comorbidities. Recheck TSH in 1 month; if still elevated, increase thyroid hormone slowly.
Other therapies	• No other therapies available or necessary
Follow-up	• Recheck TSH 1 month after medication change. Then, unless symptoms change, recheck yearly.

Interstitial Cystitis

Important history findings	• Noninfectious chronic inflammatory bladder syndrome • More common in women (90%; 1 in 4.5 versus 1 in 11 men) • May c/o frequent UTIs with no treatment relief, migraine or frequent headaches, constipation, irritable bowel syndrome, seasonal allergies, heartburn, fibromyalgia, depression • History of seeing many clinicians without relief
Physical assessment findings	• Complete PE advised: check for abdominal/vulvar trigger points; pelvic examination with careful evaluation of base of bladder, muscles around bladder and vagina, uterus, adnexa, with rectovaginal

Continued

Differential diagnosis	• Chronic or recurrent bacterial cystitis • Overactive bladder endometriosis • Vulvodynia • Irritable bowel syndrome • Bladder cancer • Depression or anxiety • Fibromyalgia • Renal disorders • STIs • Neurologic or rheumatologic conditions
Diagnostic tests	• *In-office:* Blood work to rule out UTI, diabetes, endometriosis; self-scoring test—Pain and Urgency/Frequency Patient Symptom Scale; score of ≥10 suggests IC).
Medications	• Dimethyl sulfoxide: to reduce inflammation, decrease pain, prevent bladder muscle contractions • Pentosan polysulfate sodium (Elmiron): to help protect bladder lining • Amitriptyline to decrease histamine

Other therapies	• Bladder evaluation training
	• Lifestyle alterations
	  • Diet modification: discuss avoiding foods and substances that irritate bladder
	  • Smoking cessation
	  • Stretching exercises
	• Physical therapy to decrease trigger point pain
	• Stress reduction and relaxation techniques
	• Support group
	• Adequate rest
	• Adequate water intake (64 ounces daily)

Follow-up	• Referral or consultation with specialists as indicated

Methicillin-Resistant *Staphylococcus aureus*

Important history findings	• Pruritic red papules • Boils (like spider bites) • Recent hospitalization or surgery • Long-term care residence • Dialysis • Permanent indwelling catheter or percutaneous medical device • Exposure to someone with MRSA
Physical assessment findings	• Erythematous papules, nodules, or abscesses • Furuncles • Abscesses that progress to cellulitis
Differential diagnosis	• Common skin infections, including impetigo, ecthyma, folliculitis, furunculosis, carbunculosis, cellulitis, erysipelas, paronychia, felon, and necrotizing fasciitis
Diagnostic tests	• Stain or C&S test for lesion drainage
Medications	• Broad-spectrum antibiotics until diagnosis and organism identified
Other therapies	• Compresses to area to promote drainage
Follow-up	• One week to determine whether lesion resolving
Red flags	It is essential to recognize signs and symptoms of serious, rapidly progressing systemic disease and toxicity to prevent septic shock, acute respiratory distress syndrome, and death.

Monilia

Important history findings	• Vulvovaginal itching, burning, edema, dysuria, dyspareunia that worsens nearer to menses • May complain of profuse or scanty thick, white discharge • More common in women with a chronic illness such as diabetes
Physical assessment findings	• White, cottage cheese–appearing discharge with no foul odor • May complain of pain with examination

Continued

Differential diagnosis	• Bacterial vaginosis • Trichomoniasis • Allergic or chemical reaction • Dermatitis • Herpes genitalis, gonorrhea, chlamydia, HIV or other STI
Diagnostic tests	• pH test <4.5 • Normal saline or 10% KOH wet mount shows hyphae or spores or budding yeast cells
Medications	• Multiple therapies available, either by prescription or OTC
Other therapies	• *Self-treatment* with OTC yeast infection therapies Warn patient not to use contraceptive diaphragm, condom, sponge, douche, tampons, or spermicide within 7 days after treatments. Advise abstinence until symptoms are relieved.
Follow-up	• If infection does not respond to therapy, tell patient to return for further evaluation.

Otitis Externa

Important history findings	• Swimming • Warm humid climates • Allergies or psoriasis
Physical assessment findings	• Ear pain that increases when pressure is placed on the tragus or when the penna is moved • Sensation of fullness in the ear • Itching common with fungal infection • Otorrhea: white mucus for acute bacterial; granulation tissue for chronic bacterial; and white, gray, bluish-green, or yellow for fungal
Differential diagnosis	• Otitis media • Mastoiditis • Foreign body in the ear canal • Furunculosis
Diagnostic tests	• Culture exudate

Continued

Medications	• Referral for severe or recurrent infections. Cerumen removal before starting medications. • Polymyxin B sulfate, neomycin, hydrocortisone • Tobramycin dexamethasone (TobraDex) not recommended for children • For children with tympanic membrane that is not intact, use ofloxacin 0.3% solution • For fungal infections: acetic acid, aluminum acetate solution (otic domeboro), clotrimazole (Lotrimin) solution
Other therapies	• Auralgan drops for pain relief
Follow-up	• Not usually required unless pain and symptoms persist
Red flags	Malignant otitis media: otitis media that spreads to the skull. More common in patients with diabetes or who are immunocompromised. Signs include yellow, foul-smelling drainage from ear.

Peptic Ulcers

Important history findings	• Presence, location of epigastric distress or pain • Quality, quantity, and timing of distress or pain • Associated symptoms such as nausea, vomiting, and heartburn • Past medical history for cirrhosis, pancreatitis, arthritis, COPD, hyperparathyroidism • Social history of smoking and stress • Regular nonsteroidal anti-inflammatory drug use or oral corticosteroids • Family history of gastrointestinal ulcers or GERD
Physical assessment findings	• Tenderness in abdominal or epigastric areas • Rigidity • Abnormal bowel sounds • Masses • Liver or spleen enlargement • Rectal exam for tenderness, masses, stool for occult blood

Physical assessment findings (cont'd)	• Duodenal ulcers are more common than gastric ulcers. Duodenal ulcer pain occurs when hungry, whereas gastric ulcer pain occurs immediately after eating.
Differential diagnosis	• Neoplasm of the stomach • Pancreatitis • Diverticulitis • Dyspepsia • Gastroesophageal reflux disease • Esophageal spasm
Diagnostic tests	• Stool for occult blood • Hemoglobin/hematocrit • Barium swallow • Endoscopy • *Helicobacter pylori* test
Medications	• Magnesium-, aluminum-, or calcium-based antacids (Gaviscon, Tums) • Antibiotics if *H. pylori* positive (amoxicillin, clarithromycin, tetracycline, ciprofloxacin, metronidazole) • Bismuth (Pepto-Bismol) • H_2 blockers (Tagamet, Zantac, Pepcid, Axid) • Proton pump inhibitors (PPI): omeprazole (Prilosec), esomeprazole (Nexium), lansopraxole (Prevacid), or rabeprazole (Aciphex) • Sucralfate (Carafate)
Other therapies	• Cessation of NSAID and ASA use • Smoking cessation • Alcohol in moderation only • Stress reduction • Discontinuation of foods associated with distress or pain • Reduced caffeine intake
Follow-up	• Reevaluate symptoms after 2 weeks.
Red flags	Hematemosis is an ominous sign and should be evaluated immediately.

Pharyngitis

Important history findings	• Start of symptoms • Persons in proximity to patient with similar symptoms
Physical assessment findings	• **Bacterial:** erythema, injections, white pustules, fever, malaise, pain with swallowing • **Viral:** erythema, cobblestone appearance to throat, fever, malaise, pain with swallowing
Differential diagnosis	• Peritonsilar abscess • Mononucleosis
Diagnostic tests	• Throat culture • CBC
Medications	• Antibiotics for bacterial infection • Supportive therapy for both bacterial and viral
Other therapies	• Saltwater gargle • Vitamin C • Cool liquids • Rest • Ibuprofen • Acetaminophen for fever and malaise
Follow-up	• None required unless symptoms persist

Pneumonia

Important history findings	• Recent upper respiratory infection • Abrupt onset of high fever, shaking chills, productive cough with purulent or rusty sputum, headache, pleuritic chest pain, overwhelming fatigue, myalgia, and malaise • Viral pneumonia rare unless patient immuno-suppressed • History of asthma, COPD, pulmonary disease, alcohol or drug abuse
Physical assessment findings	• Diminished breath sounds • No air moving through lungs in areas (consolidation) • Rales and tubular breath sounds • Percussion over chest illicits dullness over lung tissue

Continued

Differential diagnosis	• COPD • Atelectasis • Lung abscess • Heart failure • Neoplasms • Lung damage from physical agents
Diagnostic tests	• Chest x-ray • Gram stain and culture of expectorant • CBC, complete metabolic panel • Patients older than 40 years and patients who are smokers should have a repeat chest x-ray 4–6 weeks post-treatment to rule out tumor
Medications	• Bacterial pneumonia: amoxicillin with clavulanate; ofloxacin; trimethoprim-sulfamethoxazole; and erythromycin, especially for Legionnaires' disease • Viral pneumonia: monitor for secondary bacterial infection • Mycoplasma pneumonia: erythromycin • Ibuprofen: pain relief
Other therapies	• Increased hydration • Breathing cool steam • Sleeping upright for easier breathing • Bed rest • Cough syrups and avoid cigarette smoke • After acute phase, pneumococcal vaccination and yearly influenza immunization
Follow-up	• If outpatient, have patient return in 48 hours to assess improvement, then every 2 weeks until symptoms are gone and chest x-ray is clear
Red flags	Increased shortness of breath is an emergency. Hospitalization should be strongly considered for patients older than age 65 years if respiratory rate >30 breaths/min, hypotension, or evidence of sepsis is present.

Rheumatoid Arthritis

Important history findings	• When did pain start? Did pain start slowly? Does the patient experience joint stiffness and pain in joints that is worse on awakening in the morning? Is the joint involvement symmetric?
Physical assessment findings	• Symmetric joint pain, redness, warmth, stiffness, decreased range of motion • Flulike symptoms • Muscle pain • Weakness and fatigue • Loss of appetite
Differential diagnosis	• Osteoarthritis
Diagnostic tests	• Lab tests, including rheumatoid factor, C-reactive protein, and erythrocyte sedimentation rate • X-ray • MRI • DEXA scan

Medications	• Disease-modifying antirheumatic agents including:
	  • Plaquenil: antimalarial drug
	  • Cyclosporine: antirejection drug
	  • Methotrexate: chemotherapeutic agent
	• Gold therapy
	• Biological response modifiers: Enbrel, Humira, Kineret, and Remicade
	• Avara: to reduce inflammation
	• Nonsteroidal antiinflammatory drugs
	• Cortisone: systemic and injected

Other therapies	• Zinc, 30 mg daily • Selenium, 300 mg daily • Vitamin C, 1,000 units with meals • Pantothenic acid, 500 mg qid with meals • Vitamin E, 400–800 IU daily
Follow-up	• Follow-up after rheumatology appointment to determine new medications and treatments prescribed • Any time symptoms increase or functional decline

Scabies

Important history findings	• Itching, including when it is present and if it is worse at night • Onset, duration, and distribution of lesions • Treatments tried • History of housemates: Is anyone else displaying symptoms?
Physical assessment findings	• Vesicles: isolated, pinpoint, and filled with serous fluid (may contain mites) • Papules: small and isolated and representative of a hypersensitivity reaction (rarely contain mites) • Urticarial rash in infants and elderly • Common sites of scabies are hands, especially finger webs, wrist, penis, areola, and axillae. Rarely seen on face in adults. • Widespread pruritus and skin excoriation
Differential diagnosis	• Atopic dermatitis • Allergic and irritant contact dermatitis • Papular urticaria • Pediculosis
Diagnostic tests	• Microscopic identification of mites, ova, or feces (skin scraping)
Medications	• Only permethrin, crotamiton, and sulfur ointment considered safe for treating children younger than age 2 years • Lindane sometimes used as a secondary treatment
Other therapies	• Wash all surfaces in living area and sheets, towels, and clothing of everyone in household. • Prophylactic therapy of medication recommended for household members.
Follow-up	• Two weeks to assess treatment response. If no response, refer.

Sinusitis

Important history findings	• History of prior sinus infections, asthma • Pain in periorbital area, on front of face, in tooth, in ears, and in throat • Runny nose, teary eyes • Feeling of fullness in head and ears • Cough that worsens when lying down • Fever, malaise, or colored nasal discharge • Recent upper respiratory infection • Poor response to antihistamines and decongestants
Physical assessment findings	• Periorbital swelling and presence of allergic shiners. Edema in nasal mucosa. Inflammation in throat, tongue, or gums • Lymphadenopathy • Decreased transillumination of sinuses • Positive tenderness on palpation of frontal and maxillary sinuses
Differential diagnosis	• Dental abscess • Cluster headache • Migraine headache • Allergic rhinitis • Nasal polyp • Tumor • Upper respiratory infection
Diagnostic tests	• CBC to determine infection
Medications	• Nasal steroid spray • Antibiotics for infection • Short burst of oral steroids or steroid injection
Other therapies	• Normal saline nasal spray, fluids • Acetaminophen or ibuprofen • Steam inhalation and warm compresses
Follow-up	• 48 hours if there is no improvement
Red flags	Periorbital cellulitis, sinus polyps, and chronic sinusitis should all be referred to either the emergency room or specialist. Exquisite pain with palpation or percussion of the face.

Skin Cancer

Important history findings	**Basal cell:** small fleshy bump often on the back of head, ears, neck, or hands. Accounts for 90% of all skin cancers and is 95% curable. **Squamous cell:** red scaly nodule. Second most common skin cancer. Found on rim of ear, nose, around mouth. **Melanoma:** rarest but most virulent type of skin cancer. Most often found in fair-skinned women. Melanoma has the following features: A: Asymmetrical nodule B: Borders of nodule irregular or ragged C: Color of the nodule varies D: Diameter of the nodule is greater then 10 mm (larger than a pencil eraser) **Important history questions** • Are you out in the sun a lot? • Do you use sunscreen? • Have you had many sunburns? • How long have you had the mole or spot? • Has it changed in shape, size, or color? • Do you have any oozing or bleeding from the mole?
Physical assessment findings	• Moles • Skin lesions • Scaly areas on skin
Differential diagnosis	• Actinic keratosis: sign of prolonged sun exposure • Freckles • Impetigo • Herpes • Molluscum contagiosum • Keratotic lesion
Diagnostic tests	• Punch biopsy of lesion • Refer to dermatologist for other testing
Medications	• Chemotherapy (Efudex and others)
Therapies	• Surgical removal (Mohs' surgery) • Freezing • Laser treatments • Radiation therapy
Follow-up	• Check yearly for return of cancer or new suspicious lesions

Syphilis

Important history findings	• **Primary syphilis:** chancre emerges several weeks after sexual contact; recedes within 3–6 weeks • **Secondary syphilis:** rash on soles of feet and palms of hands, flat warts on moist skin surfaces, regional lymphadenopathy, malaise, fever, anorexia, painful joints • **Latent syphilis—early phase:** no symptoms may last rest of life or may move to late/tertiary phase
Physical assessment findings	• **Primary syphilis:** chancre • **Secondary syphilis:** symmetric maculopapular lesions; lymphadenopathy; fever; 10% with enlarged spleen, hepatitis, nephritic involvement • **Latent tertiary phase:** aortic diastolic murmur, congestive heart failure, aneurysms, irregular pupillary response, unequal reflexes, meningeal irritation, wide-based gait, personality deterioration
Differential diagnosis	• Herpes simplex • Condylomata acuminate • Granuloma inguinale • Lymphogranuloma venereum • Chancroid • Cancer
Diagnostic tests	• **Nontreponemal tests:** reactive venereal disease research laboratory (VDRL) or rapid plasma reagin (RPR) • **Confirmation test:** fluorescent treponemal antibody-absorption test (FTA-ABS)
Medications	• **Primary and secondary syphilis:** benzathine penicillin G 2.4 million units IM × 1 dose; *if allergic to penicillin:* doxycycline 100 mg PO bid × 14 days
Other therapies	• In-depth counseling and support
Follow-up	• Primary and secondary syphilis: testing at 6 and 12 months

Trichomoniasis

Important history findings	• **Women:** yellow–green, malodorous vaginal discharge in large or small amounts; dyspareunia; dysuria, vulvar discomfort, vaginal itching, bleeding after coitus • **Men:** Usually mild or no symptoms
Physical assessment findings	• **Women:** External vulva/perineum: edema, erythema, excoriations, ulcers; erythematous papules and/or petechiae on vaginal walls; cervix appears as "strawberry" from erythematous papules; green–yellow discharge • **Men:** urethral discharge; possibly prostate tenderness
Differential diagnosis	• Bacterial vaginosis • Candidiasis • Gonorrhea • Chlamydia • UTI • Foreign-body vaginitis
Diagnostic tests	• Wet prep shows motile flagellated trichomonads and >10 WBCs • Culture and DNA probe diagnostic • Test for GC, CT, syphilis • 10% KOH whiff test may give amine odor
Medications	• Metronidazole • Tinidazole
Other therapies	• No alcohol for 48 hours after metronidazole and 72 hours after tinidazole; take both drugs with food
Follow-up	• Not indicated unless treatment unsuccessful or infection recurs

Urinary Incontinence

Important history findings	• **Assess:** voiding symptoms, fluid intake, medications, bowel function changes, sexual function changes, pelvic/abdominal surgery, pads/day, diabetes mellitus, function, functional changes, psychological/mental status. Both genders experience types of UI. • **Stress UI:** c/o urine leakage with coughing, sneezing, lifting, bending, exercising • **Urge UI-OAB-dry:** c/o desire to urinate is sudden, forceful, undeniable • **Urge OAB-UI-wet:** involuntary loss of urine right after urgency sensation (results from hyperactive detrusor muscle) • **Overflow UI:** c/o feeling as if need to void even if just voided; feels fullness, increased abdominal girth, discomfort in suprapubic area; may have constant small urine leakage • **Mixed UI:** c/o stress and urge UI • **Total incontinence:** no control of urine; constant loss of urine because of sphincter damage
Physical assessment findings	• **Both genders:** perform focused neurologic and focused abdominal examination for lower abdominal pain, organomegaly, increased girth, masses, bladder distention, and suprapubic tenderness • **Females:** pelvic examinations, checking for cystocele, bladder neck motion, leakage with Valsalva— for this assessment, bladder should be filled before exam, strength of vaginal contraction • **Men:** rectal examination of prostate, rectal sphincter tone for pelvic floor muscle endurance
Differential diagnosis	• Pressure from pelvic/abdominal masses • Renal calculi • Pelvic/vaginal infection • Genital herpes

Continued

Diagnostic tests	• Urinalysis • Urine C&S • Pregnancy test for women, plus indicated tests for STI and vaginitis • Blood chemistry lab scan • Three-day voiding diary brought for visit
Medications	• **Stress UI:** alpha-adrenergics; estrogen preparations may help women; nonpharmacologic therapy most helpful for SUI • **Urge UI (overactive bladder):** anticholinergic, antimuscarinic, antispasmodic single or combined agents
Other therapies	• **Stress UI:** surgical pubovaginal sling or transvaginal suspension; intraurethral collagen injection • **Urge UI (overactive bladder):** timed voiding for behavioral modification to improve voluntary bladder control; pelvic floor muscle training to improve symptoms (Kegel's); biofeedback with or without sacral nerve electrical stimulation (used with medications) • **Overflow UI:** intermittent self-catheterization, nerve stimulation, surgical correction of obstruction • Assist patients with options for leakage, bedding, furniture, clothing, auto upholstery protection, managing odor, hygiene; psychological support. Refer to physical therapist for perineal muscle control; may be helpful for women with no to little pelvic floor muscle contraction.
Follow-up	• As needed

Urinary Tract Infection (Lower Tract)

Important history findings	• **Acute:** sudden onset when no prior symptoms • **Chronic:** unresolved infection after treatment • **Recurrent:** recurs <2 weeks after first infection • **Complicated:** acute or chronic with history of catheter use, pregnancy, chronic illness • **Presenting signs/symptoms:** dysuria, frequency, urgency, hematuria, flank pain, suprapubic pain, incontinence, urine smells foul

Continued

Physical Assessment	• Urinalysis reveals hematuria, nitrites, >10 leukocytes, elevated protein in urine
Differential diagnosis	• Pyelonephritis • Vaginitis • STIs • Tumors • Interstitial cystitis (inflammatory condition without infection)
Diagnostic tests	• Clean-catch midstream urine for urinalysis • Culture and sensitivity for causative organism
Medications	Always check for history of drug allergies; review contraindications. • With acute uncomplicated UTI, no sulfa allergy, no prior hospitalization, and no antibiotic treatment in last 3 months: nitrofurantoin (100 mg bid × 5 days); trimethoprim-sulfamethoxazole or fluoroquinolone • With complicated UTI: trimethoprim-sulfamethoxazole (Bactrim DS 1 tab po q12 h × 10–14 days) or a fluoroquinolone (levofloxacin, gatifloxacin, ofloxacin, norfloxacine) • For pain, burning, urgency: phenazopyridine (Pyridium), 200 mg po tid after meals. This drug changes urine to orange color; warn patient.
Other therapies	• Completion of all medication • Eight 8-oz glasses of water per day • Vitamin C daily • Regular and complete emptying of bladder • Showers instead of baths • For women: wipe front to back after toileting, practice good hygiene, wear cotton underwear only (no thongs), avoid feminine hygiene products and harsh soaps, empty bladder before and after coitus, and use condoms with coitus
Follow-up	• Not indicated with uncomplicated UTI.

Urinary Tract Infection (Upper Tract)

Important history findings	• Sudden onset of fever lasting hours to a few days • Chills • Back pain on one or both sides in flank area • Nausea and vomiting
Physical assessment findings	• Elevated blood pressure pulse rate • Fever up to 103°F • Shaking chills • Unilateral costovertebral angle tenderness • Nausea and vomiting • Diarrhea • Extreme fatigue • May have urinary urgency, frequency, suprapubic discomfort, sepsis • Evidence of mental confusion in elderly patients
Differential diagnosis	• Cystitis • Urethritis • Asymptomatic bacteruria • Interstitial cystitis, PID, or other pelvic infectious/inflammatory condition in women • Renal calculi
Diagnostic tests	• Urinalysis indicates bacteria, WBC casts (diagnostic), proteinuria, leukocytes, nitrites, pyuria; hematuria IVP, DMSA scan • U/S often used for chronic pyelonephritis
Medications	• Oral therapy used only in mild acute cases without sepsis or nausea/vomiting: trimethoprim-sulfamethoxazole or a fluoroquinolone • Amoxicillin or amoxicillin-clavulanate may be effective with first episodes in young women without anatomic abnormalities. • Third-generation cephalosporins, aminoglycosides, or aztreonam for antibiotic-resistant bacteria
Other therapies	• Hospitalization may be indicated.
Follow-up	• Expect adequate response within 48 hours or reevaluate. Refer to specialist to prevent kidney damage with any lack of response.

Managed Care

Type of Health Insurance	Copayment or Deductible	Payment	Authorization Requirements
Health maintenance organization	Copay is fixed.	Providers receive per patient per month payment. No payment for individual visit.	Authorizations required for procedures. Referrals required for visits to specialists.
Preferred provider organization	There is a fixed copay and a deductible that must be met each year.	This type of plan pays fee for service at specific rates. Cost is lower to patients if they choose a provider who is in the organization.	Authorizations required for procedures.
Independent practice association	Copay is required.	Fees are set for most services inside the association.	Authorizations required for procedures.
Exclusive provider organization	Copay is required.	Fees are set and provider gets paid a per patient per month fee.	Authorizations required for procedures.
Point of service plan	Copay is required, and there is a deductible. Fees are lower if patient chooses provider in network.	Providers in network receive payment per patient per month.	Authorizations required for procedures.

Medicare

Medicare is health insurance for people age 65 or older, younger than age 65 with certain disabilities, and any age with permanent kidney failure.

- Participating providers can only charge what Medicare allows.
- Medicare deductibles and copays cannot be waived.
- Medicare pays NPs at 85% of the physician's fee schedule or at 80% of the actual charge, whichever is lower.
- NP must submit own billing number.
- A UPIN billing number must be obtained and submitted on all claims.

Medicare Part A Covered Services

- Inpatient care in a hospital, skilled nursing facility, or hospice
- Home health care, dependent on certain conditions

Medicare Part B Covered Services

- Provider fees: office and hospital visits, consultations, nursing home visits
- X-ray, lab tests, physical and occupational therapy, other outpatient diagnostic testing
- Ambulatory surgical center services
- Surgical dressing, casts, splints
- Certain braces
- Durable medical equipment

Medicaid

Medicaid is a state program that differs in eligibility and payment depending on the state in which you practice. Services covered include:

- Inpatient and outpatient services
- Physician visits
- Dental visits
- Nursing home services for those older than age 21
- Home health

- Family planning and supplies
- Rural health clinics
- Lab tests and x-rays
- Services of an NP or nurse midwife

Tricare

Tricare is a health care program serving active duty service members; National Guard and Reserve members; retirees; and their families, survivors, and certain former spouses worldwide. CHAMPUS, the Civilian Health And Medical Program for the Uniformed Services, is a cost-sharing program that is used to provide inpatient and outpatient care for dependents from civilian sources; it is for military retirees and families.
TRICARE has three plans with different benefits:

- TRICARE Prime:
  - Fewer out-of-pocket costs than other TRICARE options
  - Enhanced vision and preventive coverage
  - Priority access for care at military treatment facilities
  - Receive most care from an assigned primary care manager (PCM)
  - PCM refers you to specialists when necessary
  - No claims to file (in most cases)
  - Easy to transfer enrollment when moving
  - Time and distance access standards for care, including wait times for urgent, routine, and specialty care
- TRICARE Standard:
  - Freedom to choose any TRICARE-authorized provider
  - Referrals not required, but some care may require prior authorization
  - Highest out-of-pocket costs
  - May have to submit health care claims
- TRICARE Extra:
  - Must visit a TRICARE network provider
  - Fewer out-of-pocket costs
  - Network providers file claims for patient
  - Receive care in a military treatment facility on a space-available basis only

CPT Codes

CPT codes are used to bill for evaluation and management services. Each category contains two to seven levels for billing. Each level requires a specific amount of documentation to be billable.

CPT Codes	Description
99201–99205	New patient office visit codes
99211–99215	Established patient office visit codes
99221–99223	Initial hospital services
99231–99233	Subsequent hospital services
99241–99245	Consultation outpatient
99251–99255	Consultation inpatient
99234–99236	Hospital observation or inpatient care services
99217–99285	Emergency room services
99304–99310	Initial nursing facility service
99318	Annual nursing facility assessment
99307–99310	Subsequent nursing facility services
99293–99294	Initial inpatient pediatric critical care
99295–99296	Inpatient neonatal critical care
99298–99300	Continuing intensive care services
99341–99345	Home services, new patient
99347–99350	Home services, established patient
99324–99328	Domiciliary care, new patient
99334–99337	Domiciliary care, established patient
99381–99387	Preventive med codes, new patient
99391–99397	Preventive med codes, established patient
99354–99355	Prolonged care, outpatient
99356–99357	Prolonged care, inpatient
99358–99359	Prolonged care, without direct patient contact

International Classification of Diseases, 9th edition, Clinical Modifications

- Classification takes patient's condition, illness, or injury and translates it into numeric and alphanumeric format for billing and reimbursement purposes.
- Diagnosis codes indicate medical necessity and therefore drive reimbursement.
- V codes (V01-V83) are used for preventive services that are covered, such as "woman's health yearly exam."
- E codes establish medical necessity and identify causes of injury and other problems. E codes are never the primary code; they can speed up reimbursement. Child abuse takes precedence over all other E codes; next comes cataclysmic events, and third is transportation accidents. Examples of E codes follow:
  - E884.0: Fall from playground equipment
  - E917.0: Struck accidentally by an object or person in a sports event
  - E901.0: Excessive cold

Guidelines for Coding and Reporting

- Identify each service or procedure, or supply with a diagnosis code.
- Chronic diseases should be reported if appropriate.
- Always use the code with the highest degree of specificity.
- Properly link all diagnosis codes to the CPT code.
- Do not use "rule out," "suspected," "probable," or "questionable."
- Use signs and symptoms when a definitive diagnosis code is not available.
- Code the primary diagnosis first.
- Do not use diagnosis codes that are no longer available.

Commonly Used Codes

Code	Description
338.1	Acute pain
781.2	Abnormal gait
783.2	Abnormal loss of weight or underweight
413	Angina
493.0	Asthma
724.5	Back pain
616.10	Bacterial vaginosis
466.0	Bronchitis
528.3	Cellulitis and abscess
099.53	Chlamydia
496	Chronic obstructive pulmonary disease (COPD)
338.2	Chronic pain
692.9	Contact dermatitis
296.2	Depression
250.0	Diabetes
562.10	Diverticular disease
629.9	Eczema
098.0	Gonorrhea
784	Headache
346.2	Headache—cluster
346	Headache—migraine
307.81	Headache—tension
054.10	Herpes simplex
053.9	Herpes zoster
401.1	Hypertension
244.9	Hypothyroidism
280.9	Iron-deficiency anemia
564.1	Irritable bowel syndrome
733.0	Osteoporosis
382.0	Otitis media

Continued

Code	Description
278.02	Overweight
532.9	Peptic ulcer
486	Pneumonia
784.91	Postnasal drip
133.0	Scabies
473.9	Sinusitis
649.5	Spotting complicating pregnancy
110.5/110.4	Tinea corporis/pedis
305.1	Tobacco use disorder
131.9	Trichomoniasis
599	Urinary tract infection
078.19	Venereal warts (human papillomavirus)

Medicare Documentation

Key components to visit:

- History, including chief complaint; history of present illness; review of systems; and past medical, surgical, family, and social histories
- Examamination
- Decision making
- Counseling
- Coordination of care
- Nature of presenting problem and time

Level of Visit

Documentation of the level of the patient's visit is important because the higher the level of visit the more reimbursement. However, if you do not meet the criteria for the higher level of visit, you can be charged with Medicare fraud. Levels of visits include:

- **Problem-focused:** A limited examination of the affected body area or organ system
- **Expanded-problem focused:** A limited examination of the affected body area or organ system and other symptomatic or related organ systems
- **Detailed:** An extended examination of the affected body areas and other symptomatic or related organ systems
- **Comprehensive:** A general multisystem examination or a complete examination of an organ system

Decision Matrix for New Office Patients

Code	History	Exam	Decision-Making	Nature of Presenting Problem	Time in Minutes
99201	Problem focused	Problem focused	Straightforward	Self-limiting or minor	10
99202	Expanded problem focused	Expanded problem focused	Straightforward	Low to moderate	20
99203	Detailed	Detailed	Low	Moderate	30
99204	Comprehensive	Comprehensive	Moderate	Moderate	45
99205	Comprehensive	Comprehensive	High	High	60

Decision Matrix for Established Office Patients

Code	History	Exam	Decision-Making	Nature of Presenting Problem	Time in Minutes
99211	Does not require an NP or physician	Nurse visit	BP check, blood sugar check	Minimal	5
99212	Problem focused	Problem focused	Straightforward	Self-limited or minor	10
99213	Expanded problem focused	Expanded problem focused	Low	Low to moderate	15
99214	Detailed	Detailed	Moderate	Moderate to high	25
99215	Comprehensive	Comprehensive	Moderate to high	Moderate to high	40

Pregnancy Category

This is a system of classifying drugs according to their established risks for use during pregnancy.

- **Category A:** Controlled human studies have demonstrated no fetal risk.
- **Category B:** Animal studies indicate no fetal risk, but no human studies conducted; or adverse effects in animals but not in well-controlled human studies.
- **Category C:** No adequate human or animal studies; or no adverse fetal effects in animal studies but no available human data.
- **Category D:** Evidence of fetal risk, but benefits outweigh risks.
- **Category X:** Evidence of fetal risk. Risks outweigh benefits.

Antibiotics

Used for treatment or prevention of bacterial infection. Which type of antibiotic to use depends on the type of bacteria present.

Aminoglycosides

- **Examples:** Gentamicin, tobramycin, streptomycin.
  Pregnancy Category D: Should not be used in nursing mothers.
- **Indications:** Bactericidal protein synthesis inhibitors binding to bacterial ribosomes to prevent the initiation of protein synthesis. Effective against *Enterobactor, Klebsiella, Salmonella, Shigella, Proteus, Staphylococcus aureus* and *Pseudomonas aeruginosa.*
- **Administration:** IV, cream, eye drops, ointment, by mouth.
- **Adverse reactions and side effects:** Aminoglycoside usage has been limited because prolonged use has been found to cause kidney damage and injury to the auditory nerves, leading to deafness. If used on skin stinging may occur; with eye drops, conjunctivitis may occur. Hearing loss, dizziness, and roaring in the ears may occur at high doses; antibiotic-induced colitis, voice alteration, and cough may occur.
- **Contraindications:** Use with caution in patients who are pregnant, have renal impairment, are infants or elderly, or have muscle weakness. Absolutely contraindicated in patients with myasthenia gravis.

Cephalosporin

- **Examples:** 1st-generation cephalexin, cefadroxil, cephradine; 2nd-generation cefuroxime, cefaclor; 3rd-generation cefotaxime, ceftaxidime, cefixime—these give the best CNS penetration.
  Pregnancy Category B: May be used with nursing mothers.
- **Indications:** Beta lactam antibiotics: Used for billiary tract infection; throat infections; community-acquired pneumonia; and exacerbation of bronchitis, meningitis, pylonephritis, and gonorrhea.
- **Administration:** IV, by mouth.
- **Adverse reactions and side effects:** Hypersensitivity reactions, diarrhea, colitis, reduction in effectiveness of oral contraceptives, antacids can reduce absorption, diuretics increase plasma concentration of cephalosporin drugs, cephalosporin drugs increase warfarin levels.
- **Contraindications:** Known hypersensitivity to penicillin or cephalosporin, caution with patients with renal impairment because these drugs are excreted through the kidneys.

Fluoroquinolone

- **Examples:** Ciprofloxacin, ofloxacin, levofloxacin, gemifloxacin.
  Pregnancy Category C: Not recommended for nursing mothers.
- **Indications:** Synthetic antibiotics: Urinary tract and gynecologic infections, gonorrhea, prostatitis, respiratory tract infections, skin and skin structure infections, bone and joint infections, infectious diarrhea, intraabdominal infections, febrile neutropenia, postexposure treatment of inhalational anthrax.
- **Administration:** Eye drops, ear drops, IV, by mouth.
- **Adverse reactions and side effects:** Seizures, dizziness, drowsiness, headache, acute psychoses, lightheadedness, tremors, pseudomembranous colitis, abdominal pain, diarrhea, nausea, photosensitivity, hyperglycemia, hypoglycemia, tendinitis, tendon rupture, anaphylaxis, Stevens-Johnson syndrome. Increased blood levels of theophylline, cyclosporine, caffeine, and warfarin. Calcium-containing substances such as dairy products and antacids may interfere with the absorption of fluoroquinolones. Cimetidine may interfere with elimination of fluoroquinolones.

- **Contraindications:** These drugs stop epiphyseal growth and should never be given to children younger than 18 years of age. Hypersensitivity reactions.

Macrolides

- **Examples:** Azithromycin (Zithromax®), erythromycin, clarithromycin (Biaxin®).
  Pregnancy Category B for azithromycin and erythromycin. Pregnancy Category C for clarithromycin. Not recommended for nursing mothers.
- **Indications:** They are effective against gram-positive bacteria and most gram-negative bacteria, *Neissera, Legionella,* and *Haemophilus,* but not *Enterobacteriaceae.* Used for upper respiratory tract infections, bronchitis, pneumonia, skin and skin structure infections, nongonococcal urethritis, cervicitis, gonorrhea, and chancroid. *Mycobacterium avium* complex infections in patients with HIV and bacterial endocarditis prevention.
- **Administration:** By mouth, IV, cream.
- **Adverse reactions and side effects:** Severe allergic reactions, cardiac arrhythmias, prolonged INR with warfarin use, gastrointestinal disturbances (nausea, vomiting, diarrhea, dyspepsia, abdominal pain and cramps, headache, taste disturbance, eosinophilia, reversible hearing loss, and hepatotoxicity are infrequent occurrences with all the macrolides). Increased and toxic effects when combined with carbamazepine, cisapride, digoxin, ergot alkaloids, methylprednisolone, terfenadine, triazolam, and warfarin.
- **Contraindications:** Known sensitivity to macrolide antibiotics.

Penicillin

- **Examples:** Penicillin G, Pen VK, amoxicillin, Trimox.
  Pregnancy Category B: May be used with nursing mothers.
- **Indications:** Beta lactam antibiotics used in the treatment of bacterial infections caused by susceptible, usually gram-positive, organisms. Used for skin and skin structure infections, otitis media, sinusitis, upper respiratory infection, genitourinary infection, septicemia, endocarditis prophylaxis, ulcer disease from *Helicobacter pylori.* May be used for Lyme disease off label.

- **Administration:** By mouth.
- **Adverse reactions and side effects:** Diarrhea, hypersensitivity, nausea, rash, neurotoxicity urticaria, superinfection (including candidiasis), fever, vomiting, erythema, dermatitis, angioedema, seizures (especially in patients with epilepsy), or pseudomembranous colitis. Decreased effectiveness of oral contraceptives.
- **Contraindications:** Known sensitivity to penicillin.

Sulfa Antibacterial Drugs

- **Examples:** Sulfamethoxazole, Bactrim®, Bactrim DS®, Septra®, Septra DS®, sulfamethoxypyridazine.
  Pregnancy Category C: Do not use with nursing mothers.
- **Indications:** Ear infections, urinary tract infections, bronchitis, traveler's diarrhea, and *Pneumocystis carinii* pneumonia infections. Bactrim DS effective for MRSA.
- **Administration**: By mouth.
- **Adverse reactions and side effects:** Fever, headache, rash no matter how mild, cough, shortness of breath, diarrhea, restlessness, confusion, hallucinations, seizures, slow heart rate, severe tingling, numbness, muscle pain, nausea, stomach pain, loss of appetite, itchy skin, dark-colored urine, clay-colored stool, jaundice, decreased urination. May increase or have toxic effect when combined with methotrexate, phenytoin, sulfonylureas, warfarin.
- **Contraindications:** Known sensitivity to sulfa medications.

Tetracycline/Doxycycline

- **Examples**: Tetracycline Sumycin, Terramycin, Tetracyn, and Panmycin. Doxycycline is a synthetic form of tetracycline; forms include Vibra tabs, Doryx, Monodox, Oracea, Vibramycin.
  Pregnancy Category D: Not recommended for pregnant women or nursing mothers.
- **Indications:** Broad-spectrum bacteriostatic agents most often used with severe acne. Doxycycline is used with sinusitis, prostatitis, syphilis, chlamydia, and pelvic inflammatory disease. Effective for *Shigella*, Lyme disease, *Acinetobacter*, MRSA.
- **Administration:** By mouth; for doxycycline normal dose is 100 mg BID.

- **Adverse reactions and side effects:** Can stain teeth, skin photosensitivity, drug-induced lupus or hepatitis. Dizziness. Do not use in children. Take on empty stomach; do not take with milk or other calcium-rich foods.
- **Contraindications:** Do not use with methotrexate. Do not use in children younger than 8 years old and avoid during periods of tooth development.

Antihypertensives

Angiotensin-Converting Enzyme Inhibitors

- **Examples:** (Most end in "ril") Captopril (Capoten®, Capozide®), lisinopril (Prinivil®, Zestril®), enalopril (Vasotec®), fosinopril (Monopril®), benazepril (Lotensin®), ramipril (Altace®); also combined with an HCTZ (lisinopril/HCTZ).
  Pregnancy Category D: Should not be used in nursing mothers, should not be used in children younger than 6 years old.
- **Indications:** Hypertension, heart failure, left ventricular dysfunction, renal protection for diabetics.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Hyperkalemia especially when used with potassium-sparing diuretics or potassium supplements. Cough main reason for discontinuation. Dizziness, renal impairment, nausea, angioedema. May increase lithium, phenothiazine, and digoxin levels. NSAIDs may decrease effect of ACE.
- **Contraindications:** Previous angioedema, renal artery stenosis, hypovolemia, or dehydration; not to be used in pregnancy.

Angiotension Receptor Blockers

- **Examples:** (Most end in "artan") Irbesartan (Avapro®, Avalide®), valsartan (Diovan®), losartan (Cozaar®, Hyzaar®), candesartan (Atacand®), olmesartan (Benicar®).
  Pregnancy Category D: Should not be used in nursing mothers, should not be used in children younger than 6 years old.
- **Indications:** Hypertension, heart failure, left ventricular dysfunction, renal protection for patients with diabetes.

- **Administration:** By mouth.
- **Adverse reactions and side effects:** Dizziness, headache, and/or hyperkalemia. First dose may cause orthostatic hypotension, rash, diarrhea, dyspepsia, abnormal liver function, muscle cramp, myalgia, back pain, insomnia, decreased hemoglobin levels, renal impairment, pharyngitis, and/or nasal congestion.
- **Contraindications:** Known sensitivity to agiotension receptor blockers.

Beta Adrenergic Blocking Agents

- **Examples:** (Most end in "ol") Atenolol (Tenormin®), metoprolol (Toprol XL®, Lopressor®), nadolol (Corgard®), propranolol (Inderal®).
  Pregnancy Category C: Not to be used in nursing mothers.
- **Indications:** Reduce morbidity and mortality. Decrease heart rate myocardial contractility, and conduction velocity of the heart; reduced cardiac output. After myocardial infarction, heart failure.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Additive effect when given with negative inotropes or other antihypertensive agents. Therapy should not be abruptly stopped. Efficacy has not been established in children. Adverse effects include bradycardia, hypotension, worsening CHF, PVD, bronchospasm, impotence, masking the signs of hypoglycemia, dizziness, fatigue, and sleep disturbance.
- **Contraindications:** Severe bradycardia, heart block, cardiogenic shock, Class IV heart failure, sick sinus syndrome.

Calcium Channel Blockers

- **Examples:** Dihydropyridine calcium channel blockers ending in "ipine" such as amlodipine (Azor®, Caduet®, Exforge®, Lotrel®, Norvasc®), felodipine (Plendil®), nifedipine (Procardia®, Adalat®). Phenylalkylamine calcium channel blockers include verapamil. Benzothiazepine calcium channel blockers include diltiazem (Cardizem®, Tiazac®).
  Pregnancy Category C: Not recommended for nursing mothers.
- **Indications:** Hypertension, supraventricular arrhythmias, atrial fibrillation, angina, hypertrophic cardiomyopathy.
- **Administration:** By mouth, IV.

- **Adverse reactions and side effects:** Myocardial depression when used with beta blockers. Safety and efficacy have not been established in children. Hypotension, peripheral edema, tachycardia, flushing, headache, GI upset. Contraindicated with second- or third-degree heart block.
- **Contraindications:** Advanced aortic stenosis, severe left ventricular dysfunction, hypotension, cardiogenic shock, sick sinus syndrome, heart block, atrial flutter or fibrillation, or an accessory bypass tract.

Alpha Blockers

- **Examples:** (most end in "osin") Doxazosin (Cardura®), terazosin (Hytrin®). Pregnancy Category C: Not for use with nursing mothers.
- **Indications:** Reduces alpha adrenergic stimulus thereby relaxing smooth muscle in blood vessels. Also improves glucose tolerance, increases insulin sensitivity. Not recommended as first-line monotherapy.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** First-dose effect of orthostatic hypotension. Administer first dose at night. Safety and efficacy in children not known. Headache, peripheral edema, impotence, hypotension, somnolence, rare priapism. Caution when given with clarithromycin, ketoconazole, itraconazole.
- **Contraindications:** None.

Centrally and Peripherally Acting Antiadrenergic Agents

- **Examples:** Centrally acting includes Catapres, Aldomet, and clonidine. Peripherally acting includes reserpine and guanadrel. Pregnancy Category C: Not recommended for use with nursing mothers.
- **Indications:** Centrally acting agents decrease dopamine and norepinephrine production in the brain and peripherally acting agents decrease the release of epinephrine, both resulting in a decrease in sympathetic nervous activity throughout the body. Blood pressure declines with the decrease in peripheral resistance. Used for severe hypertension not controlled by other medications.
- **Administration:** By mouth and IV.
- **Adverse reactions and side effects:** Action potentiated by beta blockers and vasodilators. Effect inhibited by phenothiazines, sympathomimetics,

and tricyclic antidepressants. Side effects include orthostatic hypotension, fluid retention, asthma, GI upset, depression, fatigue, headache, increased sensitivity to alcohol, fever, joint pain, dry eyes and mouth, decreased libido, impotence. Patients should be instructed not to discontinue therapy without consulting their health-care provider. Sudden cessation of these medications can cause nervousness and sudden increase in blood pressure.

- **Contraindications:** Should not be used with known sensitivity.

Antianxiety and Antidepressant Medications

All patients taking any type of antidepressant medication should be closely monitored for suicide ideation. The recommended regimen is to see the patient 1 week, 2 weeks, and 1 month after starting medication to determine suicide risk. Risk may be elevated when starting antidepressant medication because of the medication itself or because patients have more energy after starting the medication and are able to act on a suicide desire. It is imperative to document that suicide risk (desire, means, and plan) has been assessed at every visit and that, if there are any positive risks, then appropriate immediate referral has been accomplished.

Benzodiazepines

- **Examples:** Alprazolam (Xanax®), lorazepam (Ativan®), chlordiazepoxide HCL (Librium®), clonazepam (Klonopin®), diazepam (Valium®). Scheduled narcotic drug.
  Pregnancy Category D: Not recommended for nursing mothers.
- **Indications:** Anxiety, panic disorder.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Dizziness, drowsiness, lethargy, confusion, hangover, headache, depression, paradoxical excitation, blurred vision, diarrhea, nausea, physical dependence, psychological dependence, tolerance. Do not use with alcohol, opioid analgesics, kava, valerian, skullcap, chamomile, or hops because these can increase CNS depression.
- **Contraindications:** Hypersensitivity, narrow-angle glaucoma, preexisting CNS depression, uncontrolled pain.

Tricyclic Antidepressants

- **Examples:** Amitriptyline, clomipramine (Anafranil®), doxepin (Sinequan®), nortriptyline (Pamelor®), trazodone.
  Pregnancy Category C: Not recommended in nursing mothers.
- **Indications:** Depression; unlabeled uses—insomnia and chronic pain syndromes.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Not recommended in children younger than age 10 years. Side effects: Causes increased ocular pressure with glaucoma, causes urinary retention, and increases seizure risk; mania/hypomania may occur. Avoid abrupt cessation. Monitor use with cimetadine, barbiturates, phenytoin, phenothiazines, SSRIs.
- **Contraindications:** Contraindicated with urinary retention, glaucoma, or post-MI. Avoid in cardiovascular disease, psychosis, diabetes. Avoid abrupt cessation. Contraindications in acute MI, or within 14 days of MAO inhibitors.

Serotonin Reuptake Inhibitor

- **Examples:** Escitalopram (Lexapro®), citalopram (Celexa®), paroxetine (Paxil®), fluoxetine (Prozac®), sertraline (Zoloft®).
  Pregnancy Category D: Not recommended for nursing mothers.
- **Indications:** Depression, general anxiety disorder, panic disorder, social anxiety disorder, obsessive compulsive disorder, posttraumatic stress syndrome.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Do not give with citalopram. Do not stop abruptly. Precautions: history of seizures, hepatic or renal impairment, altered metabolic or hemodynamic states. Side effects include nausea, insomnia, ejaculation disorders, and fatigue. Precautions: history of seizures, mania, cardiac disease, narrow-angle glaucoma, suicidal tendencies. Caution with warfarin, NSAIDs, cimetidine, phenytoin, digoxin, phenobarbital, and St. John's wort. Do not stop abruptly. Side effects include sweating, decreased appetite, GI upset, headache, decreased libido.
- **Contraindications:** Renal or hepatic dysfunction. Avoid abrupt cessation. Not with or within 14 days of stopping MAO inhibitors.

Serotonin and Norepinephrine Reuptake Inhibitor

- **Examples:** Duloxetine (Cymbalta®), venlafaxine (Effexor XR®). Pregnancy Category C: Not recommended for nursing mothers.
- **Indications:** Depression, generalized anxiety disorder, social anxiety disorder, panic disorder.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Side effects include nausea, dry mouth, constipation, dizziness, fatigue, somnolence, sweating, mania, tremor, blurred vision, hot flashes, urinary retention. Avoid abrupt cessation of medications because this may cause flulike symptoms, somnolence, insomnia, headache, nervousness, asthenia, sweating, dry mouth, vasodilatation, abnormal dreams, tremor, hypertension, sexual dysfunction. Avoid alcohol, tryptophan supplements, SSRI and SNRIs triptans.
- **Contraindications:** Allow at least 14 days after MAOI discontinuance before starting these drugs. Contraindicated in narrow-angle glaucoma and with MAOIs. Precautions in severe renal impairment, hepatic insufficiency, chronic liver disease, alcohol abuse.

Other Types of Antidepressants

Bupropion (Wellbutrin®, Zyban®): Indicated for depression. Pregnancy Category C not recommended for nursing mothers. Indicated for depression and may be used in addition to an SSRI. Also used for smoking cessation. Common side effects of Wellbutrin XL may include weight loss, nausea, vomiting, insomnia, or even sore throat. Contraindicated for those individuals with a prior history of seizure disorders, alcohol abuse, eating disorders.

Olanzapine + Fluoxetine (Symbyax®): Depressive episodes associated with bipolar disorder. Pregnancy Category C: Not recommended for nursing mothers. A gradual reduction in the dose rather than abrupt cessation is recommended whenever possible. If intolerable symptoms occur following a decrease in the dose or on discontinuation of treatment, asthenia, edema, increased appetite, peripheral edema, pharyngitis, somnolence, abnormal thinking, tremor, and weight gain may occur. May potentiate antihypertensive medications and cause hypotension. Contraindicated with MAOIs, antiseizure medications, pimozide, and thioridazine.

Phenyltriazine (Lamictal®): Maintenance treatment of bipolar disorder. Pregnancy Category C: Not recommended for nursing mothers. Side effects. Rash leading to Steven-Johnson syndrome and toxic epidermal necrolysis have occurred; other side effects include vomiting, nausea, ataxia, dizziness, headache, somnolence, blurred vision, and diplopia. Some estrogen-containing oral contraceptives have been shown to decrease serum concentrations of lamotrigine. Contraindicated in patients who have demonstrated hypersensitivity to the drug or its ingredients.

MAOIs (Ensam®, Marplan®, Parnate®): Depression that does not respond to other medications. Pregnancy Category D: Not recommended in pregnancy and for nursing mothers. Strict dietary regimen required. Patient should avoid liver, hard sausage, pickled herring, fava beans, sauerkraut, cheese, yogurt, any alcoholic beverage, yeast, chocolate, and caffeine. Common side effects include dry mouth, lightheadedness, dizziness, low blood pressure, headache (mild), sleepiness, tiredness, weakness, trouble sleeping, muscle twitching during sleep, shakiness, trembling, restlessness, blurred vision, weight gain, reduced tolerance for alcohol, decreased amount of urine, decreased sexual ability, increased appetite (especially for sweets), and weight gain. Less common side effects include high blood pressure (which may occur if you eat restricted foods or take certain medications).

Stop using the MAOI and get emergency help if you experience signs of dangerously high blood pressure including: severe chest pain, fast or slow heartbeat, severe headaches, severe dizziness or lightheadedness, increased sweating (possibly with fever or cold, clammy skin), nausea or vomiting, stiff or sore neck, swelling of feet or lower legs, increased sensitivity to light, and enlarged pupils. Rare side effects include dark urine, fever, skin rash, slurred speech, sore throat, staggering walk, yellow eyes or skin. Contraindications: Anesthesia, wellbutrin, tryptophan. Should not be used in patients with heart, renal, or hepatic failure.

Azapirone/Buspirone (Buspar®): Anxiety and depression. Pregnancy Category B: Not recommended for nursing mothers. Common side effects are mild but include drowsiness, nausea, headaches, anxiety, lightheadedness, confusion, anger, diarrhea, muscle aches or pains, and weakness. Contraindicated with MAOIs. Caution should be used in patients with renal or hepatic impairment.

Medications for Diabetes

Sulfonylurea

- **Examples:** Glimepiride (Amaryl®), glipizide (Glucotrol®, Glucotrol XL®), Glynase, glyburide (DiaBeta®, Micronaise®), chlorpropamide (Diabinese®). Pregnancy Category C except for Glynase and Micronase, which are category B. Not recommended for nursing mothers because it may cause hypoglycemia in baby.
- **Indications:** Hyperglycemia. Most patients become resistant to these drugs over time and may require either dose adjustments or a switch to insulin.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Precautions: Impaired renal or hepatic function, adrenal or pituitary insufficiency, stress. Side effects include increased risk of cardiovascular mortality, hypoglycemia, dizziness, headache, nausea, skin allergic reactions.
- **Contraindications:** Known hypersensitivity to sulfonylureas, ketoacidosis, or allergy to sulfa.

Biguanide

- **Examples:** Metformin (Fortamet®, Glucophage®, Glumetza®, Riomet®). Pregnancy Category B: Safe for use in nursing mothers.
- **Indications:** Decreases the amount of glucose produced by the liver. Lowers blood glucose levels by making muscle tissue more sensitive to insulin so glucose can be absorbed. Used for hyperglycemia. Also used for polycystic ovarian syndrome.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Lactic acidosis most important side effect. Discontinue biguanide before using intravenous dyes. Diarrhea, dyspepsia, can cause hypoglycemia when prescribed with other drugs.
- **Contraindications:** Risk for lactic acidosis, renal disease (elevated creatinine levels).

Thiazolidinediones

- **Examples:** Rosiglitazone (Avandia®), pioglitazone (Actos®). Pregnancy Category C: Not recommended for nursing mothers. These drugs may cause ovulation in premenopausal women, and use of birth control methods should be advised to avoid pregnancy.
- **Indications:** Lowers blood glucose levels by making muscle tissue more sensitive to insulin so glucose can be absorbed. Used for hyperglycemia. Type 2 diabetes, used off label for polycystic ovarian syndrome.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Water retention and edema, headache, sinusitis, pharyngitis, myalgia, anemia, weight gain, hypoglycemia. Precautions: Hepatic disease, ALT level 2.5 × normal.
- **Contraindications:** Class III or IV heart failure.

Insulin

- **Examples:** Regular insulin (short acting), NPH insulin and Nevemir (long acting), Novolog 70/30 (70% NPH, 30% regular insulin), Humalog 72/25 (75% NPH, 25% regular insulin), Humalog 70/30 (70% NPH, 30% regular insulin), Humalog 50/50 (50% NHP, 50% regular insulin), Lantus Insulin (once-a-day dosed insulin; do not mix with other insulins), Exubera (inhaled insulin).
- **Indications:** Hypoglycemia, Type 1 diabetes.
- **Administration:** Subcutaneous injection except for Exubera, which is inhaled.
- **Adverse reactions and side effects:** Hypoglycemic, redness at injection site, weight gain, in rare cases tingling and swelling.
- **Contraindications:** Known sensitivity to insulin.

Combination Drugs

- **Examples:** Metformin plus thiazolidinedione (Actoplus MET™, Avandamet®), thiazolidinedione plus sulfonylurea (Avandaryl™, Duetact™), dipeptidyl peptidase 4 inhibitor plus biguanide (Janumet®), sulfonylurea plus biguanide (Metaglip®, Glucovance®), glucosidase inhibitor plus sulfonylurea (Glyset®).

- **Indications:** Fewer pills with combined therapeutic effect.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Same as with each of the classifications of medications individually.
- **Contraindications:** Same as with each of the classifications of medications individually.

Other Diabetic Medications

Byetta® (incretin mimetic): Adjunctive therapy to biguanides, sulfonylureas, or thiazolidinedione. Pregnancy Category C: Not recommended for nursing mothers. Side effects include GI upset, hypoglycemia, dizziness, headache, reduced appetite, weight loss, GERD, hyperhidrosis. Precautions: GI disorders, renal impairment Contraindications: Type 1 diabetes, ketoacidosis.

Dipeptidyl peptidase 4 inhibitor: Sitagliptin (Januvia®): Pregnancy Category B: Has not been studied in nursing mothers. This drug decreases glucagon release and increases insulin release and synthesis. Monitor renal function. Side effects include nasopharyngitis, URI, headache, rash. Contraindications: Type 1 diabetes, ketoacidosis.

Glucagon: For acute hypoglycemia; causes liver to increase blood sugar levels. Pregnancy Category B: No data on using glucagons with nursing mothers, so caution is advised. Complications include GI upset, urticaria, respiratory distress, hypotension. Contraindicated in pheochromocytoma.

Prandin: Reduces glucose production. Can be used with biguanides and thiazolidinedione. Pregnancy Category C: Not recommended for nursing mothers. Side effects can include hypoglycemia infection, constipation, arthralgia, back or chest pain.

Glucosidase inhibitor: Example Acarbose (Precose®). Inhibits absorption of carbohydrates by intestines. Pregnancy Category B: May be used in nursing women. Contraindications: Ketoacidosis, cirrhosis, inflammatory bowel disease, colonic irritation, disease with marked disorders of digestion and absorption. Side effects include transient flatulence, diarrhea, abdominal pain, Type 1 diabetes, predisposition to intestinal obstruction and disorders of digestion or absorption. Adverse reactions with hypoglycemia. Side effects include GI upset with metformin, peripheral edema.

Cholesterol-Lowering Drugs

HMG-CoA Reductase Inhibitors

- **Examples:** Atorvastatin (Lipitor®), fluvastatin (Lescol®), lovastatin (Mevacor®, Altoprev™), pravastatin (Pravachol®), rosuvastatin calcium (Crestor®), simvastatin (Zocor®).
  Pregnancy Category X: Not recommended for nursing mothers.
- **Indications:** Primary hypercholesterolemia and mixed dyslipidemia.
- **Administration:** By mouth with evening meal.
- **Adverse reactions and side effects:** Use caution in renal impairment, myopathy, alcoholism, myositis including rhabdomyolysis (pain in muscles and joints). Increased liver enzymes (stop drug if AST or ALT increases by three times normal). Grapefruit juice may cause higher blood levels and increase risk for toxicity.
- **Contraindications:** Hypersensitivity, active liver disease, pregnancy or lactation, concurrent use of gemfibrozil or azole antifungals.

Selective Cholesterol Absorption Inhibitors

- **Examples:** Ezetimibe (Zetia®), Vytorin® (combination of ezetimibe and simvastatin).
  Pregnancy Category X: Not for use in nursing mothers.
- **Indications:** Adjunct to diet alone or in combination with a statin.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** GI distress, flatulence, dyspepsia, anorexia, test liver function as with statin drugs.
- **Contraindications:** Active liver disease, unexplained persistent elevation in serum transaminases.

Resins

- **Examples:** Cholestyramine (Questran®, Questran® Light, Prevalite®, LoCholest®, LoCholest® Light), colestipol (Colestid®), colesevelam HCL (WelChol®).
  Pregnancy Category D: Use with caution in pregnancy and with nursing mothers.

- **Indications:** These drugs reduce LDL. Often used off label for antibiotic-induced pseudomembranous colitis, infantile diarrhea, and digoxin toxicity.
- **Administration:** Comes in powder—mix with juice, water, or cereal.
- **Adverse reactions and side effects:** May interfere with vitamin K absorption so monitor bleeding and bruising. Hyperchloremic acidosis, joint pain, urticaria, tongue irritation.
- **Contraindications:** Complete biliary obstruction.

Fibrates

- **Examples:** (Fibric acid derivatives) Gemfibrozil (Lopid®) fenofibrate (Antara®, Lofibra®, Tricor®, and Triglide™), clofibrate (Atromid-S).
  Pregnancy Category C: Not recommended for nursing mothers.
- **Indications:** Reduces triglyceride production. Also reduces very low density lipoproteins.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Avoid combining with statins or monitor carefully if given with statins because increases possibility of myositis. Upset stomach, diarrhea, and nausea.
- **Contraindications:** Hepatic or renal dysfunction. Primary biliary cirrhosis, gallbladder disease.

Niacin

- **Examples:** Nonprescription niacin and prescription Niaspan® (timed-release formulation).
  Pregnancy Category C: Not recommended for nursing mothers.
- **Indications:** In patients with cardiovascular disease and high cholesterol, niacin in combination with other cholesterol medications can slow down or reduce atherosclerosis, the hardening of arteries resulting from plaque buildup.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** It is important to check liver enzymes in patients taking these types of OTC medications. Flushing, GI distress, elevated liver enzymes Increased blood sugar, muscle pain or tenderness, liver enzyme increase, shortness of breath, chills, dizziness, pain, indigestion.
- **Contraindications:** Significant hepatic dysfunction, known sensitivity to niacin.

Contraceptive Medications

Combined Estrogen and Progestin Contraceptives

- **Examples:** Junel®, Levlen®, Nordette®, Tri-Sprintec®, Yaz®.
- **Indications:** To prevent pregnancy, to regulate hormones and regulate menstrual cycle, acne. Some types have a consistent level of estrogen and progesterone throughout the cycle until the withdrawal period when the placebo pills are taken; some have different levels of estrogen and progesterone to be more like the woman's natural cycle.
- **Administration:** One pill daily. If one pill missed, take two the next day. If two pills missed, take two pills for the next 2 days. If more than two pills are missed, stop pills, allow for a menstrual period, and restart new pack.
- **Adverse reactions and side effects:** Use with caution with smoking, obesity, current breast cancer, complicated or prolonged diabetes, lupus, severe migraines, breastfeeding. Use backup contraceptive method when taking antibiotics. Breakthrough bleeding: Check for pregnancy, increase dosage of both estrogen and progestin.
- **Contraindications:** Absolute contraindications: Hypertension, history of blood clots.

Progestin-Only Pills

- **Examples:** Orvette®, Micronor®, Nor-QD®, Errin®.
- **Indications:** To prevent pregnancy. May use during breastfeeding. May enhance sexual enjoyment. Rapid return to baseline fertility. Better than combination pill for smokers older than age 35 years.
- **Administration:** One pill daily at the same time each day. No catch-up regimen is effective.
- **Adverse reactions and side effects:** Amenorrhea, irregular bleeding, heavy bleeding, abdominal pain. Use with caution in patients with current or history of breast cancer, active hepatitis, hepatic failure, jaundice, colitis. Should not be taken with medications that increase hepatic clearance such as rifampin, carbamazepine, phenytoid, phenobarbital, primidone, St. John's wort, griseofulvin.
- **Contraindications:** Breast carcinoma, undiagnosed abnormal gynecologic bleeding, liver tumors.

Depo Provera Injection

- **Indications:** Prevention of pregnancy.
- **Administration:** One subcutaneous injection every 3 months.
- **Adverse reactions and side effects:** Significant weight gain possible. Amenorrhea, irregular menses during first several months. Slow return to baseline fertility. Decreased bone mineral density (reversible). Causes increase in serum glucose, may cause severe headaches, acne, hirsutism, hair loss, increases LDL cholesterol and decreases HDL cholesterol.
- **Contraindications:** Do not use with active viral hepatitis, breast cancer, MI, stroke, current VTE, undiagnosed vaginal bleeding.

Vaginal Contractive Ring (NuvaRing®)

- **Indications:** Prevention of pregnancy, combination estrogen and progestin—releases less estrogen daily than pills.
- **Administration:** Placed intravaginally and left in place for 3 weeks then removed for 1 week to allow withdrawal bleeding. Tampons, vaginal yeast creams, and lubricants can be used with ring in place.
- **Adverse reactions and side effects:** Complications similar to those with the combination pill. Do not douche with ring in place. Do not remove ring for intercourse.
- **Contraindications:** Same as with combination oral contraceptive pill.

Important Miscellaneous Medications

Proton Pump Inhibitors

- **Examples:** Esomeprazole (Nexium®), lansoprazole(Prevacid®), omeprazole (Prilosec®, Zegerid®), pantoprazole (Protonix®).
  Pregnancy Category C: Not recommended for nursing mothers or for children.
- **Indications:** Used for gastroesophageal reflux or erosive esophagitis.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Headache, diarrhea, abdominal pain, constipations, cough.
- **Contraindications:** Metabolic alkalosis, hypocalcemia.

Levothyroxine

- **Examples:** Levothroid®, Levoxyl®, Synthroid®.
- **Indications:** To replace thyroid hormone.
- **Administration:** By mouth. Start low and go slow. Repeat TSH monthly until in normal range.
- **Adverse reactions and side effects:** Absorption reduced by calcium, bile acid sequestrants, iron. Hyperthyroidism (racing pulse, headache), decreased bone mineral density, transient alopecia.
- **Contraindications:** Uncorrected adrenal insufficiency, untreated thyrotoxicosis, acute MI.

Asthma Medications

Beta$_2$ Agonists

Short-acting beta$_2$ agonists: Albuterol, bitolterol, pirbuterol, terbutaline.

- **Indications:** Useful in treating acute asthma attack.

Long-acting beta$_2$ agonists: Salmeterol, formoterol, sustained-release albuterol.

- **Indications:** Not for use with acute asthma attack.

Both short-acting and long-acting beta$_2$ agonists

- **Administration:** Multidose inhaler.
- **Adverse reactions and side effects:** Precautions in cardiovascular disease. Avoid MAOIs and tricyclics. Tremor, nervousness, headache, dizziness, hyperactivity, insomnia, weakness, tachycardia, epistaxis, hypokalemia, paradoxical bronchospasm.
- **Contraindications:** None.

Leukotriene Antagonists

- **Examples:** Zafirlukast, montelukast.
  Pregnancy Category B: Not studied in nursing mothers.
- **Indications:** Prevention of asthma, not to be used for acute attacks.
- **Administration:** By mouth.
- **Adverse reactions and side effects:** Headache, fatigue, fever, GI upset.
- **Contraindications:** None.

Inhaled Corticosteroids

- **Examples:** Beclomethasone, budesonide, flunisolide, fluticasone, triamcinolone.
- **Indication:** Reduction of bronchial inflammation. Not used for acute attacks.
- **Administration:** Multidose inhaler, powered inhaler.
- **Adverse reactions and side effects:** GI upset, oral candidiasis, headache, upper respiratory infection, pharyngitis, GI distress, dizziness.
- **Contraindications:** Not for primary treatment of acute attack.

Anticholinergic Agents for Asthma and COPD

- **Examples:** Ipratropium (Atrovent).
  Pregnancy Category B: Not well studied in nursing mothers.
- **Indication:** Additive benefit to inhaled beta$_2$ agonists in severe exacerbations.
- **Administration:** Multidose inhaler.
- **Adverse reactions and side effects:** Avoid in narrow-angle glaucoma. GI or GU obstruction.

Complementary and Alternative Therapies

Complementary and alternative medicine is the term for medical products and practices that are not part of standard care. Standard care is what medical doctors, doctors of osteopathy, and allied health professionals, such as registered nurses and physical therapists, practice. Alternative medicine includes treatments that fall outside of standard ones. Complementary medicine means using nonstandard treatments alongside standard treatments, such as tai chi or massage, in addition to prescribed medication.

Conventional health-care providers are learning more about complementary and alternative medicine because they recognize that more than half of people try some kind of alternative treatment. Many health-care institutions have begun integrating therapies that aren't part of mainstream medicine into their treatment programs, and a number of medical and nursing schools now include education on nontraditional techniques in their curriculum. As complementary and alternative therapies prove effective, they're being combined more often with conventional care. This is known as integrative medicine.

The primary principles of complementary and alternative health care include the following:

- Prevention is key to good health.
- The body has the ability to heal itself.
- Learning and healing go hand in hand.
- The focus is on holistic care that treats the patient as a whole person greater than the sum of his or her parts.

Herbs

Many herbs and supplements (Hs/Ss) commonly used could not be presented in this section because of space limitations. When practicing, you should have current, reliable sources available to you because many of your clients will be using these substances with prescribed drugs or in place of them. See the References found in the Tools tab for a few suggested sources.

Warnings

Clients often fear telling their practitioner they use Hs/Ss. Gain your client's trust to assess for Hs/Ss that could be harmful to them or interact with other drugs/Hs/Ss used. Most Hs/Ss are not FDA-approved. **Remember: "Natural" does not equal "safe."** Anything taken into one's body by any route is possibly harmful. Unsafe adulterants, substances substituted partially for another without acknowledgment, may be found in some Hs/Ss. Standardized doses are not guaranteed.
Advise the client to do the following:

- Buy products from reliable, well-known sources, such as by looking for U.S. Pharmacopeia on label.
- Check with reliable, professional sources for use, actions, contraindications, side effects, and interactions because data on Hs/Ss change frequently.
- Avoid products containing multiple herbs and supplements.
- Be aware of dangers of blood thinners.
- Check with provider about stopping products prior to surgery or dental procedures.
- Always tell his or her provider or pharmacist what herbs or supplements are being used or taken in addition to prescribed and OTC approved drugs.

Key

A = Strong scientific evidence for this use
B = Good scientific evidence for this use
C = Unclear scientific evidence for this use
D = Fair scientific evidence against this use
F = Strong scientific evidence against this use

Grades in this document may be for just a few of the indications for the herbs and supplements discussed.

Aloe Vera

Mucilaginous gel from inner portion of plant leaf.

- **Generally used for:** Topical therapy for skin irritations, burns, painful excoriations, lesions, ulcerations, psoriasis, frostbite, wound healing.

- **Contraindications:** None for topical application; **long-term ingestion as cathartic may cause serious cardiac, GI, renal, other reactions or interactions.**
- **Side effects and interactions:** May be contaminated with latex or anthraquinones; may cause rash if applied before sun exposure. If allergic to garlic, onions, tulips or similar plants, aloe may cause allergy. Prolonged use of aloe gel may cause hives, rash.
- **Usual dosage and route:** *Topical:* Apply liberally 3–5 times daily prn.
- **Other:** Avoid aloe juice or aloe latex that comes from inside leaf lining; may contain anthraquinone glycosides. Consult provider/pharmacist if taking aloe as stimulant laxative/cathartic orally; oral route considered unsafe for children, for pregnant or lactating women, or for long-term use, and tolerance easily develops. Possible hypoglycemic effects on blood sugar if taken orally require monitoring. Avoid any aloe injections; may be lethal.
- **Scientific evidence for use:** Grade B for genital herpes in men, psoriasis vulgaris, seborrhea, dandruff.

Black Cohosh

Derived from rhizome and root of North American buttercup family.

- **Generally used for:** Alternative to estrogen therapy in menopause; some research says it helps with menopause symptoms, such as hot flashes, migraine headache, sleep disturbance, mood lability, vaginal dryness, heart palpitations, and increased perspiration.
- **Contraindications:** Liver disease because use may cause liver damage or failure. Unclear if safe with hormone-sensitive conditions, such as breast cancer, uterine cancer, and endometriosis. Safety in pregnancy and lactation not established.
- **Side effects and interactions:** Usually tolerated well in advised dosages up to 6 months. Reported side effects are constipation, loss of bone mass, slow or irregular heartbeat, low BP, nausea and vomiting, muscle damage or heaviness in legs, and possible vaginal bleeding. With high dosages, frontal headache, visual disturbances, dizziness, and perspiration may occur. May interact with drugs or herbs that act as antiplatelets or anticoagulants, increasing risk of bleeding. Avoid using black cohosh with tamoxifen or any hormone-based drug; with antidepressants, antihistamines, antioxidants; may change the way the liver metabolizes drugs.

- **Usual dosage and route:** Usual dosage: 40–80 mg 2× daily.
- **Other:** Note that blue cohosh and white cohosh are unrelated plants from black cohosh.
- **Scientific evidence for use:** Grade C for menopausal symptoms and menstrual migraine; more studies recommended.

Chamomile

Derived from dried heads of German/Hungarian chamomile flower.

- **Generally used for:** Antispasmodic, anti-inflammatory, antimicrobial, antiflatulent, mild sedative, calmative; often used to quiet GI spasms and upset; may be useful for wound healing.
- **Contraindications:** Do not use with children, in pregnancy, and during lactation; do not use if allergic to asters, ragweed, chrysanthemums—may cause severe allergic response/anaphylaxis.
- **Side effects and interactions:** Vomiting with highly concentrated tea; drowsiness may occur; could increase bleeding if taken with antiplatelets, anticoagulants, NSAIDs; atopic dermatitis reported.
- **Usual dosage and route:** Usually consumed as tea, 1–4 cups daily; if taken as capsule or tablet, divided doses of 400–1,600 mg daily. Tinctures may contain alcohol.
- **Scientific evidence for use:** Grade C for all studied uses; additional research suggested.

Cranberry

Comes from the American cranberry in juice or extract form.

- **Generally used for:** Urinary tract infection (UTI) prevention; said to interfere with bacteria adhering to cells lining bladder.
- **Contraindications:** Individuals allergic to cranberries or blueberries.
- **Side effects and interactions:** Ingestion of large amounts may cause GI disturbances. Cranberry products taken with warfarin or other such drugs or substances may increase bleeding risk.
- **Scientific evidence for use:** Grade B for UTI prevention. Grade D for prevention in children with neurogenic bladder and prostate cancer radiation therapy side effects. Grade C for all other studied indications.

Echinacea

Comes from above-ground parts and roots of purple coneflower, a member of the aster family. The *purpurea* variety appears to be the most useful and potent.

- **Generally used for:** Colds and flu in adults; reduced duration and symptoms if used when symptoms first start. Said to stimulate immune response.
- **Contraindications:** Those with allergy to aster and daisy family plants; concern with allergy to echinacea decreasing immune response in persons with HIV or AIDS or other immunosuppressive/autoimmune condition.
- **Side effects and interactions:** Allergic reactions, fever, sore throat, abdominal discomfort, diarrhea, nausea, and vomiting reported.
- **Usual dosage and route:** Capsules orally: 500–1,000 mg tid × 5–7 days. Extract orally: 300–800 mg 2–3 times daily.
- **Other:** May interfere with drug clearance in liver by some enzymes. Long-term use not advised. Use only for short durations when upper respiratory infection (URI) suspected. Has been used as topical for wounds, skin ulcers. Do not use as injection. Tinctures may contain alcohol.
- **Scientific evidence for use:** Grade C for prevention and treatment of URIs in adults; research reports mixed as to effectiveness.

Feverfew

Comes from dried leaves of aster family flower.

- **Generally used for:** Second-line prevention of migraine headache.
- **Contraindications:** Pregnancy, lactation, children, sun sensitivity, bleeding disorders; use prior to surgery or procedures that involve bleeding risk.
- **Side effects and interactions:** Ulcers, swelling, irritation, bleeding of lips, mouth, gums if came in contact with leaves; some burning, indigestion, nausea, constipation, diarrhea, flatulence reported with capsule use. Rebound headache and other symptoms reported if stopped suddenly. May increase risk of bleeding if taken with other drugs or substances that increase risk also.

- **Usual dosage and route:** Capsules: 50–114 mg daily of powdered leaves or 70–86 mg daily of chopped leaves.
- **Other:** Does not appear to help ease migraine headache once headache begins or is established.
- **Scientific evidence for use:** Grade B for migraine headache prevention.

Garlic

Comes from lily family bulbs (dried or fresh). Primary active ingredient, allicin, released when garlic crushed.

- **Generally used for:** Reducing total cholesterol, LDL, and triglyceride levels. Some reports of reduction in blood pressure.
- **Contraindications:** Bleeding disorders; stop 1–2 weeks prior to surgery or dental procedures that involve bleeding risk; restrict use with other drugs or substances that increase risk of bleeding.
- **Side effects and interactions:** Allergic reactions (rash or skin burns); asthmatic episodes, fever, chills, itching, runny nose, dizziness, sweating, headaches, bad breath, body odor, GI upset. May lower blood sugar or thyroid hormone. May interact to increase bleeding if taken with other substances that affect bleeding; may alter liver enzyme system.
- **Usual dosage and route:** For hyperlipidemia and hypertension: 600–1,200 mg in divided doses 3× daily; advise noncoated dehydrated garlic powder standardized to 1.3% allicin content.
- **Other:** If consumed in normal amounts in food, may be safe in pregnancy, lactation, and children. May increase human growth hormone excretion.
- **Scientific evidence for use:** Grade B for small reductions of high cholesterol. Most other indications received Grade C. Grade D for diabetes, gastric/duodenal ulcers.

Ginkgo

Comes from maidenhair tree (Ginkgo biloba) of ginkgo family.

- **Generally used for:** Intermittent claudication; memory, cognitive, social functioning impairment; dementia of Alzheimer's disease; vascular dementia or cerebral insufficiency from atherosclerosis; Parkinson's disease; PMS symptoms.

- **Contraindications:** Avoid in pregnancy, lactation, children. Should be stopped 2 weeks before surgery or for provider-designated period. Use caution in persons with bleeding disorders.
- **Side effects and interactions:** Side effects less than 1%, generally well tolerated. Side effects include GI disturbances, headache, dizziness, vertigo, skin hypersensitivity. May interact with drugs or herbs that act as anticoagulants, antiplatelets, MAOIs, diuretics, anticonvulsants.
- **Usual dosage and route:** Dementia: 120–360 mg of 24% ginkgo flavonoid glycosides and 6% terpene lactones 2–3× daily. For healthy adults, same dose range suggested. Common dose is 40 mg tid or 80 mg bid.
- **Scientific evidence for use:** Grade A for claudication, multiinfarct, and dementia of Alzheimer's disease. Grade B for cerebral insufficiency. Grade C for age-associated memory impairment, memory enhancement in healthy persons, PMS, altitude sickness, and a number of other conditions. Several conditions studied with small samples; one study received D grade.

Ginseng

Comes from root of ginseng plant; also known as *Panax ginseng*.

- **Generally used for:** Improved mental performance and alertness, stress resistance, Type 2 diabetes, exercise performance, fatigue, hypertension, immune system enhancement, sense of well-being.
- **Contraindications:** Avoid if allergic to plants in *Araliaceae* family. Use with caution in persons with coagulation, cardiac, diabetic, hypoglycemic, insomnia, schizophrenic disorders. Avoid in pregnancy, lactation, children, 1–2 weeks before any surgery or dental work.
- **Side effects and interactions:** Skin rash, itching, sore throat, appetite loss, excitability, anxiety, depression, insomnia, and diarrhea; may cause blood sugar level decrease, estrogen-type effects (bleeding, breast tenderness or enlargement, altered menses), nosebleeds, interference with warfarin effects, erection difficulties, manic symptoms, change in heart rhythm.
- **Usual dosage and route:** Capsules: 100–500 mg of 4% ginsenosides (standardized extract) 1–2× daily. See references for specific dosages for conditions and other routes and dosages.
- **Scientific evidence for use:** Grade B for improved mental performance and learning and Type 2 diabetes. Grade C for all other studied uses.

Red Yeast Rice

Grown on rice fermented with *Monascus purpureus* yeast.

- **Generally used for:** Primarily, to lower total cholesterol, LDL cholesterol, and triglycerides. Other uses are to improve coronary heart disease, circulation, diabetes, GI problems. Contains statin substances, mainly lovastatin.
- **Contraindications:** In clients with liver disease. Caution if bleeding disorder or taking drugs, herbs, supplements that increase risk of bleeding. Do not use with prescription cholesterol-lowering drugs, alcohol, or drugs toxic to liver. Avoid use with cyclosporine, ranitidine, some antibiotics that increase risk of rhabdomyolysis.
- **Side effects and interactions:** Gastritis, abdominal pain, headache, and side effects similar to those with lovastatin. May cause additive effects with GABA-affecting drugs, alter blood sugar levels, interact with niacin, thyroid medications, digoxin, some vitamins, herbs, and supplements such as St. John's wort, vitamin A, coenzyme Q 10. Grapefruit can increase red rice levels.
- **Usual dosage and route:** *Capsules:* 1,200 mg concentrated powder 2× daily orally with food.
- **Scientific evidence for use:** Grade A for lowering cholesterol, LDL, triglycerides; Grade C for coronary heart disease, circulation, diabetes.

Saw Palmetto

Comes from dried fruits of southern U.S. palm tree.

- **Generally used for:** Primarily for BPH; male-pattern hair loss, prostate cancer, prostatitis, chronic pelvic pain, bladder disorders (underactive bladder); also used as mild diuretic, anti-inflammatory, antiseptic, sedative. Similar in action to finasteride.
- **Contraindications:** Avoid in children, pregnancy, lactation; caution with clients with stomach, liver, heart, lung, bleeding disorders or if taking hormones or having surgery or dental procedure.
- **Side effects and interactions:** GI upset, occasional allergic response; other reported side effects include ulcer, jaundice, headache, dizziness, depression, muscle pain, insomnia, heart rhythm irregularity/disorder, breathing problems, hypertension, chest pain.

- **Usual dosage and route:** 160 mg 2× daily or 320 1× daily of 80%–90% liposterolic extract. Liquid or dry extract, tea, or whole berries also used; see References for more information.
- **Scientific evidence for use:** Grade A for BPH. Grade C for male-pattern hair loss, prostate cancer, prostatitis, chronic pelvic pain syndrome, bladder problems.

St. John's Wort

Comes from dried flower tops of St. John's family plant.

- **Generally used for:** Primarily, mild or moderate depression; also used for anxiety, stress, PMS, perimenopausal symptoms, SAD, OCD, severe depression, atopic dermatitis.
- **Contraindications:** Do not use for severe major depression; has inadequate effect that may increase client's risk of suicide. Do not use with drugs to treat HIV/AIDS (decreases effectiveness); with other antidepressants (wait 2 weeks to use St. John's wort after discontinuing any antidepressant or vice versa); with transplant clients (decreases blood levels of cyclosporine); 5 days before any surgery with anesthesia (may prolong sedation); with imatinib (increases clearance); or with any drug or substance that increases bleeding. Do not use with children, pregnant or lactating women.
- **Side effects and interactions:** Incidence of side effects: photosensitivity, GI upset, insomnia, anxiety, headache, fatigue, sedation, skin rash, sexual dysfunction, dry mouth, dizziness, altered menses, bleeding, decreased effectiveness of birth control pills leading to unwanted pregnancy.
- **Usual dosage and route:** *Capsules:* 300 mg of 0.3% hypericin (active ingredient) 3× daily. For other forms and dosages, see References.
- **Scientific evidence for use:** Grade A for mild-to-moderate depressive disorder. Grade C for all other studied uses *except* Grade D for HIV or AIDS, social phobia, and severe depression.

Valerian

Comes from root (dried or fresh) of valerian family plant.

- **Generally used for:** Sleep aid for insomnia or antianxiety therapy. Said to be sedative.

- **Contraindications:** Do not use in children, pregnancy, lactation. Avoid use with drugs that increase sedation or if operating machinery.
- **Side effects and interactions:** Usually well tolerated. Liver toxicity reported in a few cases. Side effects include GI upset, headache, feeling uneasy or excited, dizziness, ataxia, hypothermia, reduced concentration or cognitive function; insomnia with chronic use. Hangover effect with high doses. May interact negatively with sedatives, narcotics, SSRIs, tranquilizers, and St. John's wort.
- **Usual dosage and route:** Taken 30–60 minutes before bedtime: *Capsules:* 300–1,800 mg; *Liquid extract:* 400–900 mg. Note that extract may contain alcohol. Also used as tea.
- **Scientific evidence for use:** Grade B for insomnia. Grade C for anxiety. Grade D for sedation.

Supplements

Supplements are used to provide daily requirements of vitamins and minerals not in the diet. Supplements are beneficial as long as doses over the normal daily requirement are not used for long periods. Remember fat-soluble vitamins (vitamin A, D, E, and K) can remain in the body for long periods because they are excreted more slowly. This can cause toxicity and must be monitored.

Calcium

A mineral that is chemically combined with another substance (called chelation), such as carbonate, citrate, or lactate, to form supplement preparations. Also available in many foods, such as milk, cheese, green leafy vegetables, whole grains, egg yolk, nuts, legumes.

- **Generally used for:** Necessary in body for strong structure of bones and teeth (99%); other 1% used in blood clotting, nerve function and transmission, muscle contraction, blood vessel constriction, cell membrane permeability, hormone and enzyme secretion. Supplemental calcium used to ensure adequate availability for body needs, prevent bone loss, deficiency, high blood phosphorous level, osteoporosis prevention and therapy, magnesium toxicity, high blood potassium level, hypertension, PMS, colorectal cancer.

- **Contraindications:** Hyperparathyroidism, hypercalcemia, hypercalciuria, hypervitaminosis D, renal insufficiency; calculi; sarcoidosis, bone tumors, digitalis toxicity, ventricular fibrillation, known allergy or hypersensitivity to calcium supplements or ingredients.
- **Side effects and interactions:** Considered safe for adults, in pregnancy, lactation in recommended dosages. Extra calcium excreted in urine. Risk of calculi if taken without food or in high doses when prone to stones. Smoking may reduce absorption and bone mineral density. May affect cardiac rhythm if client has arrhythmia. Excess calcium associated with GI symptoms, thirst, abdominal pain, dry mouth, urinary frequency, calcium deposition in heart and kidneys. If deficient calcium, numbness, tingling muscle twitches and spasms.
- **Usual dosage and route:** Vitamin D essential for calcium absorption. For healthy children 4 years of age and older, adolescents, men and nonpregnant women older than 18 years: 1,000 mg daily via diet or supplement in divided doses such as 500 mg 2× daily. Adults 50 years or older need 1,200–1,500 mg daily via diet or supplement in divided dosages, such as 500 mg 3× daily.
- **Other:** From oyster or shell sources; may contain lead.
- **Scientific evidence for use:** Grade A for gastric hyperacidity (antacid), bone loss prevention, calcium deficiency. Used IV as calcium chloride for CPR, to lower high blood phosphorus. To help prevent/treat osteoporosis, to lower high magnesium levels. Grade B for hypertension, PMS, for muscle cramps with black widow spider bite. All other studied uses have Grades C or D.

Chondroitin Sulfate

Made from shark or beef cartilage, bovine trachea, or synthetic sources.

- **Generally used for:** Symptoms of OA joint degeneration; used alone or in combination with glucosamine sulfate (see Glucosamine sulfate); bladder control in disorders such as interstitial cystitis, overactive bladder, and unstable bladder.
- **Contraindications:** Avoid use in pregnancy, lactation.
- **Side effects and interactions:** Generally well tolerated for several years. Rare reports of headache, hives, rash, motor problems, euphoria, breathing problems, photosensitivity, asthma symptoms, elevated BP, edema, chest pain, and GI changes or upset.

- **Usual dosage and route:** *Adults:* 200–400 mg bid orally 2–3× daily or 800–1,200 mg 1× daily.
- **Scientific evidence for use:** Grade A for osteoarthritis. Grade B for bladder control. Grade C for other studied uses.

Glucosamine Sulfate

Found in healthy cartilage and synovial fluid; made from exoskeletons of marine animals or synthetic formulations.

- **Generally used for:** Proven to improve symptoms of mild-to-moderate knee OA. Other uses include OA of other joints, chronic venous insufficiency, leg pain, RA, inflammatory bowel disease, TMJ.
- **Contraindications:** In children, pregnancy, lactation. Use with caution for clients with kidney disorders, diabetes, or hypoglycemia because it may alter blood sugar levels. Use with caution in patients with bleeding disorders or taking drugs that may alter bleeding.
- **Side effects and interactions:** Generally well tolerated. Reported side effects include GI alterations and upset, insomnia or drowsiness, headache, skin rash or reactions, nail changes, photosensitivity, temporary BP and heart rate increases temporarily.
- **Usual dosage and route:** *Adults:* 500 mg 3× daily (tabs or caps). Limited research on 1,500 mg 1× daily. Studies of use several weeks up to 3 years.
- **Scientific evidence for use:** Grade A for knee OA. Grade B for general OA. Grade C for all other studied uses.

Melatonin

This is a natural product produced in the human brain by the pineal gland during darkness, which is generally during sleep. Synthetic melatonin made in laboratories.

- **Generally used for:** Mainly for sleep disorders including jet lag, delayed sleep phase syndrome, insomnia, sleep disturbances, sleep enhancement, Alzheimer's disease sleep disorders.
- **Contraindications:** Avoid when operating any dangerous machinery, in pregnancy, and during lactation.
- **Side effects and interactions:** Generally considered safe for short-term use at recommended dosages. Side effects reported: GI upset, mood

lability, headache, dizziness, fatigue, sleepiness, irritability, sleep-cycle alterations, vivid dreams, sleep walking, confusion, disorientation, ataxia, skin reactions, bleeding alterations, seizure risk increase, psychotic symptoms with overdose. May improve or worsen some eye disorders such as glaucoma.

- **Usual dosage and route:** *For sleep disturbances:* 0.1–5.0 mg at bedtime; for jet lag 0.5—5.0-mg fast-release melatonin taken at bedtime for 4 days after traveling east. Fast-release formulations appear to be more effective than extended-release melatonin for jet lag/sleep problems.
- **Other:** Small doses such as 0.1 mg may be effective for sleep disturbances; urge clients to first try small doses for trial time frame.
- **Scientific evidence for use:** Grade A for jet lag. Grade B for delayed sleep syndrome, insomnia in elderly individuals, sleep disturbances in children with neuropsychiatric disorders, and betterment of sleep in healthy persons. Grade C for all other studied uses.

Omega-3 Fatty Acids

Fish and fish oil contain DHA plus EPA; nuts and vegetable oils contain ALA. EPA and DHA come from fatty fish.

- **Generally used for:** High BP; hypertriglycerides; elevated CRP; cardiovascular disease, both primary and secondary; cyclosporine toxicity with transplants; rheumatoid arthritis; angina pectoris; asthma; cancer prevention; cardiac arrhythmias; colon cancer and other cancers; and numerous other studied uses.
- **Contraindications:** For EPA/DHA source, avoid in clients with bleeding disorders.
- **Side effects and interactions:** Most common are GI disturbances or complaints; rarely skin reactions; some psychiatric alterations. Liver function tests may be altered.
- **Usual dosage and route:** *For healthy adults:* Eat fatty fish 2× per week or take one or two 1.0 to 1.2 gm capsules daily with meals. Recommended dosage of daily EPA-DHA is 0.3–0.5 grams; of daily alpha-linolenic acid, 0.8–1.1 grams.
- **Scientific evidence for use:** Grade A to reduce high BP but necessary high dose may cause bleeding; EPA + DHA/fish oil decrease triglyceride levels and may lower risk of second heart attack. Grade B because regularly eating fish may lower mortality rate from heart disease,

help protect transplant patients from cyclosporine toxicity, and improve some symptoms of rheumatoid arthritis. Most other studied uses received Grade C. Grade D for hypercholesterolemia, diabetes, and prevention of heart or kidney transplant rejection.

Vitamin B_6 (Pyridoxine)

- **Generally used for:** Required for serotonin and norepinephrine synthesis and myelin formation, treating anemia, neuritis, preventing mal effects of some antibiotics, seizures in newborns from high maternal doses or genetic pyridoxine dependency. Other uses studied include use in elderly individuals to improve immune function, to lower high homocysteine levels and C-reactive protein. Also used to correct B_6 deficiency in women using hormonal contraception.
- **Side effects and interactions:** Usually safe in recommended dosages; reactions to B_6 reported such as acne, skin reactions, photosensitivity; other side effects include GI upset, headache, sleepiness, sensory neuropathy, paresthesia, breast tenderness or growth, elevated AST, SGOT, seizures if large doses taken.
- **Usual dosage and route:** As maximum supplement for certain conditions above recommended RDAs. *Adults and pregnant or lactating women older than age 18 years:* Recommended maximum supplement for daily intake 100 mg. *Children younger than 18 years:* Consult References.
- **Other:** *Good sources from food:* Vegetables such as carrots, spinach, peas; cereal grains; potatoes; dairy products such as milk and cheese; eggs; fish; meat; liver; flour.
- **Scientific evidence for use:** Grade A for pyridoxine deficiency, neuritis, hereditary sideroblastic anemia, people taking cycloserine to prevent adverse effects, newborn pyridoxine-dependent seizures. All other studied uses

Vitamin B_9 (Folic Acid)

- **Generally used for:** Folate deficiency, megaloblastic anemia, prevention of birth defects such as neural tube defects, pregnancy loss.
- **Contraindications:** If allergic to product ingredients; rule out pernicious, aplastic, and normocytic anemias from vitamin B_{12} deficiency because B_9 may mask symptoms. Avoid in those with seizure disorders.

- **Side effects and interactions:** Tolerated well; side effects reported include stomatitis, alopecia, zinc depletion, erythema, pruritus, flushing of skin, rash, itching, urticaria, nausea, bloating, cramps, diarrhea, flatulence, change in urine color. Central nervous system symptoms, impairment, and side effects seen with high does.
- **Usual dosage and route:** 400 mcg daily for adults. Pregnant adult women 600 mcg daily. For lactating adult women 500 mcg daily; maximum allowable levels 800–1,000 mcg daily
- **Other:** *Good food sources:* Many foods fortified today such as cereals, baked goods; other sources include dark leafy vegetables such as spinach; broccoli; lettuce; asparagus; okra; fruits such as lemons, melons, and bananas; legumes; beef organ meat, such as liver and kidney; some juices such as orange and tomato; and mushrooms. Found in combination with other B vitamins in many supplements.
- **Scientific evidence for use:** Grade A for folate deficiency, megaloblastic anemia from folate deficiency, pregnancy complications from deficiency such as birth defects and pregnancy loss. Grade B for methotrexate toxicity. Most other studied uses Grade C. Grade D for Down's syndrome and lometrexol toxicity. Grade F for fragile X syndrome.

Complementary Therapies

Acupuncture and Acupressure

Acupuncture and acupressure are techniques of inserting and manipulating fine filiform needles into specific points on the body with the aim of relieving pain and for therapeutic purposes. According to traditional Chinese acupuncture theory, these acupuncture points lie along meridians along which qi, the body's vital energy, flows. Acupuncture originated in China and is most commonly associated with traditional Chinese medicine (TCM). The acupuncturist decides which points to treat by observing and questioning the patient so as to make a diagnosis according to the tradition that he or she used. Some of the conditions successfully treated with acupuncture include headache, hypertension, muscle and joint pain, fibromyalgia, depression, irritable bowel syndrome, drug dependence, and smoking cessation. Acupuncturists must be licensed in each state in which they practice.

- **Efficacy:** In research studies acupuncture has been shown to decrease pain; improve acne outbreaks; decrease asthma exacerbations; decrease chronic pain including lower back pain, dental pain, and postoperative pain; improve depression symptoms; improve gout; decrease exacerbations of migraine headaches; relieve the pain of arthritis and tendonitis; and improve wound healing.

Aromatherapy

Aromatherapy is the art and science of helping living things toward wholeness and balance using the essential oils that can be extracted from living plants. Essential oils are liquids obtained from plants that evaporate at room temperature with characteristic aromas. Aromatherapy use was documented as early as ancient Babylonia in 5,000 BC. Research has demonstrated that aromatherapy is effective for anxiety, depression, insomnia, and postoperative nausea and vomiting.

- **Efficacy:** In research studies, aromatherapy has been shown to decrease anxiety and stress; decrease postoperative and pregnancy-induced nausea; decrease depression, blood pressure, and insomnia; clear sinuses; increase the immune system by increasing white blood cell production; and improve symptoms of premenstrual syndrome.

Arts Therapies

Arts therapies are forms of expressive therapy. These therapies combine traditional psychotherapeutic theories and techniques with an understanding of the psychological aspects of the creative process. These professionals are employed in many clinical settings with diverse patient populations.

- **Efficacy:** Arts therapy has been shown to decrease depression and improve mood even in patients with severe mental illnesses. Music therapy has been effective in reducing depression, alleviating anxiety, and improving cognition. Drama therapy and dance therapies have been effective in improving cognition, reducing depression, and alleviating anxiety even in cases of severe mental illness.

Chinese Medicine

Traditional Chinese medicine is a medical system that has been used for thousands of years to prevent, diagnose, and treat disease. It is based on the belief that qi (the body's vital energy) flows along 20 meridians (channels) throughout the body and keeps a person's spiritual, emotional, mental, and physical health in balance. TCM aims to restore the body's balance and harmony between the natural opposing forces of yin and yang, which can block qi and cause disease. It includes such treatments as herbal medicine, acupuncture, dietary therapy, Tui na and Shiatsu massage, qigong, and Tai chi TCM theory is extremely complex and originated thousands of years ago through meticulous observation of nature, the cosmos, and the human body. Included in Chinese medicine is herbal therapy and acupuncture.

Chiropractic Medicine

Chiropractic medicine is grounded in the principle that the body can heal itself when the skeletal system is correctly aligned and the nervous system is functioning properly. To achieve this, the practitioner uses his or her hands or an adjusting tool to perform specific manipulations of the vertebrae. When these bones of the spine are not correctly articulated, resulting in a condition known as sublimation, the theory is that nerve transmission is disrupted; this disruption can cause pain in the back and other areas of the body. Chiropractic is one of the most popular alternative therapies currently available. Research has also supported the use of spinal manipulation for acute low back pain. Some anecdotal evidence suggests recommending chiropractic treatment for ailments unrelated to musculoskeletal problems, but there is not enough research-based data to support this. However, a chiropractor may be able to treat problems and diseases unrelated to the skeletal structure by using therapies other than spinal manipulation.

- **Efficacy:** Chiropractic medicine that uses spinal manipulation has been shown to reduce pain and muscle spasms, increase immune globulins, and improve posture.

Feldenkrais

Feldenkrais is an educational system centered on movement, aiming to expand and refine the use of the self through awareness. It is intended for those who wish to improve their movement repertoire, such as dancers, musicians, and artists; for those wishing to reduce pain or limitations in movement; and for those who want to improve their general well-being. Because it uses movement as the primary vehicle for gaining awareness, it is directly applicable to disorders that arise from restricted or habitually poor movement. But as a process for gaining awareness, it can expand a person's choices and responses to many aspects of life: emotions, relationships, and intellectual tasks. The Feldenkrais method holds that there is no separation between mind and body, and thus learning to move better can improve one's overall well-being on many levels. The effect of Feldenkrais has not been studied to date.

- **Efficacy:** Feldenkrais has demonstrated an ability to reduce chronic pain, improve balance and cognition, and reduce stress and anxiety.

Guided Imagery

Guided imagery is a program of directed thoughts and suggestions that guide your imagination toward a relaxed, focused state.

- **Efficacy:** Guided imagery can be used in combination with other therapies such as music therapy or meditation. Guided imagery has been effective in reducing anxiety even in patients with posttraumatic stress disorder, improving mood, and reducing depression.

Healing Touch

Healing touch is a practice derived from an ancient technique called laying on of hands. It is based on the premise that the healing force of the therapist affects the patient's recovery and that healing is promoted when the body's energies are in balance. Practitioners of healing touch believe that by passing their hands over the patient, healers can identify energy imbalances. The major effects of therapeutic touch are relaxation, pain reduction, accelerated healing, and alleviation of psychosomatic

symptoms. Studies have shown that therapeutic touch also has a beneficial effect on the blood because it has the ability to raise hemoglobin values. It also affects brain waves to induce relaxation.

- **Efficacy:** Studies have shown that healing touch is effective in reducing anxiety and stress, increases the function of the immune and adrenal systems, decreases blood pressure, improves depression and pain symptoms, increases endorphins, and improves cognition.

Homeopathy

Homeopathy is a form of alternative medicine first defined by Samuel Hahnemann in the 18th century. A central thesis of homeopathy is that an ill person can be treated using a substance that can produce, in a healthy person, symptoms similar to those of the illness. Practitioners select treatments according to a patient consultation that explores the physical and psychological state of the patient, both of which are considered important to selecting the remedy. Claims to the efficacy of homeopathic treatment beyond the placebo effect are unsupported by the collective weight of scientific and clinical evidence.

- **Efficacy:** Oscillococcinum, a homeopathic remedy, has been shown to decrease length and symptoms of flu. Other remedies have reduced GI distress in children, especially diarrhea, and for arthritis.

Massage

Massage is the application by hand of systematic stroking or soft tissue manipulation for therapeutic purposes, such as the relief of pain and discomfort. Massage is a repetitive pressure motion applied to a body region to break down inflammation and muscle spasm. Massage therapists must be licensed in the state in which they practice.

- **Efficacy:** In research studies massage has been shown to decrease anxiety, insomnia, pain (especially muscle and back pain), stress, and fatigue.

Meditation

Meditation is a technique of quieting the mind that leads to inner feelings of calm and peacefulness and may result in an experience of transcendental awareness and self-realization. The two main types of meditation are as follows:

- *Focusing type,* similar to self-hypnosis, in which the mediator focuses on a repetitive sound or chant, an image, or a pattern of breathing.
- *Opening-up type*, which emphasizes the detached observation of mental events as they occur. Prayer is a type of meditation. People can meditate alone or in groups.
- **Efficacy:** Meditation has been shown to improve cognition; reduce stress, anxiety, and pain; and improve mental outlook.

Reiki

Reiki (pronounced ray-key) is a system of enlightenment and hands-on healing art developed in the early 1900s by Mikao Usui in Japan. It is an art that is passed from master to student. The word *Reiki* comes from two Japanese words, *Rei* and *Ki,* meaning universal life force energy. It is a form of energy healing that is used to reduce stress and increase energy, peace, and feelings of well-being.

- **Efficacy:** In research studies, Reiki has been shown to reduce blood pressure and heart rate, decrease anxiety, improve the immune system by increasing salivary IgA, decrease postoperative pain, and improve function in older adults.

Tai Chi

Tai Chi is an ancient Chinese exercise system that uses slow, smooth body movements to achieve a state of relaxation of both body and mind. Tai chi has five essential qualities: slowness to develop awareness, lightness to make movements flow, balance to prevent body strain, calmness to maintain continuity, and clarity to focus the mind.

- **Efficacy:** Tai chi has been shown to improve balance especially in older adults, decrease fatigue, and increase cognition and mental alertness.

Yoga

Yoga is an Indian word for "union." It indicates a state of union between two opposites, either the body and mind or the individual and universal consciousness. It also refers to a process of uniting the opposing forces in the body and mind to achieve supreme awareness and enlightenment. Yoga is a posturing and breathing technique to induce relaxation. Yoga is a Hindu discipline aimed at achieving a state of perfect spiritual insight and tranquility. In the West, the term is most commonly understood as the physical exercises that are practiced as part of this discipline. Different types of yoga include Hatha yoga, Vinyasa yoga, Ashtanga yoga, Bikram yoga, and Iyengar yoga. Each type has different exercises and postures that assist with relaxation and spiritual insight.

- **Efficacy:** Yoga has been studied and demonstrates positive effects for hypertension, stress, exercise tolerance, depression, fatigue, chronic back pain, and visual discomfort.

Probiotics

Probiotics, which in Greek means "for life," are products containing *living* microbes that assist with restoring balance between beneficial and pathogenic microflora that live in the intestinal tract. These bacteria protect the gut by interacting in the human immune system to prevent pathogenic bacterial invasion. They are used for the following:

- Diarrhea
- Other suggested preventions or duration reductions: atopic diseases in infants, allergies, common cold, influenza, healthy people with some bowel irregularity.
- **Contraindications:** Probiotic products are not regulated by the FDA. Advise caution in unsupervised use; may interact adversely with prescribed and OTC drugs and supplements; may cause side effects and an allergic response; long-term effects unknown.
- **Other:** Considered generally safe because normally reside in human intestine.

- **Scientific evidence for use:** A true probiotic must contain a predetermined dose of living, active bacteria as shown on the label and must be supported by evidence from valid and reliable clinical trials that show a suggested benefit. Research is ongoing to show effects of probiotic products with colon cancer, other causes of diarrhea or infections in the digestive system, heart disease, other cancers, lipid metabolism, and more.

Equivalents

- 1 centimeter = 0.4 inches
- 1 inch = 2.5 centimeters
- 1 meter = 39.4 inches
- 1 teaspoon = 5 milliliters
- 1 tablespoon = 15 milliliters
- 1 ounce = 30 milliliters
- 8 ounces = 1 cup = 240 milliliters
- 1 quart = 946 milliliters
- 1 grain (gr) = 60 milligrams
- 30 grams = 1 ounce
- 1 gram = 15 grains
- 1000 micrograms = 1 milligram
- 1000 milligrams = 1 gram

Abbreviations

Many healthcare facilities have a specific list of abbreviations that are acceptable. Always check approved abbreviation lists before using.

Abbreviation	Definition
ADC Vaan Dimsl	Mnemonic for admitting orders: A—Admit D—Diagnosis C—Condition V—Vitals A—Activity A—Allergies N—Nursing procedures D—Diet I—In and out recorded M—Medications S—Special Tests (EKG, MRI) L—Laboratory tests

Continued

Abbreviation	Definition
AAA	Abdominal aortic aneurysm
AC	Before eating (Latin – ante cibum)
ACE	Angiotensin-converting enzyme
A&O	Alert and oriented
ADLs	Activites of daily living
AFP	Alpha feta protein
AIDS	Acquired immune deficiency syndrome
ALA	Alpha-linolenic acid
ALT	Alanine aminotransferase
ANA	Antinuclear antibody
AOB	Alcohol on breath
ARBS	Angiotension receptor blockers
ARDS	Adult respiratory distress syndrome
ARF	Acute renal failure
AS	Aortic stenosis
ASCVD	Atherosclerotic cardiovascular disease
ASO	Antistreptolysin O
AST	Aspartate aminotransferase
ATP	Adult treatment panel
BMD	Bone mineral density
BMI	Body Mass Index
BMR	Basal metabolic rate
BP	Blood pressure
BPH	Benign prostatic hypertrophy
BRBPR	Bright red blood per rectum
BX	Biopsy
CAM	Complementary and alternative medicine
CBC	Complete blood count
CBE	Clinical breast exam
CEA	Carcinoembryonic antigen
C&S	Culture and sensitivity
CC	Chief complaint

Continued

Abbreviation	Definition
CCU	Clean catch urine
CHD	Coronary heart disease
CHO	Carbohydrates
CHS	Current health status
COPD	Chronic obstructive pulmonary disorder
CPAP	Continuous positive airway pressure
CPR	Cardiopulmonary resuscitation
CRCL	Creatinine clearance
CRP	C-reactive protein
CT	Computed tomography
CVA	Cerebrovascular accident
CVA	Costovertebral angle
CVAT	Costovertebral angle tenderness
CMV	Cytomegalovirus
CNS	Central nervous system
C&S	Culture and susceptibly
DAT	Diet as tolerated
DAW	Dispense as written
DBP	Diastolic blood pressure
DCBE	Double-contrast barium enema
DDx	Differential diagnosis
DEXA	Dual-energy x-ray absorptiometry
DIC	Disseminated intravascular coagulation
DIP	Distal interphalangeal joint
DKA	Diabetic ketoacidosis
DHA	Docosahexaenoic acid
DNA	Deoxyribonucleic acid
DOE	Dyspnea on exertion
DPT	Diphtheria, pertussis, tetanus
DRE	Digital rectal exam

Continued

Abbreviation	Definition
DTR	Deep tendon reflexes
DVT	Deep vein thrombosis
DX	Diagnosis
EBL	Estimated blood loss
EDD	Estimated date of delivery
EKG	Electrocardiogram
ELISA	Enzyme-linked immunosorbent assay
EMG	Electromyogram
EOM	Extraocular muscles
EPA	Eicosapentaenoic acid
EPO	Exclusive Provider Organization
ESR	Erythrocyte sedimentation rate
ETOH	Alcohol
FBS	Fasting blood glucose
FDA	Food and Drug Administration
FEV	Forced expiratory volume
FH	Family history
FRC	Functional residual capacity
FTA-ABS	Fluorescent treponemal antibody-absorbed (Definitive test for syphilis)
FTT	Failure to thrive
FU	Follow-up
FUO	Fever of unknown origin
FVC	Forced vital capacity
FX	Fracture
G	Gravida
GC	Gonorrhea
GERD	Gastroesophageal reflux disease
GFR	Glomerular filtration rate
GI	Gastrointestinal
gr	Grain
GSW	Gun shot wound

Continued

Abbreviation	Definition
gtt	Drops
GTT	Glucose tolerance test
GU	Genitourinary
GXT	Graded exercise tolerance test (Stress Test)
HA	Headache
HAA	Hepatitis B surface antigen
HAV	Hepatitis A virus
HBc	Hepatitis B core antigen
HBeAg	Hepatitis Be antigen
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HCG	Human chorionic gonadotropin
Hct	Hematocrit
HDL	High-density lipoprotein
HEENT	Head, Ears, Eyes, Nose, Throat
HELLP	Hemolysis, elevated liver enzymes, and low platelet count
Hgb	Hemoglobin
HIV	Human immunodeficiency virus
HMO	Health Maintenance Organization
HO	History of
HJR	Hepatojugular reflex
HLA	Histocompatibility locus antigen
HPI	History of presenting illness
HRCT	High-resolution computed tomography
HSV	Herpes simplex virus
HTN	Hypertension
Hx	History
IC	Interstitial cystitis
ID	Identifying data
ID	Infectious disease
IDDM	Insulin-dependent diabetes mellitus

Continued

Abbreviation	Definition
Ig	Immunoglobulin
IHSS	Idiopathic hypertrophic subaortic stenosis
INR	International normalized ratio
IPA	Independent practice association
ITP	Idiopathic thrombocytopenia purpura
IVC	Intravenous cholangiogram
IVP	Intravenous pyelogram
JVD	Jugular venous distention
JVP	Jugular venous pressure
KUB	Kidney, ureter, and bladder
LAE	Left atrial enlargement
LDL	Low-density lipoprotein
LE	Lupus erythematosus
LIH	Left inguinal hernia
LMP	Last menstrual period
LNMP	Last normal menstrual period
LUQ	Left lower quadrant
MAO	Monoamine (or *monamine*) oxidase
MAOI	Monoamine (or *monamine*) oxidase inhibitors
MCH	Mean corpuscular hemoglobin
MCHC	Mean corpuscular hemoglobin concentration
MCL	Midclavicular line
MCP	Mucopurulent
MCV	Mean corpuscular volume
MI	Myocardial infarction
MLE	Midline episiotomy
MMR	Measles-mumps-rubella
MRI	Magnetic resonance imaging
MRSA	Methicillin-resistant *Staphylococcus aureus*
MS	Multiple sclerosis

Continued

Abbreviation	Definition
NAACP	Mnemonic for neoplasm, allergy, Addison's disease, collagen vascular disease, parasites (all of these cause eosinophilia)
NAD	No apparent distress, or no active disease
NCV	Nerve conduction velocity
NIDDM	Non-insulin-dependent diabetes mellitus
NKA	No known allergies
NSAID	Nonsteroidal anti-inflammatory drug
OA	Osteoarthritis
OAB	Overactive bladder
OCD	Obessive compulsive disorder
OD	Occular dexter (right eye)
OM	Otitis media
OPV	Oral polio vaccine
OS	Occular sinister (left eye)
OTC	Over-the-counter
OU	Both eyes
P	Para
PA	Posteroanterior
PaO_2	Partial pressure of arterial oxygen
PAT	Paroxysmal arterial tachycardia
PC	After eating (post cibum)
PDA	Patent ductus arteriosus
PEEP	Positive end-expiratory pressure
PID	Pelvic inflammatory disease
PERRLADC	Pupils equal, round, reactive to light accommodation directly and consentually
PFT	Pulmonary function test
PKU	Phenylketonuria
PMH	Past medical history
PMI	Point of maximal impulse
PMP	Past menstrual period

Continued

Abbreviation	Definition
PMS	Premenstrual syndrome
PND	Paroxysmal nocturnal dyspnea
PP	Postprandial
PPO	Preferred provider organization
PSA	Prostate specific antigen
PSH	Past health status
PT	Prothrombin time
PTCA	Percutaneous transluminal coronary angioplasty
PTH	Parathyroid hormone
PTT	Partial thromboplastin time
PUD	Peptic ulcer disease
PVD	Peripheral vascular disease
QNS	Quantity not sufficient
RA	Rheumatoid arthritis
RBC	Red blood cells
RDA	Recommended daily allowance
RDW	Red cell distribution width
RFV	Reason for visit
RIA	Radioimmunoassay
RIH	Right inguinal hernia
RLL	Right lower lobe
RLQ	Right lower quadrant
RMCL	Right midclavicular line
RML	Right middle lobe
R/O	Rule out
ROM	Range of motion
ROS	Review of symptoms
RPG	Retrograde pyelogram
RRR	Regular rate and rhythm
RTC	Return to clinic
RUL	Right upper lobe

Continued

Abbreviation	Definition
RUQ	Right upper quadrant
RV	Residual volume
Rx	Treatment
SAB	Miscarriage
SAD	Seasonal affective disorder
SB	Stillbirth
SBE	Subacute bacterial endocarditis
SBP	Systolic blood pressure
SEM	Systolic ejection murmur
SGA	Small for gestational age
SGOT	Serum glutamic oxaloacetic transaminase
SIADH	Syndrome of inappropriate antidiuretic hormone (ADH)
Sig	Write on label (Signa)
SJW	St. John's wort
SL	Sublingual
SLE	Systemic lupus erythematosus
SNAQ	Simplified nutrition assessment questionnaire
SOB	Shortness of breath
SQ	Subcutaneous
SSRI	Selective serotonin reuptake inhibitor
SVD	Spontaneous vaginal delivery
STD	Sexually transmitted disease
STI	Sexually transmitted infection
TAH	Total abdominal hysterectomy
TAH BSO	Total abdominal hysterectomy and bilateral salpingo-oophorectomy
TBLC	Term birth, living child
TCM	Traditional Chinese medicine
Td	Tetanus-diphtheria toxoid
TIA	Transient ischemia attack
TIBC	Total iron-binding capacity

Continued

Abbreviation	Definition
TIg	Tetanus immune globulin
TLC	Therapeutic lifestyle changes
TLC	Total lung capacity
TM	Tympanic membrane
TMJ	Temporomandibular joint
TNTC	Too numerous to count
TOP	Termination of pregnancy
TOPV	Trivalent oral polio vaccine
TORCH	Toxoplasma, rubella, cytomegalovirus, herpesvirus (O = other such as syphilis) (These are all infectious causes of congenital abnormalities.)
TSH	Thyroid stimulating hormone
TVH	Total vaginal hysterectomy
Tw	Twice a week
TX	Treatment
UAO	Upper airway obstruction
Ud	As directed
UFH	Unfractionated heparin
UI	Urinary incontinence
URI	Upper respiratory infection
URQ	Upper right quadrant
VC	Vital capacity
VCT	Venous clotting time
VDRL	Venereal Disease Research Laboratory (test for syphilis)
VMA	Vanillymandelic acid (high levels with pheochromocytoma)
VRE	Vancomycin-resistant enterococci
VSS	Vital signs stable
VV	Varicose veins
VZV	Varicella-zoster virus
WBC	White blood cell

Continued

Abbreviation	Definition
WBR	Whole-body radiation
WD	Well developed
WF	White female
WID	Widow, or widower
WM	White male
WNL	Within normal limits
WOP	Without pain
W-T-D	Wet to dry
W/U	Workup
XL	Extended release
XOM	Extraocular movements
XS	Excessive
XULN	Times upper limits of normal
YOB	Year of birth
YTD	Year-to-date
ZE	Zollinger-Ellison syndrome
Zn	Zinc

Physical Signs and Eponyms

Apgar Score

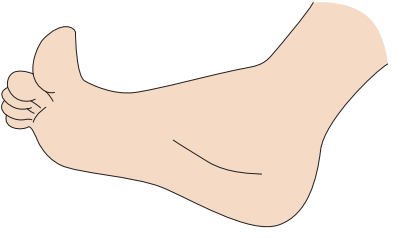
The Apgar score is a system for point score evaluation of the physical condition of a newborn 1 minute after birth. The heart rate, respiration rate, muscle tone, responses to stimuli, and color are each rated 0, 1, or 2. The maximum total score is 10. A score of 7 or less indicates a problem requiring immediate attention if the baby is to survive. The test may be repeated at 5 or more minutes after birth in order to judge recovery of infants with low scores.

- **A:** Appearance (skin color)
  - **0 points:** blue-gray, pale all over
  - **1 point:** normal, except for extremities
  - **2 points:** normal over entire body

- **P:** Pulse
  - **0 points:** absent
  - **1 point:** below 100 bpm
  - **2 points:** above 100 bpm
- **G:** Grimace (reflex irritability)
  - **0 points:** no response
  - **1 point:** grimace
  - **2 points:** sneeze, cough, pulls away
- **A:** Activity (muscle tone)
  - **0 points:** absent
  - **1 point:** arms and legs flexed
  - **2 points:** active movement
- **R:** Respiration
  - **0 points:** absent
  - **1 point:** slow, irregular
  - **2 points:** good, crying

Babinski's Sign

- Extension of the large toe, instead of the normal flexion, with stimulation of the plantar surface of the foot
- Indicative of pyramidal tract disease



Baker Cyst

- Hernia-like cysts in synovial membranes, especially of the knee joints, produced by synovial fluid escaping from a joint through a natural channel or through a hernial opening in the synovial membrane
- Limited extension with mild aching and stiffness of knee
- Occur at any age but more frequent in males 15 to 30 years of age
- Etiology unknown
- Inheritance reported in a family

Barrett's Esophagus

- Condition in which the esophageal lining changes, becoming similar to the tissue that lines the intestine
- A complication of GERD
- More likely to occur in patients who experienced GERD at a young age, had nighttime symptoms, or had complications such as bleeding or stricture (a narrowing due to scarring)

Battle's Sign

- Ecchymosis behind the ear associated with basalar skull fracture

Bence Jones Protein

- Abnormal, heat-sensitive low molecular paraprotein consisting exclusively of monoclonal light chains of gamma globulin molecules.
- Occurring in urine in patients with multiple myeloma and occasionally in patients with other diseases of the reticuloendothelial system
- When urine samples are heated between 50°C to 60°C, a precipitate forms. It disappears when the urine is boiled and reappears when the urine cools.
- Demonstrated by electrophoresis

Boas' Sign

- A tender area left of the 12th thoracic vertebra in patients with gastric ulcer

Bouchard's Nodes

- Hard, nontender, painless nodules on the dorsolateral aspects of the proximal interphalangeal joints
- Associated with osteoarthritis
- Resulting from hypertrophy of the bone

Braxton Hicks Contractions

- Also called contractions insensibiles uteri gravidarum, false labor, and practice contractions
- Painless intermittent uterine contractions that may occur after 3 months of pregnancy in intervals of 10 to 20 minutes
- Not representing true labor pains but are often so interpreted
- Not present in every pregnancy

Brudzinski's Sign

- Flexion of the neck causing the hips to flex in meningitis

Chandelier Sign

- Extreme pain elicited with movement of the cervix during bimanual pelvic examination
- Indicating pelvic inflammatory disease

Chvostek's Sign

- Tapping over the facial nerve causing facial spasm in hypocalcemic states (tetany)

Gilbert's Disease

- One of the most common syndromes known
- A hereditary, congenital, benign, chronic, intermittent hyperbilirubinemia
- Fluctuating jaundice in the absence of any specific symptoms but with an excess of unconjugated bilirubin present in the urine
- Affects both sexes (male to female ratio, 4:1)
- Jaundice detected shortly after birth or later in life
- Scleral jaundice is a constant factor
- Asthenia, fatigue, anxiety, nausea, and abdominal pain occurring in most cases
- Symptoms precipitated by exertion, alcohol, or infection
- Commonly diagnosed by chance investigation
- A familial disorder transmitted as an autosomal dominant trait

Heberden's Nodes

- Hard, nontender, painless nodules on the dorsolateral aspects of the distal interphalangeal joints
- Associated with osteoarthritis and a result of hypertrophy of the bone

Hegar's Sign

- Softening of the distal uterus
- A reliable sign of pregnancy

Homans' Sign

- Calf pain with forcible dorsiflexion of the foot
- Associated with venous thrombosis

Assessing for Homans' sign

Janeway Lesion

- Erythematous or hemorrhagic lesion seen on the palm or sole with subacute bacterial endocarditis

Kernig's Sign

- Inability to completely extend leg when the thigh is flexed at a right angle
- Seen with meningitis

Assessing for Kernig's sign

Kyphosis

- Excessive rounding of the thoracic spinal convexity
- Seen with osteoporosis in older women

Senile kyphosis

Lordosis

- Accentuated normal concavity of the lumbar spine
- Normal in pregnancy

Mallory-Weiss Tear

- A tear in the gastric mucosa where the esophagus meets the stomach that may cause gastric bleeding

McBurney's Point and Sign

- Located one third the distance from the anterior superior iliac spine to the umbilicus on the right
- Tenderness associated with acute appendicitis

McBurney's point

Moro Reflex

- A defensive reflex seen in the first 6 months of life
- In response to a loud noise, passive movement of the child's head or striking the surface on which the infant rests, the infant draws its arms across its chest in an embracing manner
- Absence of this reflex under 6 months of age suggesting diffuse central nervous system damage, and asymmetric responses being seen with all forms of palsies
- Its presence after 6 months of age suggesting cortical disturbance

Murphy's Sign

- Severe pain and inspiratory arrest with palpation of the right upper quadrant
- Associated with cholecystitis

Palpating at right midclavicular line to elicit Murphy's sign

Nabothian Cysts

- Retention cysts formed by the nabothian glands at the neck of the uterus, due to occlusion of the lumina of glands in the mucosa of the uterine cervix, causing them to be distended with retained secretion
- Always benign
- Very common

Obturator Sign

- Flexion and lateral rotation of the thigh eliciting hypogastric pain in cases of inflammation of the obturator inernus
- Positive with pelvic abscess or appendicitis

Obturator muscle test

Oddi Syndrome

- Spasm of the sphincter of Oddi, causing pain and sometimes jaundice, mimicking a gallstone in the common duct

Phalen's Test

- Prolonged maximum flexion of the wrists while opposing the dorsums of each hand against one another
- Pain and tingling in the distribution of the median nerve indicating carpal tunnel syndrome

Psoas Sign

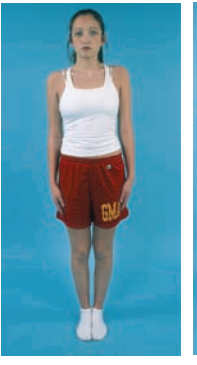
- Pain produced by extension and elevation of the right leg in cases of inflammation of the psoas muscle
- A sign of appendicitis

Reiter's Disease

- A syndrome consisting of urethritis, arthritis, and conjunctivitis in its full-blown picture
- Urethritis usually occurring first
- Polyarthritis, the most dominant of countless clinical symptoms
- Characterized by pain, swelling, redness, and heat in the joints

Romberg's Test

- Used to test position sense or cerebellar function
- Patient standing with heels and toes together, and arms outstretched with palms facing upward
- Normal balance with eyes open and loss of balance with eyes closed indicating loss of position sense



Eyes Open

Eyes Closed

Skene's Glands

- Numerous mucous glands in the wall of the female urethra, localized so that their openings are just inside the urinary meatus
- Almost always infected in acute gonorrhea

Stills Murmur

- Early systolic murmur heard near the left sternal edge in children and young adolescents
- Usually disappearing at puberty

Tinel's Sign

- Radiation of an electric shock sensation in the distal distribution of the median nerve elicited by percussion of the flexor surface of the wrists when fully extended
- Seen in carpal tunnel syndrome

Assessing for Tinel's sign

Trousseau's Sign

- Carpal spasm produced by inflating a blood pressure cuff around the arm to above the level of systolic blood pressure
- Indicating hypocalcemia

Weber-Rinne Test

This combination of tests involves placing a tuning fork on the middle of the skull to determine if the sound lateralizes

Rinne Test

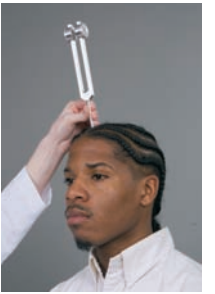
- With the tuning fork held against the mastoid process (bone conduction [BC]) and the opposite ear covered, the patient indicates when the sound is gone.
- The tuning fork is then held next to the ear, and the patient indicates when the sound (air conduction [AC]) disappears.

Performing Rinne Test on mastoid

Performing Rinne test in front of ear

Weber's Test

- With sensorineural hearing loss, the test lateralizes to the less affected ear and AC is greater than BC.
- With conduction hearing loss, the test lateralizes to the more affected ear and BC is greater than AC.



Performing Weber test on head

Performing Weber test on forehead

Zollinger-Ellison Syndrome

- This condition comprises a clinical triad of:
  1. Hypersecretion of gastrin
  2. Multiple, atypically located, often recurrent peptic ulcers
  3. A noninsulin-producing islet cell tumor of the pancreas (about 60% are malignant)
- Affecting males slightly more frequently than females
- Autosomal dominant inheritance
- Known as the multiple endocrine neoplasia I syndrome when associated with familial multiple endocrine adenomatosis

Cranial Nerve Assessment

Nerve	Name	Function	Test
I	Olfactory	Smell	Identify familiar odors (e.g., coffee, peppermint).
II	Optic	Visual acuity	Assess visual acuity using eye chart.
		Visual field	Assess peripheral vision.
III	Oculomotor	Pupillary reaction	Assess pupils for equality and reactivity to light.
IV	Trochlear	Eye movement	Patient follows finger without moving head.
V	Trigeminal	Facial sensation	Touch face and assess for sharp and dull sensation
		Motor function	Have patient hold mouth open
VI	Abducens	Motor function	Patient follows finger without moving head.
VII	Facial	Motor function	Have patient smile, wrinkle face, puff cheeks.
		Sensory	Patient differentiates between sweet and salty taste.
VIII	Acoustic	Hearing	Snap fingers close to the patient's ears.
		Balance	Feet together, arms at side, eyes closed for 5 sec.
IX	Glossopharyngeal	Swallowing and voice	Have patient swallow and then say "AH."
X	Vagus	Gag reflex	Use tongue depressor or swab to elicit gag reflex.
XI	Spinal accessory	Neck motion	Patient shrugs or turns head against resistance.
XII	Hypoglossal	Tongue movement	Patient sticks out tongue and moves it from side to side.

English/Spanish Medical Translations

Anatomy Terms

English Term	Spanish Term
Abdomen	Vientre
Ankle	Tobillo
Arm	Brazo
Back	Espalda
Bladder	La vejiga
Buttocks	Nalgas
Calf	Pantorrilla
Chest	Pecho
Ear	Oreja
Elbow	Codo
Eye	Ojo
Face	Cara
Finger	Dedo de la mano
Foot	Pie
Groin	Ingle
Hair	Cabello
Hand	Mano
Head	Cabeza
Heel	Talon
Hip	Cadera
Knee	Rodilla
Leg	Pierna
Liver	El higado
Mouth	Boca
Neck	Cuello
Nose	Nariz
Rectum	El recto

Continued

English Term	Spanish Term
Shin	Espinilla de la pierna
Shoulder	Hombro
Stomach	El stomacho
Thigh	Muslo
Throat	Garanta
Toe	Dedo del pie
Tongue	La lengua
Vagina	La vagina
Wrist	Muneca

Medical History Questions

English Phrase	Spanish Phrase
What medications do you take?	¿Toma Ud. que medicamentos?
Do you have them with you?	¿Lo trajo con Ud.?
When was your last menstrual period?	¿Cuando la ultimo regla or ultimo periodo menstrual?
Can you point to where the pain is?	¿Puede Ud. senalar con el dedo donde siente el dolor?
Is the pain constant or intermittent?	¿Como lo descriria? ¿Constante o intermitente?
Do you have a cough?	¿Tiene Ud. tos?
Do you cough up sputum?	¿Expectora Ud.?
What color is it?	¿De que color es?
Do you have difficulty swallowing?	¿Tiene Ud. dificultad al tragar?
Do you get dizzy?	¿Tiene Ud. momentos de vertigo?
Do you get headaches?	¿Tiene Ud. dolores de cabeza?
Have you vomited? How often?	¿Vomito Ud.? ¿Con que frecuencia?
Do you have diarrhea? How often?	Tiene Ud. diarrhea? ¿Con que frecuencia?

Continued

English Phrase	Spanish Phrase
Do you get a burning sensation when you urinate?	¿Hay veces que Ud. una sensacion de ardor o dolor cuando orina?
Have you ever been pregnant?	¿Ha estado Ud. embarazada alguna vez?
Have you had a miscarriage or an abortion?	¿Alguna vez ha tenido Ud. un aborto espontance o inducido?
Do you have a vaginal discharge?	¿Tiene Ud. alguana descarga vaginal?
Have you noticed any sores or ulcers?	¿Ha notado Ud. alguna llaga o ulceras?
Do you have pain in your penis, testes, or scrotum?	¿Tiene Ud. color en el pene, los testiculos o el escroto?
How long have you had it?	¿Hace cuanto tiempo que la ha tenido?
Have you ever had an STI?	¿Ha tenido Ud. alguna vez una infirmedad transmitida sexualmente?
Do you have blurred vision?	¿Tiene Ud. vision borrosa?
Do you have a history of high blood pressure or diabetes?	¿Tiene Ud. un historical de presion sanguinea alta o de diabetes?
Are you taking blood thinners?	¿Ud. tomar no densa de sangre?

Electronic Resources

Topic	Web Address
Agency for Healthcare Research and Quality	http://www.ahrq.gov
American Academy of Nurse Practitioners	http://www.aanp.org/AANPCMS2
American College of Nurse Practitioners	http://www.acnpweb.org/i4a/pages/index.cfm?pageid=1
American Diabetes Association	http://www.diabetes.org/home.jsp
American Heart Association	http://www.americanheart.org
American Nurses Association	http://www.nursingworld.org/

Continued

Topic	Web Address
Auscultation Assistant Heart and Lung Sounds	http://www.wilkes.med.ucla.edu/intro.html
Centers for Disease Control Home Page	http://www.cdc.gov/
Clinical Practice Guidelines, UC-San Diego Medical Center	http://health.ucsd.edu/ClinicalResources/ClinRes1.html
Cochrane Evidence Database	http://www.cochrane.org/
Dermatology for Adult Primary Care	http://enotes.tripod.com/14.htm
Dermatology Pictures of Skin Lesions and Diseases	http://www.lib.uiowa.edu/HARDIN/MD/DERMPICTURES.HTML
Family Practice Notebook	http://www.fpnotebook.com/
General Practice On line	http://www.priory.com/gp.htm
JNC 7 Guidelines	http://www.nhlbi.nih.gov/guidelines/hypertension/
Lab Tests Online	http://www.labtestsonline.org/
Medline (Database from the National Library of Medicine)	http://www.nlm.nih.gov/medlineplus/
Medscape	http://www.medscape.com/nurses
MentalHelp.net	http://www.mentalhelp.net/
National Guideline Clearinghouse	http://www.guidelines.gov
National Heart Lung and Blood Institute Cholesterol Guidelines	http://www.nhlbi.nih.gov/guidelines/cholesterol/
National Institutes of Health	http://www.nih.gov
NP Central	http://www.npcentral.net/siteinfo/
The Nurse Practitioner's Place	http://www.arnp.blogspot.com/
Office of Disease Prevention and Health Promotion	http://odphp.osophs.dhhs.gov/
PubMed (Database)	http://www.ncbi.nlm.nih.gov/pubmed/
World Health Organization Health Promotion Web site	http://www.who.int/topics/health_promotion/en/

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The "Common Symbols Used to Develop Genetic Pedigrees" and "Pedigree Line Definitions" figures in Tab 1: Screening are from Bennett RL, Steinhaus KA, Uhrich SB, et al. Recommendations for standardized human pedigree nomenclature. *American Journal of Human Genetics*. 1995;56:745-752.

The "Dermatomes" figure in Tab 2: Assessment is from Myers E, Hopkins T. *LPN Notes,* 2nd ed. Philadelphia: F.A. Davis Company; 2007.

The "Food Guide Pyramid" in Tab 2: Assessment is from the USDA's Web site at MyPyramid.gov

With the exception of the first figure, all figures in Tab 8: Tools are from Dillon PM. *Nursing Health Assessment: A Critical Thinking, Case Studies Approach*, 2nd ed. Philadelphia: F.A. Davis Company; 2007.

Index

Notes