NUR 601 Study Guide midterm 1

Primary Care of the Maturing and Aged Family Practicum (Chamberlain University)

NR 601 Midterm Exam Study

Guide Weeks 1-4 content

Week 1: Reading: Complete

Dunphy, L.M., Winland-Brown, J. E., Porter, B.O. & Thomas, D.J. (2019). Primary Care-The art and science of Advanced Practice Nursing-An interprofessional approach. (5th ed.) Philadelphia: F.A. Davis Company.

- Ch.77 Primary Care of Older Adults p. 1281-1292; (WO 1.1-1.3)
- Ch.77: Medications in the Elderly p.1292-1293; (WO 1.5)

Kennedy-Malone, L., Plank, L. M., & Duffy, E. G. (2019). Advanced practice nursing in the care of older adults (2nd ed.). Philadelphia: F.A. Davis Company.

- Chapter 1: Changes with Aging (p.2-4); (WO 1.1-1.3)
- Chapter 2: Health Promotion (p.6-18); (WO 1.2)
- Chapter 3: Exercise in Older Adults (p.19-22); (WO 1.1-1.3)
- Chapter 4: Comprehensive Geriatric Assessment (p.26-33); (WO 1.4)
- Chapter 17: Polypharmacy (p.470-473); (WO2.3)

Lessons: Complete
Videos: Complete
DE: Complete (if applicable)

Week 2: Readings: Complete

Dunphy, L.M., Winland-Brown, J. E., Porter, B.O. & Thomas, D.J. (2019). Primary Care-The art and science of Advanced Practice Nursing-An interprofessional approach. (5th ed.) Philadelphia: F.A. Davis Company.

- Chapter 28: Common Respiratory Complaints (p.357-361); (WO2.1-2.3)
- Chapter 29: Sleep apnea (p. 363-370); (WO2.4)
- Chapter 30: Pneumonia (p.375-384); (WO2.1)
- Chapter 31:(397-423); (WO 2.1-2.4)

Kennedy-Malone, L., Plank, L. M., & Duffy, E. G. (2019). Advanced practice nursing in the care of older adults (2nd ed.). Philadelphia: F.A. Davis Company.

- Chapter 8: Chest Disorders; (WO2.1)
- Assessment of the respiratory system (p.154); (WO 2.1)
- Chronic obstructive pulmonary disease (p.164-170); (WO2.1-2.2)
- Pneumonia (p.191-196); (WO2.1-2.2)

Lessons: Complete
Videos: Complete
DE: Complete (if applicable)

Week 3: Readings: Complete

Dunphy, L.M., Winland-Brown, J. E., Porter, B.O. & Thomas, D.J. (2019). Primary Care-The art and science of Advanced Practice Nursing-An interprofessional approach. (5th ed.) Philadelphia: F.A. Davis Company.

- Chapter 70: Sleep Wake Disorders: Insomnia (p.1167-1173) (WO3.3)
- Chapter 64: Overview, Stress & Anxiety and Depressed Mood (p. 1055-1058) (WO3.1, 3.2)
- Chapter 67: Major Depressive disorder (p.1100-1110) (WO3.1, 3.2)
- Chapter 68: Generalized anxiety disorder (p. 1129-1135) (WO3.1-3.2)

Kennedy-Malone, L., Plank, L. M., & Duffy, E. G. (2019). Advanced practice nursing in the care of older adults (2nd ed.). Philadelphia: F.A. Davis Company.

- Anxiety (p.434-436) (WO3.1-3.2)
- Bipolar disorder (p.436-438) (WO3.1-3.2)
- Depression (p.451-456) (WO3.1-3.2)
- Insomnia (p.461-462) (WO3.3)
- Grief and Bereavement (p.459-460) (WO3.5)
- Prescription drug misuse (p.436-465) (WO3.4)

Lessons: Complete
Videos: Complete
Week 4: Readings: Complete
DE: Complete (if applicable)

Kennedy-Malone, L., Plank, L. M., & Duffy, E. G. (2019). Advanced practice nursing in the care of older adults (2nd ed.). Philadelphia: F.A. Davis Company.

- Osteoarthritis and Osteoporosis (p.851-870); (WO 4.1-4.3)

Kennedy-Malone, L., Plank, L. M., & Duffy, E. G. (2019). Advanced practice nursing in the care of older adults (2nd ed.). Philadelphia: F.A. Davis Company.

- Osteoarthritis (p.315-319); (WO 4.1-4.2)
- Rheumatoid arthritis (p.322-325); (WO4.2)

Lessons: Complete
Videos: Complete
DE: Complete (if applicable)

Week	Topics
1	• **Developmental changes**

Review Kennedy and Dunphy readings for age related changes

Replicative senescence is theory states that cells can replicate or divide a specific number of times. This ability tends to decrease with age.

Oxidative damage is the cumulative result of the aerobic metabolism, which generates chemicals called free radicals. Free radicals may interact with other chemicals in the body and cause damage to cells.

Telomere shortening is a theory that links aging to a reduction in cell division.

Weakening of the immune response leaves older adults more vulnerable to infection and debilitating diseases.

- **Physiological**

Age related Change	**Functional Change**	**Implications**
Integumentary System		
Loss of dermal and epidermal thickness	Loss of subcutaneous tissue and thin epidermis.	Prone to skin breakdown and injury
Decreased vascularity	• Atrophy of sweat glands resulting in decreased sweat production • Decreased body odor • Decreased heat loss • Dryness	• Alteration in thermoregulatory response • Fluid requirements may change seasonally • Loss of skin water • Increased risk of heat stroke
Respiratory System		
Decreased lung tissue elasticity	Decreased vital capacity	Reduced overall efficiency of ventilatory exchange
Cilia atrophy	Change in mucociliary transport	Increased susceptibility to infection
Decreased respiratory muscle strength	• Reduced ability to handle secretions and reduced effectiveness against noxious foreign particles • Partial inflation of lungs at rest	Increased risk of atelectasis

Cardiovascular System		
Heart valves thicken and become fibrotic	Reduced stroke volume, cardiac output; may be altered	Decreased responsiveness to stress
Fibroelastic thickening of the sinoatrial node; decreased number of pacemaker cells	Slower heart rate	Increased prevalence of arrhythmias
Decreased baroreceptor sensitivity (stretch receptors)	Decreased sensitivity to changes in blood pressure	Prone to loss of balance, which increases the risk for falls
GI		
Liver becomes smaller	Decreased storage capacity	
Decreased muscle tone	Altered motility	Increases risk of constipation, functional bowel syndrome, esophageal spasm, diverticular disease
Decreased basal metabolic rate (rate at which fuel is converted into energy)		May need fewer calories

- **Lab results- Dunphy Table 77.2**

Lab Test	Normal	Changes with age	Comments
UA			
Protein	0-5mg/100ml	Rises slightly	May be due to kidney changes with age, urinary tract infection, renal pathology
Specific Gravity	1.005-1.020	Lower max in elderly 1.016-1.022	Decline in nephrons impairs ability to concentrate urine

Hematology			
ESR	Men: 0-20 Women: 0-30	Significant increase	Neither sensitive nor specific in aged
Iron Binding	50-160mcg/dl 230-410mcg/dl	Slight decrease Decrease	
Hemoglobin	Men: 13-18g/100ml Women: 12-16g	Men: 10-17g Women: None noted	Anemia common in the elderly
Hematocrit	Men: 45-52% Women 37-48%	Slight decreased speculated	Decline in hematopoiesis
Leukocytes	4,300–10,800/mm3	Drop to 3,100–9,000/mm3	Decrease may be due to drugs or sepsis and should not be attributed immediately to age
Lymphocytes	00–2,400 T cells/mm3 50–200 B cells/mm3	T-cell and B-cell levels fall	Infection risk higher; immunization encouraged
Platelet	150,000–350,000/	No change in number	
Blood Chemistry			
Albumin	3.5–5.0	Decline	Related to decrease in liver size and enzymes; protein-energy malnutrition common
Globulin	2.3–3.5	Slight increase	
Total seru			es may indicate

protein			malnutrition, infection, liver disease
Blood urea nitrogen	Men: 10–25 Women: 8–20 mg	**Increases significantly up to 69 mg**	Increases significantly up to 69 mg
Creatinine	0.6–1.5 mg	Increases to 1.9 mg	Related to lean body mass decrease
Creatinine clearance	104–124 mL/min	**Decreases 10%/decade after age 40 years**	Used for prescribing medications for drugs excreted by kidney
Glucose tolerance	62–110 mg/dL after fasting; >120 mg/dL after 2 hours postprandial	Slight increase of 10 mg/dL/decade after 30 years of age	Diabetes increasingly prevalent; drugs may cause glucose intolerance
Alkaline phosphatase	13–39 IU/L	Increase by 8–10 IU/L	Elevations >20% usually due to disease; elevations may be found with bone abnormalities, drugs (e.g., narcotics), and eating a fatty meal

- **Atypical disease presentations**

Erroneously associating aging with disease, disuse, and disability, older adults perceive this change as inevitable and either fail to present to the health-care provider or, if they do, fail to challenge the assumption that this represents normal aging. At times an acute symptom such as pain or dyspnea is superimposed on a chronic symptom, and the older adult may not recognize that it represents a new or exacerbated pathology

TABLE 1-1 Presentation of Illness in Older Adults

ILLNESS	ATYPICAL PRESENTATIONS
Acute abdomen	Absence of symptoms or vague symptoms Acute confusion Mild discomfort and constipation Some tachypnea and possibly vague respiratory symptoms Appendicitis pain may begin in right lower

	quadrant and become diffuse
Depression	Anorexia, vague abdominal complaints, new onset of constipation, insomnia, hyp lack of sadness
Hyperthyroidism	Hyperthyroidism presenting as "apathetic thyrotoxicosis," i.e., fatigue and weakn weight loss may result instead of weight gain; patients report palpitations, tachyca onset of atrial fibrillation, and heart failure may occur with undiagnosed hyperthy
Hypothyroidism	Hypothyroidism often presents with **confusion and agitation**; new onset of anore **weight loss**, and arthralgias may occur
Malignancy	New or worsening back pain secondary to metastases from slow growing breast n Silent masses of the bowel
Myocardial	Absence of chest pain
infarction (MI)	Vague symptoms of fatigue, nausea, and a decrease in functional and cognitive sta classic presentations: dyspnea, epigastric discomfort, weakness, vomiting; history
	previous cardiac failure
	Higher prevalence in females versus males Non-Q-wave MI
Overall infectious diseases process	Absence of fever or low-grade fever Malaise
	Sepsis without usual leukocytosis and fever Falls, anorexia, new onset of confusio alteration in change in mental status, decrease in usual functional status
Peptic ulcer disease	Absence of abdominal pain, dyspepsia, early satiety Painless, bloodless
	New onset of confusion, unexplained
	tachycardia, and/or hypotension
Pneumonia	Absence of fever; mild coughing without copious sputum, especially in dehydrate patients; tachycardia and tachypnea; anorexia and malaise are common; alteration cognition.
Pulmonary edema	Lack of paroxysmal nocturnal dyspnea or coughing; insidious onset with changes function, food or fluid intake, or confusion
Tuberculosis (TB)	Atypical signs of TB in older adults include hepatosplenomegaly, abnormalities in function tests, and anemia
Urinary tract infection	Absence of fever, worsening mental or functional status, dizziness, anorexia, fatig weakness

- **Geriatric syndromes**

Complicating the care of older adults is when patients develop geriatric syndromes that often involve multiple body systems and have more than one underlying cause. For patients presenting with one or more of new geriatric giants: frailty, anorexia of aging, sarcopenia, and cognitive impairment, the risk escalates for falls, delirium, injuries, and depression, subsequently placing these patients at dangers for iatrogenic events that could lead to hospitalization, institutionalization, and subsequently, death.

- **Categories of aging, know age ranges for old, young old, old-old, etc.**

TABLE 1- **s Older Adults**

TYPE OF CONDITION	YOUNGER ADULTS	OLDER ADULTS
Dermatological Psoriasis	Late teens to 20s Irregular course which tends to generalize Hereditary factors	50s—males 60s—females Sporadic onset
Gastrointestinal Inflammatory bowel disease Ulcerative colitis (UC) Crohn's disease (CD)	20–40 years old Right lower UC Insidious onset	>60–75 years old a secon occurs More often older women Proctitis Left-sided UC Higher rates of anemia May present as chronic d Fistula development Increased cases of associ malnutrition Extraintestinal manifesta including: arthritis spond uveitis, and erythema no More comorbid condition May be confused with ot of colitis
Malignancies Hodgkin's lymphoma	20–30 years old Possible infectious etiology	>50 years old Increased mortality
Neurodegenerative Myasthenia gravis (MG)	Women 20–40 years old More thymus abnormalities	Men—50–70 years old Women—70 years old Dysphonia More frequent ocular for Increased rate of AChR seropositivity

Exercise in older adults (Kennedy)

- Recommended exercises for sleep and flexibility

⇒ Exercise recommendations for specific diagnoses (Kennedy)

Osteoarthritis

Walking, aquatic activities, tai chi, resistance exercises, cycling

Vary type and intensity to avoid overstressing joints; heated pool

Coronary artery disease

Walking, treadmill walking, cycle ergometry

Supervised program with BP and heart rate monitoring

Congestive heart failure

	Walking, treadmill walking, cycle ergometry Individualize to client; supervised program **Type 2 diabetes mellitus** Resistive, aerobic, aquatic, recreational activities Proper shoe fit; may need insulin reduction if insulin dependent **Anxiety disorders** Walking, biking, weight lifting If able to do high-intensity exercise, this benefits anxiety **Depression** Walking, cycling, recreational activities Group participation helpful to keep patient engaged **Fibromyalgia** Aerobic, aquatic therapy, strengthening, tai chi, Pilates Heated pool, gentle stretches, counsel about possible increased pain initially **Chronic obstructive pulmonary disease** Cycle ergometer, treadmill walking; individualize Supervised program—consider pulmonary rehabilitation program **Chronic venous insufficiency** Walking, standing exercises Supervised program **Osteoporosis** Weight-bearing exercises, weight training Assess balance and risk for falls before beginning **Parkinson's disease** Walking, treadmill walking, stationary bike, dancing, tai chi, Pilates, boxing Assess balance and risk for falls before beginning; American Parkinson's Disease Association resources

Peripheral arterial disease

Lower extremity exercises, treadmill walking, walking

Very short intervals initially, progress as tolerated

Age-related sleep disorders

Tai chi, walking, aquatherapy, biking

Assess balance and risk for falls before beginning

Dementia

Walking, recreational activities

Provide safe environment, assess fall risk and ability to participate.

⇒ Testing prior to exercise initiation

⇒ Recommended testing prior to exercise initiation

⇒ **Barriers, facilitators and contraindications to exercise**

Barriers

- Lack of time
- Perceived need for equipment
- Perceived barrier to beginning exercise/physical activity
- Disability or functional limitation
- Unsafe neighborhood or weather conditions
- No parks or walking trails
- Depression
- High body mass index (BMI)
- Lack of motivation
- Interpersonal loss or significant life event
- Ignorance of what to do

Patient Facilitators

- Social support
- Positive self-efficacy
- Motivation to engage in physical activity
- Good health, no functional limitations
- Frequent contact with prescriber
- Regular schedule, planned program
- Satisfaction with program
- Insurance incentive
- Improvement in mobility or health condition
- Staff

Contraindications

- Unstable angina
- Uncompensated heart failure
- Severe anemia
- Uncontrolled blood glucose
- Unstable aortic aneurysm
- Uncontrolled hypertension or tachycardia
- Severe dehydration or heat stroke
- Low oxygen saturation

⇒ **Health promotion (Dunphy and Kennedy)**

⇒ **Immunizations**

Influenza vaccine is now recommended annually for all adults over 50 years old, unless contraindicated (Table 2-1). Residents of long-term care facilities that house persons with chronic medical conditions are at especially high risk for developing the disease. Health-care workers also should receive the vaccine, preferably before the **end of October** (Resnick, 2018). Patients with a **severe egg allergy** or severe reaction to the influenza vaccine in the past and patients with a prior history of Guillain-Barré syndrome should talk with their health-care provider before getting the vaccine.

Tetanus-diphtheria toxoids with acellular pertussis (Tdap) vaccine is administered as a once-in-a-lifetime booster to every adult. Following this, a tetanus-diphtheria (Td) booster is recommended every **10 years**.

Pneumococcal vaccine is recommended as follows: Administer a one-time dose to PCV13-naïve adults at age 65 years, followed by a dose of PPSV23 12 months later.

Hepatitis B vaccine is recommended for high-risk persons such as IV drug users, persons who are sexually active with multiple partners, those living with someone with chronic hepatitis B, patients less than 60 years old with diabetes, and all desiring protection from hepatitis B. The initial dose is given, followed 1 month later by the second dose, then the third dose is given 4 to 6 months after the second dose.

Shingrix is a new vaccine for zoster and is recommended over Zostavax. It is administered in two doses. The second dose can be given from 2 to 6 months after the initial one. Persons who have had Zostavax should now be immunized with Shingrix. Those who have had a prior episode of zoster should be vaccinated (CDC, Adult Immunization Schedule)

⇒ Recommended health screenings- age ranges and frequency (Kennedy p.9-11)

⇒ **Travel (Kennedy)**

Risks related to travel: Patients with chronic disease that is well managed at home may decompensate in foreign environments because of heat, humidity, altitude, fatigue, changes in diet, and exposure to infectious diseases.Fever is not always a reliable indicator of illness in the older adult. Seroconversion rates decrease with age, rendering some vaccines less effective for older travelers.

Immuniza za, pneumococcal, Td/Tdap (tetanus, d is B vaccination. **Yellow**

fever and herpes zoster vaccine are the only live virus vaccines that people over age 50 receive. Immune response can be impaired if live virus vaccines are given within a 28- to 30-day interval of each other. Yellow fever vaccine is not effective until 10 days after administration. If the NP gives a patient a herpes zoster vaccine, that patient cannot receive a yellow fever vaccine for 30 days. If the patient is required to have a yellow fever vaccine for travel, he or she cannot enter a yellow fever country until 10 days after receiving the yellow fever vaccine. If a patient receives a yellow fever vaccine, he or she cannot receive a herpes zoster vaccine for 28 days. The patient may receive both vaccines on the same day with no decrease in immune response

The most common vaccines used for protecting travelers are hepatitis A, hepatitis B, typhoid fever, yellow fever, adult booster polio, Japanese encephalitis, meningococcal, and rabies.

- ⇒ **Comprehensive Geriatric Assessment (Kennedy)**
- ⇒ **Purpose of the CGA**
- ⇒ **Domains- identify all 4**
- ⇒ **Screening tools associated with each domain**

DOMAINS OF COMPREHENSIVE GERIATRIC ASSESSMENT	DIMENSIONS OF COMPREHENSIVE GERIATRIC ASSESSMENT
Physical health **chief complaint, history of present illness, past history, family and social history, and a review of systems),**	History taking Physical examination Diagnostics Nutritional assessment Medication review
Functional health **the Katz Activities of Daily Living Scale**	Activities of daily living Instrumental activities of daily living Sensory assessment (hearing, vision) Gait and balance
Psychological health **MMSE: the Mini-Cog, Montreal Cognitive Assessment (MoCA), and Saint Louis University Mental Status Examination (SLUMS)**	Cognitive disorders (delirium, dementia, mild cognitive impairment) Affective disorders (depression, anxiety) Spiritual well-being
Socioenvironmental **The Medical Outcomes Study—Short-Form 36**	Social network and support

	Supports **Lubben Social Network Scale**	Living situation Environmental safety Economic resources
	Quality of life measures **The Medical Outcomes Study—Short-Form 36**	Physical conditions Social conditions Environmental conditions Personal resources (mental health, life perspective) Preferences for care

⇒ **Beers Criteria (article)**

Purpose

- Guide to use for medical management of geriatric patient's
- List of potentially inappropriate medications for the elderly-listed by drug category and diagnosis
- Lists alternative drugs that can be used safely in older adults
- Drug to drug interactions listed, dosage for kidney impairment graded as high, medium, or low to assist with decision making.

⇒ **Polypharmacy (Kennedy)**

Multiple definitions (review discussion)

- Prescribing many drugs, prescribing 5 or more drugs, or prescribing potentially inappropriate medications.
- The use of multiple pharmacies (providers & self-prescribers)
- Providers should routinely evaluate medication appropriateness to avoid the risk of polypharmacy

Prevention strategies

- Have new patients bring in all medications to their first visit
- Review med list at every visit
- Ask if any other provider has changed or added any meds
- Update med list at every visit

Screening tools

- Three available tools to evaluate patient's prescriptions
  - STOPP (screening tool of older persons' potentially inappropriate prescriptions
  - MAI (Medication Appropriateness Index)
  - ARMOR (Assess, Review, Minimize, Optimize, Reassess)

2	COPD (Dunphy and Kennedy) o **S**

	Dyspnea, chronic cough with or without sputum production, decreased activity tolerance, wheezing. Dyspnea, chronic cough with or without sputum production, recurrent lower respiratory infections, wheezing, chest tightness, fatigue, weight loss, and/or anorexia. increased anteroposterior diameter of the thorax, use of accessory muscles for respiration, prolonged expiration, hyperresonance on percussion, decreased heart and breath sounds, tachypnea, neck vein distention during expiration in absence of heart failure, ruddy or cyanotic skin color, and clubbing of nail beds o Diagnostic criteria o Management o Management of exacerbations (Kennedy)

⇒ **Asthma (Dunphy)**

⇒ **Signs and symptoms**

recurrent wheezing, cough (especially at night), recurrent chest tightness, shortness of breath

⇒ **Diagnostic criteria:** FEV 1 /FVC ratio before and after bronchodilator challenge, showing an improvement of 12% and 200 mL, indicates reversible airway obstruction; If spirometry is near normal, bronchoprovocation such as a methacholine challenge test may help to differentiate other conditions with a similar presentation

⇒ **Severity classifications**

Intermittent: < 2 days/w ; nighttime awakenings: ≤2x/month

Persistent:

Mild: 2 days/week but not daily; nighttime awakenings: 3–4x/month

Moderate: daily; nighttime awakenings: 1x/week but not nightly

Severe: Throughout the day; nighttime awakenings: often 7x/week

⇒ Medications for each severity class (Dunphy p. 401)

Interstitial Lung Disease (Dunphy)

⇒ **Types:** ILD comprises a heterogeneous group of diseases that cause inflammation and fibrosis of the lower respiratory tract. Four infections may be associated with the cause or onset of most of the various diseases:

⇒ disseminated fungus (coccidioidomycosis, blastomycosis, histoplasmosis),

⇒ disseminated mycobacteria

⇒ Pneumocystis pneumonia,

⇒ and certain viruses

The largest group:

Ø occupational and environmental inhalant diseases; these include diseases resulting from inhalation of inorganic dusts, organic dusts, gases, fumes, vapors, and aerosols.

Ø Other categories include ILDs caused by drugs, irradiation, poisons, neoplasia, and chronic cardiac failure.

Ø unknown causes are idiopathic pulmonary fibrosis (IPF) and connective tissue (collagen vascular) disorders with ILD, including rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), progressive systemic sclerosis, polymyositis-dermatomyositis, and Sjögren's syndrome.

Seven major entities that are most frequently associated with diffuse ILD are

(1) IPF,

(2) bronchiolitis obliterans organizing pneumonia,

(3) connective tissue (collagen vascular) diseases (SLE, RA, progressive systemic sclerosis [scleroderma], and polymyositis-dermatomyositis),

(4)systemic granulomatous vasculitis's (Wegener's granulomatosis, lymphomatoid granulomatosis, and allergic angitis and granulomatosis),

(5) drug-induced pulmonary disease,

(6) sarcoidosis, and

(7) hypersensitivity pneumonitis.

⇒ **Xray findings in ILD**

Abnormalities **on chest x-ray** may be the first clue to the presence of ILD; however, the patient with ILD may be asymptomatic or symptomatic with either normal or abnormal chest x-ray results. The initial abnormality on the **chest x-ray film is usually described as a ground glass, A scattered reticulonodular pattern or hazy appearance of the lungs**

Community Acquired Pneumonia (CAP) (Dunphy)

⇒ **Signs and symptoms:** Typical symptoms include fever, chills, cough, and rusty or thick sputum, with associated gastrointestinal upset or anorexia, malaise, and diaphoresis; pleuritic chest pain may also be present, crackles. Older patient - mental status changes, falls, inc. resp. rate, hypotension, anorexia, new onset of urinary incontinence.

⇒ **Diagnostic criteria:** CURB -65 (each criteria worth 1 pt)

C - Confusion

U - BUN >19 ng/dL

R - Respiratory rate ≥ 30 breaths/min

B - BP: Systolic <90 mm Hg OR Diastolic <60 mm Hg

⇒ **Radiographic findings:** chest x-ray is considered the gold standard for the diagnosis of pneumonia; C-reactive protein (CRP) and/or urine specific antigen when there is a question about when, or if, to start antibiotic therapy ; CT scan of the chest is often ordered and is more accurate than a chest x-ray; Pulmonary infiltrate, lobular consolidation, or opacities found on chest x-ray, CT scan, or ultrasound confirm the diagnosis of pneumonia.

⇒ **Treatment standards (Dunphy p. 383):** Antimicrobial therapy represents the mainstay of treatment for patients with suspected or confirmed pneumonia. Additional management is

supportive and includes the use of analgesics for relief of chest pain and myalgia, antipyretics to control fever, increased fluid intake (typically at least 3 L over 24 hours), restricted activity or bedrest, a position of comfort (usually upright) to facilitate breathing, and humidified air to relieve irritated nares and pharynx. Expectorants may be indicated to decrease sputum viscosity and clear airways if a productive cough is present.

Treatment Standards/Guidelines: Empiric Antimicrobial Choices for Community-Acquired Pneumonia (CAP)

PATIENT PROFILE	ANTIMICROBIAL AGENT
Uncomplicated CAP	
Without recent antibiotic therapy (ATBX)*	**Azithromycin (Zithromax)** or clarithromycin (Biaxin) or doxycycline (Vibramycin)
With recent ATBX‡	Respiratory fluoroquinolone moxifloxacin (Avelox) or levofloxacin (Levaquin) OR Azithromycin or clarithromycin PLUS High-dose amoxicillin (Amoxil) OR **Azithromycin or clarithromycin PLUS High-dose amoxicillin–clavulanate (Augmentin)**

Patient with CAP plus comorbidities: alcoholism; diabetes mellitus; lung/liver/renal diseases	Respiratory fluoroquinolone OR Beta-lactam IV/intramuscular **ceftriaxone (Rocephin)** or Cefuroxime (Ceftin) PLUS Macrolide
Patient with community-acquired methicillin-resistant *S. aureus* pneumonia	Vancomycin (Vancocin) OR Linezolid (Zyvox)

⇒ **Scoring**

0-1: Low risk; consider outpatient treatment

2: Brief hospitalization or closely monitored outpatient treatment

≥ 3: Severe, hospitalize and possible ICU

Obstructive & Restrictive Airway Disease (Kahn Academy video and Dunphy

⇒ **Understand the PFT interpretation for both (Kahn Academy video):** https://www.alphanetbfrg.org/pdfs/Understanding-PFT.pdf

⇒ **PFT**: Normal FEV 1 /FVC ratio but decreased FVC and FEV 1 ; decreased total lung capacity, residual volume, and functional residual capacity. Residual volume–to–total lung capacity ratio is normal to low.

⇒ **Know which airway diseases are reversible and irreversible:** FEV 1 /FVC ratio before and after bronchodilator challenge, showing an improvement of 12% and 200 mL, indicates **reversible** airway obstruction

⇒ **Obstructive pattern:** An FEV_1/FVC <70/80% suggests obstructive lung disease.

- Decreased FEV_1, normal or decreased FVC, and decreased FEV_1/FVC
- **Classically, these are the patients with asthma, chronic bronchitis, or emphysema**
  - PFTs can help further distinguish between the above three:
    - Bronchodilator responsiveness - an increase in the FEV_1 by 12% following bronchodilator use suggests asthma
    - Bronchial provocation - inducing asthmatic obstruction of reactive lower

airways by administering methacholine, histamine, or adenosine monophosphate
        - DL_{CO} will be decreased in patients with emphysema, and can be normal or increased in patients with asthma
    - **Lower airway obstruction vs. upper airway obstruction**
        - Lower airway obstruction typically displays impaired expiratory capacity (see image below), while upper airway obstruction has impaired inspiratory capacity, which can be evident on the flow volume loop (seen as flattening of the inspiratory arm).

⇒ **Restrictive pattern** restrictive lung disease typically has normal or increased FEV_1/FVC
- Decreased TLC, FEV_1, and FVC with a normal FEV_1/FVC, and a low DL_{CO}
- Typically these are patients with interstitial lung disease, severe skeletal abnormalities, or diaphragmatic paralysis
- The flow volume loop is generally normal in appearance, but has low lung volumes

Spirometry (Kahn Academy video and readings)

⇒ **Know definitions for each spirometry criteria:** Spirometry measures two key factors: expiratory forced vital capacity (FVC) and forced expiratory volume in one second (FEV1). Your doctor also looks at these as a combined number known as the FEV1/FVC ratio. If you have obstructed airways, the amount of air you're able to quickly blow out of your lungs will be reduced. This translates to a lower FEV1 and FEV1/FVC ratio. Forced vital capacity (FVC). This is the largest amount of air that you can forcefully exhale after breathing in as deeply as you can. A lower than normal FVC reading indicates restricted breathing. Forced expiratory volume (FEV). This is how much air you can force from your lungs in one second. This reading helps your doctor assess the severity of your breathing problems. Lower FEV-1 readings indicate more significant obstruction.

Spirometry

⇒ PFTs can be used in a variety of settings, and they are generally ordered to:
- Look for evidence of respiratory disease when patients present with respiratory symptoms (e.g. dyspnea, cough, cyanosis, wheezing, etc.);
- Assess for any progression of lung disease;
- Monitor the efficacy of a given treatment;
- Evaluate patients pre-operatively; and
- Monitor for potentially toxic side effects of certain drugs (e.g. amiodarone)

⇒ The components of PFTs include:
- Lung volumes
- Spirometry and flow volume loops
- Diffusing capacity

⇒ **Know criteria to determine severity (FEV1)**

Figure 1. GOLD SPIROMETRIC CRITERIA FOR COPD SEVERITY[1]

I: Mild COPD	• $FEV_1/FVC < 0.7$ • $FEV_1 \geq 80\%$ predicted	At this stage, the patient may not be aware that their lung function is abnormal.
II: Moderate COPD	• $FEV_1/FVC < 0.7$ • $50\% \leq FEV_1 < 80\%$ predicted	Symptoms usually progress at this stage, with shortness of breath typically developing on exertion.
III: Severe COPD	• $FEV_1/FVC < 0.7$ • $30\% \leq FEV_1 < 50\%$ predicted	Shortness of breath typically worsens at this stage and often limits patients' daily activities. Exacerbations are especially seen beginning at this stage.
IV: Very Severe COPD	• $FEV_1/FVC < 0.7$ • $FEV_1 < 30\%$ predicted *or* $FEV_1 < 50\%$ predicted plus chronic respiratory failure	At this stage, quality of life is very appreciably impaired and exacerbations may be life-threatening.

https://goldcopd.org/wp-content/uploads/2018/11/GOLD-2019-POCKET-GUIDE-DRAFT-v1.7-14Nov2018-WMS.pdf

⇒ **Know criteria for diagnosis of obstruction (FEV1/FVC ratio**
FEV1/FVC ratio (<70%)

⇒ **Stage 1**: Very mild COPD with a FEV1 about 80 percent or more of normal.
⇒ **Stage 2**: Moderate COPD with a FEV1 between 50 and 80 percent of normal.
⇒ **Stage 3**: Severe emphysema with FEV1 between 30 and 50 percent of normal.
⇒ **Stage 4**: Very severe COPD with a lower FEV1 than Stage 3, or those with Stage 3 FEV1 *and* low blood oxygen levels

⇒ Know criteria for diagnosis of reversible vs irreversible Sleep apnea

(Dunphy)

⇒ **Diagnostic criteria (includes risk factors) *Sleep apnea*** is defined as a temporary pause in breathing during sleep that lasts at least 10 seconds. For a confirmed diagnosis, this should occur a minimum of five times an hour. The predominant physical examination findings of OSA reflect the risk factors: obesity (particularly of the upper body), increased neck size, crowded oropharynx (tonsillar hypertrophy and enlargement of soft palate [uvula] and tongue).

⇒ **Signs and symptoms & Hypersomnolence signs and symptoms**: Hypersomnolence is the single most important presenting symptom of sleep apnea. Daytime symptoms include a morning headache (from hypercapnia) and neuropsychological disturbances, including falling asleep while performing purposeful activities. The patient may complain of nocturnal restlessness, frequent urination or enuresis, and choking. Patients also may report impaired intellectual performance, such as decreased concentration, ambition, and memory loss.

3 Mood disorders	**Anxiety** ⇒ **Signs and symptoms, prevalence, risk factors:** Excessive worrying that is difficult to control and interferes with daily life; can also manifest with somatic symptoms such as chest tightness, shortness of breath, upset stomach. Predictors of late-onset anxiety include female gender, recent adverse life events, illness, cognitive impairment, and mental illness comorbidities, while poverty and poor psychological support during earlier years also contribute (Zhang et al., 2015). Comorbid dementia or depression are not uncommon in older patients experiencing anxiety Signs and Symptoms: May include a sense of impending doom, trembling, breathlessness, and tachycardia. Anxiety may impair working memory, attention, and problem-solving skills (Andreescu & Varon, 2015). In older adults, somatic complaints are more common, such as constipation, nausea, and sleep disturbance. Worries about health, disability, and finances are also common. One is more likely to learn of a patient's anxiety by asking the question, "How do you feel when you are under stress?" than by asking, "Are you anxious?" Patients with specific phobias may have an irrational fear to something that poses little danger, such as fear of crowds or natural phenomena (heights, lightening). Specific phobias may occur following a traumatic event, such as falling. Symptoms of anxiety in older adults often overlap with symptoms of physical disorders, depression, and dementia. Generalized anxiety disorder (GAD), social anxiety, specific phobia, and anxiety disorder related to substance use, medication, or another medical condition. Panic disorder and agoraphobia are less common in older adults ⇒ **Diagnostic criteria** A diagnosis of GAD according to the DSM-5 requires excessive anxiety, difficulty controlling worry, and associated symptoms (at least three) including restlessness, easy fatigability, difficulty concentrating, irritability, muscle tension, difficulty falling or staying asleep, or restlessness Diagnostic Tests: Complete a history and physical examination. Laboratory tests can rule out medical conditions with anxiety symptoms, including complete blood count (CBC), CMP, and TSH. Order additional tests based on the findings of the history and physical examination. Valid assessment scales to help diagnosis and assess older adults for anxiety include the Geriatric Anxiety Inventory (GAI) and the Geriatric Assessment Scales. ⇒ **1st line treatment (mild, moderate, severe)** Treatment: Treatment for anxiety should reduce symptoms and improve functioning. Simply listening, being compassionate, and showing respect are important to improving outcomes. Comorbid depression and medical conditions should be treated. There are no large-scale studies of pharmacotherapy for late-life anxiety disorders to guide treatment decisions, as randomized controlled trials largely exclude those more than 65 years old. Evidence from studies with younger patients suggests both pharmacotherapy and psychotherapy, especially CBT, are effective. *"Start low and go slow"* with medication dosing to avoid risks from drug interactions. Older adults are more likely to take many medications and may have side effects from aging changes in absorption, metabolism, distribution, and excretion of medication. Doses are often started at half the usual adult starting dose and titrated slowly upward. Evaluate and manage side effects, because as many as 25% of patients stop taking medication in the first 6 months due to side effects. First-line treatment includes the *selective serotonin reuptake inhibitors (SSRIs)* because they have the least [illegible] existing medical conditions. Escitalop[illegible] adults, although citalopram

should not be used routinely in doses above 20 mg daily due to prolongation of QT interval precautions. GI disturbances, sexual dysfunction, and altered mental status due to hyponatremia may occur.

Serotonin-norepinephrine reuptake inhibitors (SNRIs), including Venlafaxine and Duloxetine, have been shown to be effective in older adults with anxiety. Blood pressure should be monitored with high doses of SNRIs. **Benzodiazepines,** including lorazepam, alprazolam, and clonazepam, are effective and may be used as a bridge until the SSRI takes effect. They are not the first choice due to the risk of falls and confusion.

Buspirone and gabapentin are also used as secondary agents when first-line therapy fails, and anxiolytic therapy is warranted.

CLINICAL RECOMMENDATION
Anxiety disorders are associated with an elevated risk of a range of different cardiovascular events, including stroke, coronary heart disease, heart failure, and cardiovascular death.
CBT or relaxation training can be used to treat anxiety in older adults.
The SSRIs are generally considered first-line pharmacological treatments for GAD; escitalopram and sertraline are best studied.
Venlafaxine, duloxetine, tricyclic antidepressants, and pregabalin are alternative drug therapies.
Augmenting SSRIs with CBT results in reduced anxiety among older adults.
Exercise, mindfulness, and relaxation training have been shown to reduce chronic anxiety in older adults.
Listening to music reduces anxiety in older adults.

⇒ **Medication management**

Maintenance SSRI use has been shown to reduce relapse of anxiety in older adults. SSRIs can increase anxiety if started at higher doses. It may take several weeks for full effect to occur.

Unipolar Depression (Kennedy and Dunphy)

⇒ **Signs and symptoms, risk factors, prevalence**

Pervasive and sustained mood of sadness, discouragement, lack of pleasure in usual activities, guilt, loss of motivation, low energy, and sleep and/or appetite disturbances.

Depression is described as a pervasive feeling of sadness or a lack of interest or pleasure in previously enjoyed or usual activities. Feelings of guilt, low self-esteem, sleep and appetite disturbances, low energy, and poor concentration are common.

Late-life depression is defined as a new onset of depression occurring in one's *sixties*.

Depression may be categorized as

- a single episode or recurrent
- further qualified as mild, moderate, or severe
- with or without features such as melancholy, mood-congruent, catatonia, peripartum

  onset, or with seasonal pattern.

Types of geriatric depression include

- MDD
- Vascular depression
  The comorbidity of depression, vascular disease, vascular risk factors, and the association of ischemic cerebral lesions with distinctive behavioral symptoms supports the "vascular depression" hypothesis. This hypothesis proposes that cerebrovascular disease may predispose, precipitate, perpetuate, or exacerbate some geriatric depressive syndromes
- Dysthymia
- Depression that manifests as a comorbid condition in dementia, bipolar disorder, and executive dysfunction

Depression is not a normal part of the aging process

⇒ Prevalence (Dunphy)

Diagnostic criteria: Diagnostics to assess for underlying or undiagnosed medical causes of depressive symptoms should be ordered.

Standard blood work includes:

- CBC with differential
- CMP
- lipid panel
- thyroid function studies (TSH with reflex T_4)

While the tricyclics (TCAs) and mono-amine oxidase inhibitors (MAOIs) are still available, these are no longer considered first-line recommendations.

⇒ 1st line treatment (mild, moderate, severe)

⇒ Medication management

Monitor and evaluate therapeutic response to antidepressant therapy, and observe for side effects, tolerance, and unremitting symptoms of depression.
Studies show that the majority of patients on a single agent (monotherapy) do not tolerate it, have limited or no response, stop the medication within the first 3 months, or never receive an adequate dose or trial of medication.
Consequently, monotherapy is effective in approximately one-third of patients, and the great majority do not reach remission.

- For those patients who do not respond adequately to monotherapy, other treatment strategies may be employed.
- Switching agents within the same class or combining different types of antidepressants (e.g., a combination of sertraline and bupropion) may result in symptom remission.
- With multiple failed trials of monotherapy or combination therapy, the patient may be considered to have treatment-resistant depression.
- Several second-generation antipsychotic agents are FDA approved for augmentation to antidepressant therapy in treatment resistant depression:
- aripiprizole (Abilify)
- quetiapine extended release (Seroquel XR)
- olanzapine (Zyprexa)

⇒ Incidence is community versus assisted living environments (Kennedy)

⇒ **Bipolar Depression**

Signal Symptoms: Variable presentation ranging from depression to mania or hypomania, feelings of grandiosity, rapid speech, or irritability. Up to 22% of older adults with bipolar disorders experience anxiety symptoms Cognitive deficits affecting verbal fluency and memory are common in older adults The depressive symptoms often include trouble with eating and sleeping Bipolar disorders are classified as

1. *Bipolar I disorder* requires an individual to have experienced at least one manic episode. A manic episode involves a change in mood that may be expansive, euphoric, or irritable, and accompanied by an increase in energy level. Most patients also have depressive episodes, but this is not a required component.

2. *Bipolar II disorder* requires at least one prior episode of major depression and at least one hypomanic episode, a milder form of mania.

3. *Cyclothymic disorder* is characterized by milder mood alterations that occur over a longer period of time, while unspecified bipolar disorder consists of symptoms that cause clinical impairment but do not meet criteria for the previously mentioned listings

4. Other specified bipolar and related disorders

Each depends on the presentation and intensity of symptoms. It is important to distinguish bipolar disorder from major depression, as treatment differs.

Elevated mood, presenting as euphoria or irritability. Dysphoria, manifesting with depression alone or with irritability. Rapid cycling includes back-and-forth shifts from mania to depression. Inquiring about suicide ideation or intent should be addressed at every visit. Psychotic symptoms can present in either manic or depressed states, and cognitive impairment is common. The acronym DIGFAST has been used to describe signs and symptoms during a manic or hypomanic phase. According to the DSM-5, the individual must also experience increased energy while having these symptoms

- **D**istractibility
- **I**nsomnia
- **G**randiosity
- **F**light of ideas
- **A**ctivities (hyperactive, does not require rest)
- **S**peech (rapid, can be garbled)
- **T**houghtlessness (impulsivity)

Symptoms during the depressive phase are similar to those of major depression. Use the acronym SIGECAPS:

- **S**leep disturbance
- **I**nterest/pleasure reduction
- **G**uilt feelings, thoughts of worthlessness
- **E**nergy changes/fatigue
- **C**oncentration/attention impairment
- **A**ppetite/weight changes
- **P**sychomotor disturbances

⇒ **Diagnostic Criteria:** The *Mood Disorder Questionnaire (MDQ)* is a validated (Hirschfeld et al., 2003, 2000) screening tool to assess for bipolar spectrum disorder, however is not specific to older adults. The tool can be accessed at

For patients with depressive features, the *Geriatric Depression Scale*, regular (www.stanford.edu/~yesavage/GDS.english.long.html) or short form (www.stanford.edu/~yesavage/GDS.english.short.score.html), is recommended as a screening tool.

Medication management –first line; Drug therapy is specific to different bipolar disorder states

Treatment: The goal is remission of symptoms. *There are no specific guidelines specific to older adults, however, practice guidelines generally suggest similar pharmacological treatment for older adults as with younger adults*

Patients with bipolar disorder are often challenging to manage because of the fluctuating and chronic nature of bipolar disorder. Depending on the presentation and severity, inpatient treatment may be required to stabilize the patient.

First-line treatment for late-life mania includes

- mood stabilizers lithium and valproic acid
- antipsychotics, quetiapine and olanzapine

Because older adults are frequently on multiple medications for other comorbid conditions, monotherapy has been recommended as a starting point with a backup plan for adding other drugs as indicated.

Patients with coexisting dementia require individualized treatment, and co-management by a geriatric psychiatrist is advised. There is early evidence of a neuro-protective affect for developing dementia in those prescribed lithium

Bipolar Mania U.S. Food and Drug Administration (FDA)-Approved Drugs

- Anticonvulsant mood stabilizers: Lithium, valproic acid, divalproex, or carbamazepine (second line)
- Antipsychotics: Olanzapine, risperidone, quetiapine, ziprasidone, aripiprazole, asenapine

Bipolar Acute Depression FDA-Approved Drugs

- Anticonvulsants: Lithium
- Antipsychotics: Quetiapine, lurasidone, olanzapine-fluoxetine combination.

Bipolar Maintenance FDA-Approved Drugs

- Mood stabilizers: Lithium, lamotrigine, valproic acid
- Antipsychotics: Olanzapine, aripiprazole, quetiapine, risperidone, ziprasidone

Treatment may require a combination of the previously mentioned medications

Electroconvulsive therapy (ECT) is highly effective in resistant cases of bipolar depression and should be considered if drug therapy is ineffective

Dosing should begin at the lowest dose and be slowly increased, while monitoring comorbidities and adverse effects. Benzodiazepines are sometimes used for acute

agitation in mania. SSRIs are generally not recommended for bipolar depression, as they are often ineffective and can induce mania; however, they are used in selective, resistant cases.

A collaborative care model has been successful for patients with combined chronic medical and mental health problems
Establishing a therapeutic alliance is key to management; psychotherapy and psycho-education are also an important part of treatment

⇒ **Medication metabolic side effects**.

Lithium:

initial evaluation of renal, cardiac, and thyroid function before initiating therapy, and then periodically during therapy.

Lithium levels need close monitoring during the initial period and periodic monitoring once stabilized.

Concurrent use of NSAIDs, thiazide or loop diuretics, and angiotensin-converting enzyme (ACE) inhibitors *may adversely affect* lithium levels

- Adverse effects include
  - tremor
  - hypothyroidism
  - weight gain
  - cognitive and renal impairment

Valproic acid:

- drug levels, liver function tests (LFTs), and CBC. Adverse effects include weight gain, hepatotoxicity, pancreatitis, and thrombocytopenia.

Atypical antipsychotics

- have weight gain, glucose, and lipids monitored.
- QT interval prolongation can also occur.

prescribed for older adults with dementia=increases mortality.

⇒ **Sleep/ Wake Disorders (Dunphy)**

⇒ Underlying medical causes
⇒ Underlying psychological causes
⇒ Most common sleep disorder (Dunphy)

Insomnia

Signs piness, loud snoring (sleep apnea tability, difficulty

concentrating, sleep that is not refreshing and restful, daytime fatigue, an older adult may spend 10 to 12 hours in bed at night trying to sleep

Diagnostic criteria (medical and psychiatric causes: insomnia is a clinical diagnosis, sleep history should include an assessment of daytime sleepiness, fatigue, or sleep disturbance; the sleep environment; and the duration of symptoms. Additionally, information on frequency and duration of awakenings, sleep times, nap times, and lengths is important

o 1st line treatment for chronic insomnia

1. **Chronic insomnia**

Thorough family hx (inc. sleep problems), A validated self-administered instrument, such as the Epworth Sleepiness Scale or Stanford Sleepiness Scale, sleep diary, interrogate sleep partner (if any), If sleep apnea is suspected, refer for polysomnography, review sleep hygiene tips (Combined, sleep hygiene instruction and cognitive behavioral therapy are more effective than either modality alone or usual treatment), music therapy, aerobic exercise

1) Transient insomnia

avoid caffeine 12 before bedtime, D/C ETOH and sleep-interrupting drugs, OTC melatonin, if ineffective, a short-acting sedative-hypnotic, such as zolpidem (Ambien) or zaleplon (Sonata), at lowest dosage before desired bedtime for 1 week or less (space to avoid S/E), benzodiazepine - short-acting- temazepam (Restoril).

o **Medication management**

Chronic insomnia

temazepam (Restoril) for sleep onset insomnia

eszopiclone (Lunesta) for sleep onset and sleep maintenance

zolpidem CR and zolpidem (AmbienCR and Ambien)

zolpidem sublingual (Intermezzo) for sleep maintenance

zaleplon (Sonata) and ramelteon (Rozerem) for sleep onset insomnia.

All of these drugs are listed as potentially inappropriate medications (PIMs) on the Beers list (2015) to be avoided in older adults

Transient insomnia

zolpidem (Ambien)

zaleplon (Sonata)

temazepam (Restoril)

	⇒ Prevalence in the elderly
4	Osteoarthritis (Kennedy, Dunphy, Kahn Academy) o **Signs and symptoms including musculoskeletal changes (symmetrical vs asymmetrical)** *Osteoarthritis morning stiffness lasting <30 mins but improves with activity. Also known as degenerative joint disease.* *It most commonly affects hips, knees and cervical and lumbar spine. While the joint deformity with minimal pain is usually found in the DIP and PIP joints of the hand and the first metacarpal joint and metatarsophalangeal (MTP) joint* o **Radiographic findings:** Two views of the affected joint are recommended with the exception of the sacroiliac joint and the pelvis. Other types of imaging tests such as ultrasound and MRI may be used to detect damage to cartilage, ligaments and tendons, which cannot be seen on Xray o **1st line treatment:** Treatment: multifaceted approach Walking Water therapy Acetaminophen NSAIDs- cyclooxygenase type 2(COX-2) such as celecoxib (Celebrex) 50-100mg BID. In patients who can not afford COX-2 may try, nonacetylated salicylates such as Magnesium trisalycylate 500-750mg BID-TID. Tramadol can be given at 50mg Q 4 -6 hours Opiates such as codeine and oxycodone can be used for severe OA Glucosamine and chondroitin Topical diclofenac sodium **Osteoporosis** · Personal history of fractures? Family hx? Questions about libido and potency in men are important to determine secondary gonadal issues. ·Most common fractures are those of the spine, hip, wrist, and distal forearm. ·Exceptions are fractures of the fingers, toes, face, and skull, which tend to be more related to trauma than low bone mass

	Signs and symptoms, finding presentation **Medication management** Tramadol can be given at 50mg Q 4 -6 hours Opiates such as codeine and oxycodone can be used for severe OA Glucosamine and chondroitin Topical diclofenac sodium

- **WHO Diagnostic criteria (Dunphy p.865)**

Clinical tool developed to assist clinicians in the identification of patients at high risk for fractures:

1. FRAX: Fracture Risk Assessment Tool
    a. screen patients with low bone density who are not currently receiving treatment to help determine need for treatment
    b. integrates validated clinical risk factors and BMD of the femoral neck to calculate the 10-year probability of hip fracture and the 10-year probability of a major osteoporotic fracture (clinical spine, forearm, hip, or shoulder)
    c. not appropriate to use FRAX to monitor treatment response

- **DEXA** results: normal, osteopenia, osteoporosis

Diagnostic Tests: Osteoporosis is defined based on the BMD measurement

BMD is measured:

Dual-energy x-ray absorptiometry (DEXA or DXA)

The results are reported as T- and Z- scores

- WHO T-score compares the bone mass of the patient to the mean of a young adult (20-year-old healthy woman)
- Recommendations apply to postmenopausal women and men age 50 years and older
- In premenopausal women, men less than age 50 years, and children, the International Society for Clinical Densitometry (ISCD) recommends the diagnosis of osteoporosis be made based on ethnic- or race-adjusted Z-score
- A Z-score of –2 or less is defined as low BMD for chronological age and those above –2 are within the expected range for age
- T-score of -1.0 or above = normal bone density
- T-score between -1.0 and -2.5 = low bone density, or osteopenia
- T-score of -2.5 or lower = osteoporosis

- **Medication management**

Treatment of osteoporosis should be considered for patients with low BMD, as well as a 10-year risk of hip fracture of 3% or more or a 10-year risk of a major osteoporosis-related fracture of 20% or more.

GOAL: to prevent fractures

Basic level of prevention and treatment includes diet, exercise, and fall prevention strategies. Adequate intake of calcium and vitamin D is essential to decrease bone loss and bone turnover.

Vitamin D replacement is available in two forms, ergocalciferol (vitamin D_2) or cholecalciferol (vitamin D_3). optimal and safe range.
Vitamin D levels should be at least 77 µmol/L or 30 ng/mL because lower levels can result in secondary hyperparathyroidism and have been linked to an increase in

When interpreting serum calcium level in older adults, it is important to correct for albumin level because 30% to 55% of calcium is bound to albumin. A falsely low measurement results when albumin is low. Every 1 g/dL of albumin binds 0.8 mg/dL of calcium. The correction adds 0.8 mg/dL for every 1 g/dL decrease in albumin. Ionized calcium measures free calcium, but it is an expensive test that is difficult to interpret; consultation before requesting may be helpful

Rheumatoid Arthritis (Kennedy, Dunphy, Kahn Academy)

Rheumatoid Arthritis (Kennedy-Malone, p.322) - incurable autoimmune condition that affects synovial joints in the body

o Signs and symptoms

morning stiffness > 1 hr

joint swelling & pain (small joints of hands, wrists, & feet)

symmetrical inflammatory polyarthritis

decreased physical function

In older adults, constitutional symptoms with RA may include low-grade fever, weight loss, malaise, and depression.

Clinical joint findings

hyperflexion of the PIP joints

flexion of the DIP joints (swan neck deformities)

flexion of the PIP joints and extension of the DIP joints (boutonniere deformity)

ulnar deviation of the metacarpophalangeal joint

knee and ankle effusions

skin should be checked for subcutaneous nodules, which are generally <1 to 3 cm in diameter - firm and fixed on palpation

systemic evaluation

eye examination - keratoconjuctivitis, scleritis, corneal ulcers

lungs - pleuritis, pneumonitis

cardiac examination -pericarditis

nerve- nerve entrapment, sensory neuropathy

o **Radiographic findings**

	• **Diagnostic tests- highest sensitivity & specificity) (Kennedy): Blood tests** rheumatoid factor (RF), CRP, ESR, anti-citrullinated peptide antibodies (when accompanied by high RF titer), anti-CCP antibodies, CBC may show normochromic, normocytic anemia, mild leukocytosis, and thrombocytosis o **1st line treatment** methotrexate - disease-modifying antirheumatic drugs (DMARDs) o Medication management corticosteroids, analgesia, NSAIDs DMARDS - suppress immune system, may take up to 3 mos for full effect methotrexate - 5mg once/w, co prescribed with folic acid ■ Sulfasalazine ■ Leflunomide ■ Hydroxychloroquine TB and hep testing prior to tx. TNF inhibitor biological agents etanercept, adalimumab, infliximab, certolizumab, golimumab, rituximab, abatacept