

COMPLEX CASE: SKILLED NURSING CARE

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LEARNING OBJECTIVES

At the end of the presentation and after reviewing the accompanying reading materials, the participant should be able to:

1. Interpret results of screening and assessments relevant to the management of the geriatric patient.
2. Select the appropriate treatment and monitoring for a complex patient-case with multiple conditions, including
 - Anemia
 - Anxiety
 - Deep vein thrombosis (DVT) prophylaxis
 - Osteoporosis
 - Pain management
 - Syndrome of inappropriate antidiuretic hormone (SIADH)
 - Falls
 - Constipation
3. Explain the need for continuity of treatment and communication across the spectrum of services and during transitions between care settings.
4. Identify potential medication-related causes of declining physical and cognitive function.
5. Select methods to facilitate medication reconciliation during transitions of care.
6. Summarize limitations of biomedical information for the care of older adults.
7. Apply outcomes of investigations to optimize care of older adults.
8. Develop strategies to prevent or resolve iatrogenic conditions.
9. Identify elder abuse/neglect (e.g., physical, psychological, and financial).
10. Identify resources to assist in prevention, reporting, and treatment of elder abuse/neglect.

Premise

You are a clinical geriatric pharmacy specialist who practices at Oak Springs, a 30-bed skilled nursing facility (SNF). You have a great working relationship with the physicians and therapists at Oak Springs and are an integral member of the healthcare team. As the pharmacist, you are responsible for evaluating and monitoring every patient's therapy at the facility. Upon admission to the facility, a complete medication reconciliation and review must be performed, in addition to monthly chart reviews. You are responsible for providing comprehensive drug therapy management and education for all patients residing in the SNF.

Patient Case #1

Chief complaint: "I am here to get better and go home. I would like to go home as soon as possible!"

RH is a 77-year-old Native American female patient who is being admitted to Oak Springs SNF for an inpatient rehabilitation program for physical therapy (PT) and occupational therapy (OT). RH is status-post day 5 for an open reduction internal fixation (ORIF) to her right hip after she suffered a fall. She had a somewhat complicated hospital stay and is recovering from delirium and pneumonia. Upon discharge assessment from the hospital, she was deemed to be a high fall risk and not safe to go home at this time.

At hospital discharge, she was assessed and determined to be weight bearing as tolerated (WBAT) to her right lower extremity. Per her daughter, RH was completely independent of all activities of daily living (ADLs) and instrumental activities of daily living (IADLs) prior to her fall and she cared for her 7-year-old great granddaughter during the day. Subacute rehabilitation/SNF was recommended for at least 4 weeks of therapy with re-assessment at that time. She plans on being discharged back home with her family.

1. Past Medical History

- Anxiety
- Hypertension
- Hyperlipidemia
- Type 2 diabetes mellitus
- Osteoarthritis (OA)
- ORIF R hip (five days ago)

2. Medications (upon hospital discharge)

- Acetaminophen 650 mg orally every 6 hours
- Alprazolam 0.25 mg orally twice daily*
- Aspirin (enteric coated) 81 mg orally once daily*
- Carvedilol 6.25 mg orally twice daily with meals*
- Ceftriaxone 2 g IV every 24 hours for one more dose
- Cetirizine 10 mg orally once daily*
- Citalopram 10 mg orally once daily
- Glipizide 5 mg orally twice daily with meals*
- Enoxaparin 40 mg subcutaneously once daily
- Famotidine 20 mg orally twice daily
- Lisinopril 40 mg orally once daily*
- Oxycodone 5 mg orally every 6 hours as needed for moderate to severe pain
- Senna 8.6 mg orally once daily
- Simvastatin 20 mg orally daily at bedtime*
- Extended-release verapamil 240 mg orally daily at bedtime*
- Quetiapine 12.5 mg orally as needed for agitation

*denotes home medications

Question 1:

Upon a patient's admission to the SNF, you are required to conduct a patient assessment and medication reconciliation. During RH's transition of care medication reconciliation, which of the following medications should be addressed due to lack of indication and/or necessity?

- A. Aspirin, citalopram, famotidine
- B. Citalopram, famotidine, quetiapine
- C. Aspirin, famotidine, quetiapine
- D. Aspirin, citalopram, quetiapine

I. Causes and consequences of poor medication reconciliation

- A. Causes of medication discrepancies and errors during the medication reconciliation process^{1,2}
 - 1. Rushed decision making
 - a. Family and patient not appropriately educated about expectations post-hospitalization and being discharged prematurely
 - 2. Problematic timing of discharges
 - 3. Poor communication is a major contributor
 - 4. System-generated versus patient-generated
 - a. System-generated: transcription error, duplication of orders
 - b. Patient-generated: using medications not as directed, poor adherence at home
 - 5. Intentional versus unintentional
 - a. Most errors are unintentional
- B. Common discrepancies found in medication reconciliations
 - 1. Incorrect indication, no monitoring parameters, omissions, incorrect dose, incorrect frequency, duplications, interactions, need to continue/stop dates¹⁻⁴
- C. Consequences of poor medication reconciliations¹⁻⁴
 - 1. Inappropriate medications, prescribing cascade, lack of indicated use, delays in care, increased expenditures

II. Comprehensive medication reconciliation

- A. Medication reconciliation should be proactive, not retrospective^{1,5}
 - 1. Unfortunately, most of the time it is done retrospectively, especially in long-term care and skilled nursing facilities/units
- B. Most recent medication list does not always mean the best possible comprehensive medication history^{1,3}
 - 1. Systematic approach → records, discharge list, prescription containers, patient/caregiver interview to get the pre-hospitalization history
 - a. "Bad data" are perpetuated when all we are doing is comparing an old list to a new list
 - 2. Open communication and an interdisciplinary "handoff"^{1,5}
 - a. Talk to hospitalist or nurse who cared for the patient prior to the change in venue
 - 1) Speak with those who have the most recent knowledge of patient
 - 3. Involve patient and family/caregiver¹
 - a. New patient orientation to help explain and introduce care in this type of setting to help with expectations

4. Electronic medication reconciliation tools³
 - a. Software and databases that can check for duplications or drug interactions

III. Medication reconciliation resources

- A. The American Society of Health-System Pharmacists (ASHP) Medication Reconciliation Guidance Document for Pharmacists is a great general resource to use in various pharmacy settings for helping assess medication lists⁶
 1. Obtain a thorough medication history using multiple sources of information
 - a. Chart, patient/caregiver interviews
 2. Conduct medication reconciliation and identify discrepancies
 3. Contact prescribers to make recommendations and suggestions for clinical appropriateness
- B. Guidelines for Admission Medication Regimen Review (aMRR) in the Nursing Facility Setting – from the American Society of Consultant Pharmacists (ASCP)⁷
 1. Should be timely and performed as close to actual admission as possible
 2. Four-step process
 - a. Obtain necessary information and records for review
 - 1) Facility orders, medication administration record, diagnosis list
 - b. Clinical review process
 - c. Communication of irregularities from review
 - d. Documentation of review

Question 2:

Based on her clinical presentation, RH meets the criteria to start pharmacotherapy for osteoporosis. After your initial assessment and review of RH at the SNF, you decide to recommend an agent.

In addition to initiating a calcium/vitamin D supplement, which of the following is the most clinically appropriate treatment option for RH's osteoporosis?

- A. Alendronate 35 mg orally once weekly
- B. Calcitonin 200 IU, 1 spray in one nare intranasally daily, alternating nostrils daily
- C. Ibandronate 150 mg orally once weekly
- D. Zoledronic acid 5 mg intravenously over 15 minutes every year

IV. Osteoporosis

- A. Tools for assessment⁸⁻¹⁰
 1. Central dual-energy x-ray absorptiometry (DXA)
 - a. T-score, Z-score, bone mineral density (BMD)

- 1) T-score: represents a patient's value compared to someone of the same gender, and from the age population of young healthy adult
 - 2) Z-score: represents a patient's value compared to someone of the same age, gender, and ethnically matched population
2. Fracture risk assessment tool (FRAX®)
 - a. Online tool that predicts the 10-year probability of having an osteoporosis-related fracture
 - 1) FRAX is only a reliable assessment of risk prior to pharmacotherapy being started
 - b. Important to select the right continent and country when using this online tool
- B. Initiation of pharmacological treatment⁸⁻¹⁰
1. Central DXA
 - a. T-score ≤ -2.5 in spine, femoral neck, or total hip
 - b. T-score between -1 and -2.5 **and** FRAX® 10-year all major osteoporosis-related fracture probability $\geq 20\%$ **or** FRAX® 10-year hip fracture probability $\geq 3\%$ in U.S.
 2. Non-traumatic fragility fracture of hip or spine
 - a. Clinical definition of osteoporosis, regardless of DXA results

V. Bisphosphonates⁸⁻¹³

Table 1. Bisphosphonates Overview

	Alendronate	Risedronate	Ibandronate	Zoledronic acid
Dosage forms	Oral only (vitamin D combo, effervescent tablet)	Oral only (delayed release, calcium carbonate combo)	Oral; intravenous injection	Intravenous infusion only
Prevention dose available?	Yes	Yes	Yes	Yes
Evidence in:				
- Vertebral fx	Yes	Yes	Yes	Yes
- Nonvertebral fx	Yes	Yes	No	Yes
- Hip fx	Yes	Yes	No	Yes
- Glucocorticoid-induced osteoporosis	Yes	Yes	No	Yes
Recommended for men?	Yes	Yes	No	Yes

- A. Alendronate, risedronate, and zoledronic acid are first-line treatments for osteoporosis
- B. Ibandronate is not considered to be "broad spectrum" due to it only having evidence for vertebral fractures
- C. Bisphosphonate cautions/safety^{8-10,12-13}
 1. Avoid in: poor renal function (GFR $\leq 30-35$ mL/min), hypocalcemia, active upper gastrointestinal (GI) disease or esophageal abnormality (oral version only), inability to follow administration instructions, shortened life expectancy
 - a. Make sure GI disease is controlled before starting bisphosphonate

2. Common side effects: upper GI irritation, bone/joint pain
3. Potentially severe but rare side effects: atypical femur fractures (AFF), osteonecrosis of the jaw (ONJ), atrial fibrillation
 - a. ONJ typically presents as deep tooth pain
 - 1) These patients may present initially to the dentist complaining of oral pain
 - b. ONJ and AFF are more common with longer duration of use

VI. Other medication options⁸⁻¹⁴

Table 2. Other Medication Options to Reduce the Risk of Fracture

	Classification	Route of Administration	Demonstrated Fracture Risk Reduction	Recommended for Men
Antiresorptive Agents				
Denosumab	Monoclonal antibody - RANKL/RANKL inhibitor*	Subcutaneous injection	Vertebral, hip, nonvertebral	Yes
Raloxifene	Estrogen agonist/antagonist	Oral	Vertebral only	No
Calcitonin	Calcium metabolism modifier	Intranasal spray; subcutaneous injection	Vertebral only	No
Anabolic Agents				
Teriparatide	Parathyroid hormone analog	Subcutaneous injection	Vertebral, nonvertebral (including hip)	Yes
Abaloparatide	Parathyroid hormone analog	Subcutaneous injection	Vertebral, nonvertebral (including hip)	No (<i>pending</i>)
Antiresorptive/Anabolic Agents				
Romosozumab	Monoclonal antibody - inhibits sclerostin	Subcutaneous injection	Vertebral, nonvertebral (including hip)	No

*RANKL = receptor activator of nuclear factor kappa-B ligand

- A. Denosumab is considered first-line treatment for osteoporosis – and a “broad-spectrum” osteoporosis medication
 1. Affordability of agent should be considered due to high cost of product
 2. Denosumab is a part of REMS program due to adverse effects, including hypocalcemia, ONJ, AFF, serious infections, and dermatological reactions
- B. Raloxifene has a US Boxed Warning for causing increased thromboembolism and stroke, so may be better for use in younger women closer to menopause
 1. Used more for second- or third-line treatment in postmenopausal osteoporosis
- C. Calcitonin has a unique administration in that it is a nasal spray that is only used in one nare once daily, alternating nares daily
 1. Example: left nare would be sprayed once on odd days and right nare would be sprayed on even days

2. A 2013 meta-analysis found calcitonin use to be associated with an increased correlation of malignancy, so use this medication with caution¹⁵
 - a. However, another review in 2016 found that the association was weak and there is little biological plausibility for the cause¹⁶
- D. Parathyroid hormone analogs are anabolic agents that help build up bone
 1. Reserved more for severe osteoporosis, including patients who have a low T-score and history of fractures
 2. Abaloparatide does not have evidence for use in men, yet a study is currently in progress
- E. Romosozumab^{14, 17}
 1. Approved in April 2019 for postmenopausal osteoporosis, but does have studies for use in men
 2. Increases bone formation and decreases bone resorption
 3. Two consecutive subcutaneous (subQ) injections (105 mg each = 210 mg total) once monthly
 - a. Pre-filled syringes should be stored in refrigerator and allowed to sit at room temperature for at least 30 minutes before administration
 - b. Upon removal from the refrigerator, may store at room temperature in the original carton for up to 30 days
 4. US Boxed Warning: increases the risk of myocardial infarction (MI), stroke, and cardiovascular (CV) death
 - a. Should not be initiated in patients who have had a MI or stroke within past year

VII. Osteoporosis last-line therapies

- A. Hormonal products^{8-10,13,}
 1. Estrogen and conjugated estrogen/bazedoxifene
 2. Variety of dosage formulations, preparations, and regimens
 3. Evidence for prevention of vertebral and hip fractures in postmenopausal women
 4. Woman's Health Initiative Investigators (2002)¹⁸
 - a. Increased risk of MI, stroke, invasive breast cancer, thrombotic events
 5. Tend to avoid these treatments if possible
- B. Do not recommend combination therapy at this time
 1. Some evidence and case reports of combination of antiresorptive therapies with anabolic agents but not enough evidence to suggest in recent guideline updates

VIII. Calcium & vitamin D⁸⁻¹⁰

- A. Important to have patients take these in addition to other prescription osteoporosis medications
- B. Elemental calcium: carbonate (40%) and citrate (21%)
 - 1. Citrate is a soluble calcium salt
 - a. Easier for older adults to absorb and is therefore preferred for the older adult
 - 2. Recommended Daily Allowance (RDA): 1000-1200 mg/day⁸⁻¹⁰
 - 3. Dietary intake must be factored in as well
- C. Vitamin D: ergocalciferol (D₂) and cholecalciferol (D₃)
 - 1. RDA: 1000 IU/day (25 mcg), up to 4000 IU/day (100 mg)⁸⁻¹⁰
 - a. Higher dose is recommended to compensate for malabsorption issues in older adults
 - b. Vitamin D₃ is the more activated version of vitamin D, and is preferred in patients who have chronic kidney disease (CKD)/decreased renal function, like older adults⁸
 - 1. Additional supplementation needed for vitamin D insufficient or deficient patients
 - a. Preferred: 5,000 IU orally daily for 8-12 weeks then redraw a level⁸
 - b. Alternately: 50,000 IU orally weekly for 8-12 weeks then redraw a level

IX. Postmenopausal osteoporosis – stepwise approach

- A. See Supplement 1 from American Association of Clinical Endocrinologists (AACE)/Alliance for Clinical Education (ACE) 2020 Postmenopausal Osteoporosis Guidelines⁸
 - 1. Correct calcium/vitamin D deficiencies and any causes of secondary osteoporosis before initiating pharmacological therapy
 - 2. Educate on lifestyle/non-pharmacological methods and fall prevention to prevent fractures
 - 3. If patient is high risk/no prior fractures
 - a. First line: alendronate, denosumab, risedronate, zoledronic acid
 - b. Alternative: ibandronate, raloxifene
 - 4. If patient is very high risk/prior fractures
 - a. First line: abaloparatide, teriparatide, denosumab, romosozumab, zoledronic acid
 - b. Alternative: alendronate, risedronate
 - c. Indicators of very high fracture risk in patients with low bone density would include advanced age, frailty, glucocorticoids, very low T-scores, or increased fall risk

Question 3:

If RH is sent to a local breast health center for a central DXA today prior to starting her new pharmacotherapy for osteoporosis, how soon would RH need to have another DXA scan performed to assess response to treatment for her osteoporosis?

- A. 4 weeks
- B. 6 months
- C. 2 years
- D. 10 years

X. Monitoring – osteoporosis**A. Central DXA^{8-10,13}**

- 1. Every 1-2 years (AACE/ACE and National Osteoporosis Foundation [NOF]), every 1-3 years (The Endocrine Society), up to every 5 years (American College of Physicians [ACP])
 - a. AACE/ACE and The Endocrine Society are in conflict with ACP

B. Biochemical markers of bone turnover^{8-10,19}

- 1. Resorption marker: serum C-terminal telopeptide (CTX)
- 2. Formation marker: serum carboxy-terminal propeptide of type 1 collagen (P1NP)
- 3. NOF, The Endocrine Society, and AACE/ACE guidelines mention that you may monitor when initiating and follow-up during therapy, but use is often limited in clinical practice
 - a. Usually can see changes around 3-6 months

C. Annual height changes¹⁰

- 1. A decrease in height can be a sign of a compression/vertebral fracture

XI. Duration of therapy – osteoporosis**A. Romosozumab^{14,17}**

- 1. Maximum duration: 12 months
- 2. Bone-forming effect declines after one year

B. Parathyroid hormone analogs^{8-9,12-13}

- 1. Maximum lifetime recommended use of 2 years of therapy
 - a. Abaloparatide has a US Boxed Warning for increased risk of osteosarcoma
 - b. US Boxed Warning for teriparatide was removed in November 2020 due to post-surveillance data²⁰

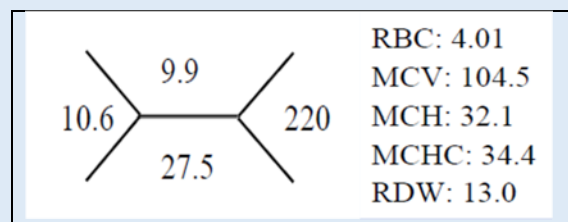
C. Bisphosphonate holidays^{8,9,19, 21-22-22}

- 1. Bisphosphonates bind strongly to bone, and even when treatment stops, the medication is continuously released and reabsorbed by the bony matrix for a while, which leads to the very long half-life of these medications → why bisphosphonates are the only medications indicated for drug holidays

- a. Drug holidays are beneficial since they can help decrease the risk of adverse side effects (e.g., ONJ and AFF) as well as healthcare costs, including medication costs
2. FLEX and HORIZON extension studies^{21,22}
 - a. FLEX extension trial → alendronate
 - 1) Studied patients who were on the oral active drug for five additional years versus placebo after at least five years of oral active drug
 - 2) There was more of a decrease in BMD in the placebo group, but no statistically significant increase for nonvertebral fractures and morphometric vertebral fractures; however, there was a statistically significant increase in clinically recognized vertebral fractures
 - b. HORIZON extension trial → zoledronic acid
 - 1) Studied patients who were on the intravenous active drug for 3 additional years versus placebo after at least three years of intravenous active drug
 - 2) Found similar results to the FLEX extension trial
3. Several recent guidelines and reports support the use of bisphosphonate holidays and try to offer additional guidance on how to implement and monitor bisphosphonate holidays
 - a. Low likelihood of fracture^{8,9,19}
 - 1) For patients with a low fracture risk, a bisphosphonate holiday can be considered after at least five years on an oral bisphosphonate or three years on IV bisphosphonate
 - b. High likelihood of fracture^{8,9,19}
 - 1) For patients with a high fracture risk (e.g., older age, low hip T-score, high fracture risk score, previous major osteoporotic fracture, fracture on therapy), oral bisphosphonates should be considered for at least 6-10 years or IV bisphosphonate for six years before a holiday can be implemented
 - c. Duration of holiday^{8,9,19}
 - 1) Duration should be based on individual patient factors, such as an increase in fracture risk, a decrease in BMD beyond the least significant change of the DXA machine, or an increase in bone turnover markers
 - 2) Better evidence is needed for the length of these drug holidays

Question 4:

Your review of RH's admission labs reveals the following:



Based on these results, including decreased hemoglobin (Hgb) and hematocrit (Hct) and elevated mean corpuscular volume (MCV), what would be the most appropriate next step to address her anemia?

- A. Administer epoetin alfa to stimulate erythropoiesis.
- B. Measure serum vitamin B₁₂ level to check for pernicious anemia.
- C. Obtain a fecal occult blood test to rule out a gastrointestinal bleed.
- D. Start ferrous sulfate and check iron panel in three months.

XII. Anemia

- A. Public health crisis²³
 - 1. Minor problem with major implications²³⁻²⁵
 - a. Leads to falls, increase in fragility, reduced daily functioning, decreased quality of life
- B. Contributing factors²³⁻²⁵
 - 1. Age-related changes
 - a. Diminished erythropoiesis, worsening renal function, increased inflammatory markers
 - 2. Gender differences
 - a. Women are more at risk than men until 75 years of age and then it is more common in men
 - 3. Racial differences
 - a. Possible genetic mutations that have evolved over time that lead to differing concentrations of Hgb
 - 4. Medications
 - a. Anticoagulants/antiplatelets lead to increased risk of bleeding
 - b. Some medications decrease folate, vitamin B₁₂, or iron
- C. Common presentations of anemia in older adults²⁵⁻²⁶
 - 1. Deficiency-related anemias, anemias of chronic disease, unexplained anemia

XIII. Iron-deficiency anemia

- A. Causes: blood loss, atrophic gastritis, low iron intake²³⁻²⁵
 - 1. Many foods are fortified in Western society, unlikely to be an issue of under-consumption of iron in diet
- B. Gold standard: bone marrow aspirate stain or response to trial of iron²³
 - 1. Clinical definition: ↓ Hgb/Hct, ↓ MCV, ↓ serum iron, ↓ ferritin, ↑ total iron binding capacity (TIBC), ↓ transferrin saturation (TSAT)
 - a. $TSAT = (\text{iron/transferrin}) * 71.24$ or $TSAT = (\text{iron/TIBC}) * 100$
 - b. Of note, ferritin is an acute phase reactant so even if it is elevated, this does not rule out iron deficiency

C. Treatment: iron supplementation²³⁻²⁶

1. If there is a suspected bleed, then need to find the source of the bleed first
 - a. Need to stop the source of the bleed before supplementing or transfusing patient
 - 1) Common locations: GI tract, subdural hematoma, hemorrhoids
 - b. American Association of Blood Banks protocol: transfuse if Hgb is 7 g/dL or lower
2. Oral preferred over intravenous route unless end-stage renal disease (ESRD)
 - a. Intravenous is better in ESRD
 - b. Low doses (≤ 325 mg orally once daily or every other day dosing) preferred due to tolerability, especially in older adults
 - 1) May also take every other day as well due to increased absorption in adherent patients
 - c. Empty stomach versus with meals
 - 1) Give on an empty stomach to promote absorption, but may cause nausea so can give with food if needed
3. Ferrous versus ferric oral iron formulations
 - a. Ferric formulations have less bioavailability, yet may be a better phosphate binder in CKD
 - b. Ferrous formulations are better tolerated, most effective, and lower cost
 - 1) Ferrous gluconate is better tolerated than ferrous sulfate, yet has less elemental iron
4. Improved absorption with co-medications to decrease gastric pH²⁷
 - a. Vitamin C, fruit juices
5. Continued three months after iron deficiency corrected
 - a. Typically takes iron levels 4-6 months to normalize after starting treatment
 - b. Usually do not want lifelong therapy due to possible complications of iron build-up

XIV. Nutrient-deficiency anemia

A. Clinical definition: ↓ Hgb/Hct, ↑ MCV

B. Vitamin B₁₂ deficiency²³⁻²⁵

1. Also can see elevated levels of methylmalonic acid (MMA) and homocysteine in vitamin B₁₂ deficiency
2. Pernicious anemia, atrophic gastritis, dietary deficiency, GI compromise, drug-induced
 - a. Pernicious anemia affects older adults (median age of onset 70-80 years of age) and makes up over 3/4 of cases contributing to B₁₂ deficiency
 - b. Metformin is commonly known to cause vitamin B₁₂ deficiency; colchicine and proton pump inhibitors can also cause deficiency

3. Treatment: vitamin B₁₂ supplementation
 - a. Administered via oral, intramuscular (IM), or deep subcutaneous (subQ) routes²⁸
 - 1) Either is fine → oral may be preferred for patients and is cheaper unless neurological manifestations and may want to use intramuscular injection due to more rapid-acting
 - b. Lifelong therapy
 4. Watch for neurological manifestations
 - a. Vitamin B₁₂ deficiency can lead to neurological manifestations, including dementia-like symptoms; therefore, it may be helpful to check B₁₂ levels in patients who may be experiencing cognitive impairment to rule out B₁₂ deficiency anemia
- C. Folate deficiency²³⁻²⁵
1. Alcoholism, drug-induced, low dietary intake
 - a. Methotrexate is a big offender for causing folate deficiency; should always be supplemented in these patients
 - b. Some medications can contribute to folate deficiency, including phenytoin and carbamazepine
 2. Treatment: folic acid supplementation
 - a. Oral over parenteral route preferred
 3. Duration of therapy depends on cause
 - a. If chronic issues, such as alcoholism or need for medication, is causing folate deficiency, then may need to be on supplementation for life
- D. If both nutrient-deficiency anemias present, treat vitamin B₁₂ deficiency prior to folate deficiency
1. Treating folate first could mask symptoms of vitamin B₁₂ deficiency

XV. Anemia of chronic disease and unexplained anemia

- A. Anemia of CKD^{23-25,29}
1. Reduced erythropoietin production
 2. Treatment: parenteral iron supplementation plus erythropoietic-stimulating agents (ESA) for Hgb <10 g/dL
 - a. For dialysis patients, need iron supplemented in parenteral form since oral can be poorly absorbed, has better outcomes in this population, and helps to improve response to ESA
 - b. Iron stores should be repleted before starting ESA since iron deficiency is one of the main causes of ESA resistance
 - c. If a patient uses an ESA, the goal Hgb should not exceed 11.5 based on KDIGO guidelines²⁹
 - d. In older adult patients, Hgb goal may be closer to 9-10 g/dL to prevent complications²⁶
- B. Anemia of inflammation^{23-26,30}

1. Elevated inflammatory cytokines, \pm low serum iron
 - a. Seen often in chronic inflammatory disease states, such as rheumatoid arthritis
2. Treatment: treat underlying cause if possible, iron supplementation if low iron indexes, \pm ESA
- C. Myelodysplasia/hematologic malignancy²³⁻²⁶
 1. Bone marrow failure disorder
 - a. Anemia is an early sign of disease
 2. Treatment: bone marrow transplant, \pm ESA, blood transfusions, cancer treatments
- D. Unexplained anemia in older adults/senile anemia^{23-26,31}
 1. "Waste-basket" diagnosis, stem cell aging, hormone imbalances
 - a. One of the most common "causes" of anemia, especially mild anemia, in older adults and often diagnosed when other causes have been ruled out
 - b. Often related to blunted response of erythropoietin, rather than nutritional deficiencies, CKD, or inflammation
 - c. Can be seen when testosterone decreases in men as they age
 2. Treatment: treat underlying cause if possible, \pm ESA, supportive care/non-pharmacological interventions
 - a. Non-pharmacological options include good sleep habits, balanced diet, routine exercise, and overall "healthy lifestyle"
 - b. Patients often fail iron therapy and this can be a differential diagnosis when patients are suspected of having iron-deficiency anemia but fail iron replacement therapy²⁶

Question 5:

After several days at the facility, RH is complaining of pain when she attends physical therapy in the mornings and afternoons, and this sometimes limits her ability to fully participate in her sessions. She is using as-needed (PRN) oxycodone 5 mg orally once daily to help alleviate this pain after her therapy sessions, as well as her scheduled acetaminophen. She states that she took over-the-counter ibuprofen at home in the past and that can help her pain at times.

Which of the following is a US Boxed Warning associated with the use of nonsteroidal anti-inflammatory drugs (NSAIDs)?

- A. Increased risk of cardiovascular events
- B. Increased risk of suicidal ideations
- C. Increased risk of life-threatening serious rashes
- D. Increased risk of addiction, abuse, and misuse

XVI. Assessment – pain

- A. Nociceptive versus neuropathic versus mixed^{32,33}
 1. "PQRST" question approach
 - a. P = provoking/palliative factors

- b. Q = quality (stabbing, sharp, aching)
 - c. R = radiating
 - d. S = severity (e.g., on a scale of 1-10, how bad is your pain with 10 being the worst imaginable pain?)
 - e. T = timing
- B. Complete physical and neurological examination³³
 - 1. Patient's report is vital (pain diaries)
- C. Assessment tools^{33,34}
 - 1. Visual Rating Scale, Numerical Rating Scale, Verbal Descriptor Scale, FACES Rating Scale
 - a. Can be used in patients with mild cognitive impairment
 - 2. McGill Pain Questionnaire, Brief Pain Inventory
 - a. More detailed information about pain and its provoking factors and more time-intensive to complete
 - 3. Severe cognitive impairment: PAIN-AD, behavioral changes in patient, nonverbal cues

XVII. Pain treatment – non-pharmacologic options³²⁻³⁷

- A. Physical and occupational therapy
- B. Exercise
- C. Patient and caregiver education
- D. Weight reduction (if overweight)
- E. Assistive devices
 - 1. Footwear and other structural modifications
- F. Transcutaneous electric nerve stimulation (TENS)
- G. Hot/cold modalities
- H. Massage/acupuncture
- I. Informal cognitive strategies
 - 1. Social gatherings, visiting family/friends, music, prayer, humor, meditation, relaxation

XVIII. Pain treatment – non-opioid analgesics³²⁻³⁸

- A. Topical agents
 - 1. Capsaicin, topical NSAIDs, lidocaine
 - a. Often overlooked; good for small joint pain, such as hands or knee

- b. Advise patients not to touch near their eyes with this medication still on their fingers; may use gloves to help apply
- B. Acetaminophen (APAP)
 - 1. Usually the preferred pain medication in older adults due to tolerable safety profile
 - 2. FDA recommends no more than 4 g/day if the patient is managed by a physician and no more than 3 g/day if they are self-treating
- C. NSAIDs
 - 1. Good evidence for helping in OA pain and strongly recommended in ACR guidelines but must weigh the risks and benefits for these medications based on patient factors³⁸
 - 2. Not ideal for patients with renal insufficiency and can worsen kidney function, especially in older adults; also has warning for increasing risk of stroke and MIs, as well as increased risk of GI bleeds and ulcerations
 - a. COX-2 inhibitors less of a risk of causing a GI bleed than other NSAIDs but still a risk for CV events and renal dysfunction
- D. Corticosteroids
 - 1. Oral and intra-articular (IA) injections
 - a. IA injections can have systemic effects in older adults
- E. Other adjunct options
 - 1. IA hyaluronic acid, skeletal muscle relaxants, serotonin-norepinephrine reuptake inhibitors (SNRIs), anticonvulsants, cannabinoids

XIX. Pain treatment – opioid analgesics (selected list)³²⁻³⁷

- A. Tramadol
 - 1. Weak opioid (morphine potency of 10:1)
 - 2. Lowers the seizure threshold and can have serotonergic effects
- B. Hydrocodone
 - 1. Commonly combined with APAP or ibuprofen
 - 2. Use of hydrocodone has decreased due to scheduling it as a CII
 - 3. Morphine potency of 1:1
- C. Codeine (in form of APAP/codeine)
 - 1. Genetic variability can contribute to efficacy of this medication
 - a. Ultra-rapid metabolizers for CYP450 2D6 may have a failure of therapy and be prone to higher rates of adverse effects, including respiratory depression and even death
 - b. Poor metabolizers cannot convert codeine and have minimal response to medication

- c. People who are of European, North African, Asian, or Middle Eastern descent often most affected
- 2. Shorter-acting medication
- D. Morphine
 - 1. Both immediate-release and extended-release options available
 - 2. Can accumulate in renal dysfunction; be cautious in this population
- E. Oxycodone
 - 1. Both immediate-release and extended-release options available
- F. Methadone
 - 1. Use cautiously in the older adult population because it has a very long half-life
 - 2. Potential for QTc prolongation – be mindful of other QTc prolonging medications patient may already be taking
 - 3. Highly protein-bound, therefore free-fraction of drug may be elevated in the older adult with low albumin/nutritional issues
- G. Fentanyl
 - 1. Should never be used in opioid-naïve patients
 - 2. Use cautiously, especially the patch version
 - a. Skin changes with age, so older adults get inconsistent or rapid absorption with the fentanyl patch
- H. Hydromorphone
 - 1. One of the stronger opioids available, needs to be used with caution
 - 2. Some renal considerations with this medication, so may need to initiate at 25-50% of target dose depending on renal impairment

XX. Monitoring/cautions – pain

- A. Adverse reactions/side effects^{32-35,38}
 - 1. Age-related changes
 - a. Multiple dosage forms available → oral route usually preferred
 - 1) Try to avoid creams or patches, if possible, due to unpredictable systemic absorption in some patients
 - b. Due to increased total body fat as one ages, the half-life of lipid-soluble medications is increased and may build up in older adults
 - 2. NSAIDs
 - a. US Boxed Warnings for increased CV events and GI bleeds/ulcers

- b. Caution in renal insufficiency and worsening of renal function
- 3. Opioids
 - a. Gain tolerance versus persistent side effects
 - 1) Never gain tolerance to constipation, yet should gain tolerance to sedation, respiratory depression, dizziness
 - b. Long-term consequences of opioid therapy
 - 1) Can change receptors in body → can lead to immunosuppression, lower testosterone levels, and decreased BMD

XXI. Pain – guidance for treatment in older adults

- A. American Geriatric Society (AGS) Step-wise Approach³²
 - 1. Published in 2009
 - 2. Start with APAP ± NSAIDs/COX-2 inhibitor
 - a. Add in NSAID only if APAP is not fully effective
 - 3. Opioid therapy for moderate to severe pain that leads to functional impairment and/or diminished quality of life
 - a. Preferred opioid for chronic pain: scheduled, long-acting opioid
 - 4. Continuous pain treated with around-the-clock, long-acting medications
 - 5. Use adjunct therapy on case-by-case basis
 - a. Muscle relaxant or steroids
- B. 2019 ACR/Arthritis Foundation Guidelines for Management of Osteoarthritis of the Hand, Hip, and Knee³⁷
 - 1. Knee: strong recommendations for oral NSAIDs, topical NSAIDs, and IA steroids with conditional recommendations for APAP, tramadol, duloxetine, and topical capsaicin
 - 2. Hip: strong recommendations for oral NSAIDs and IA steroids with conditional recommendations for APAP, tramadol, and duloxetine
 - 3. Hand: strong recommendations for oral NSAIDs with conditional recommendations for topical NSAIDs, IA steroids, APAP, tramadol, duloxetine, and chondroitin
- C. Centers for Disease Control (CDC) Guideline for Prescribing Opioids for Chronic Pain³⁵
 - 1. Start with immediate-release opioids and avoid long-acting agents, methadone, and transdermal fentanyl
 - a. Caution in ≥ 50 MME/day and avoid ≥ 90 MME/day due to risk of adverse effects
 - b. Avoid benzodiazepines and opioids concurrently
- D. 2019 AGS Beers Criteria – Table 5³⁹
 - 1. Avoid opioids and certain combinations

- a. Benzodiazepines
- b. Gabapentin, pregabalin

Question 6:

After changing RH's pain medication regimen, it is noted that RH has decreased bowel sounds and complains of some bloating. Nursing reports her last bowel movement (last night) was large and hard. RH is complaining of increased straining during bowel movements.

Which of the following would be an appropriate bowel regimen for RH?

- A. Magnesium hydroxide (400 mg/5 mL) 15 mL orally every 4 hours
- B. Mineral oil 45 mL orally daily at bedtime
- C. Lubiprostone 24 mcg orally twice daily
- D. Polyethylene glycol 3350 17 g in 8 oz of water orally once daily

XXII. Constipation

- A. High prevalence in older adults^{40,41}
 - 1. Comorbidities, medications, functional status, age-related changes
 - a. Long-term care centers see a higher incidence due to low functional status of most patients
 - b. GI transit slows as you age, leading to more chronic constipation
 - 2. Symptom diagnosis versus Rome IV criteria
 - a. Rome IV criteria: functional constipation like irritable bowel syndrome (IBS), specific symptoms for at least 6 months
- B. Primary constipation⁴⁰⁻⁴²
 - 1. More common in younger adult populations
 - 2. Slow-transit constipation
 - 3. Defecation disorders
 - 4. Constipation-predominant IBS

XXIII. Secondary constipation^{40,41,43}

- A. More common in the older adult population
- B. Medical disorders/diseases
 - 1. GI, neurological, cardiac, endocrine/metabolic
- C. Medications
 - 1. Analgesics, antacids, anticholinergics, antidepressants, calcium channel blockers, diuretics, anticonvulsants, calcium, iron
- D. Lifestyle issues
 - 1. Sedentary, dehydration, diet, ignoring the urge to defecate, travel

XXIV. Constipation treatment⁴⁰⁻⁴⁴

A. Non-pharmacologic therapy

1. Address any secondary causes
 - a. Optimize medications and treatment of disease states contributing to constipation
2. Increase fiber in diet and fluids
3. Exercise → when you move, your gut moves
 - a. However, evidence has shown to have little benefit in most older adults, especially those living in long-term care facilities⁴⁴
4. Biofeedback, such as pelvic floor exercises can help to retrain anal muscles for effective defecation for patients who are mentally and physically able to participate in therapy⁴⁴
5. Use of devices to assist with squatting position for defecation
 - a. Makes it mechanically easier to evacuate bowels

B. Stool softeners

1. Docusate calcium and docusate sodium
 - a. Increased risk of fecal incontinence, especially if used alone

C. Laxatives

1. Preferred: osmotic laxatives, stimulant laxatives
 - a. Preferred scheduled osmotic laxatives are polyethylene glycol and lactulose
 - 1) Magnesium salts and sorbitol are rapid acting and usually reserved for PRN use
 - b. Stimulant laxatives include senna and bisacodyl
 - 1) While stimulant laxatives were cautioned to be used sparingly in the past due to the concerns for increasing the risk of cathartic colon, this risk was determined to be low and most patients do not develop long-term dependence on these medications
2. Caution using bulk-forming agents due to risk of impaction
 - a. These agents include psyllium and methylcellulose
 - b. May take several days to have an effect and requires patients to drink plenty of fluids (usually at least 8 ounces of water) to ensure that dehydration and impaction do not occur
 - c. However, due to age-related decreases in total body water, older adults are at an increased risk of adverse effects from bulk-forming laxatives, as well as most older adults do not drink enough fluids throughout the day, which increases the risk of impaction when using this type of laxative

D. Prokinetic agents

1. Reserved for IBS but can be used for secondary constipation
2. Chloride-channel activators, such as lubiprostone

3. Guanylate cyclase-C agonist, such as linaclotide and plecanatide
4. Serotonin 5-HT₄ receptor agonists, such as prucalopride
- E. Enemas/suppositories
 1. Usually not first-line since rectal route of administration is often uncomfortable, and can be difficult to self-administer rectal suppositories → most often used for impaction
 2. Soap enemas are no longer recommended

XXV. Opioid-induced constipation^{33,43,45}

- A. Non-pharmacologic treatments include increased water and fiber intake, increased exercise/active lifestyle
- B. First-line treatment is laxatives → osmotic, stimulant/stool softener, lubricant
- C. If patient is still having constipation after at least 1 week of treatment based upon the Bowel Function Index (BFI) score of equal to or greater than 30 points, then can try a peripheral-acting mu-opioid receptor antagonist
 1. Naldemedine, naloxegol, methylnaltrexone
- D. Reassess patients every two weeks for worsening of constipation
- E. AGA has no recommendation for the use of lubiprostone or prucalopride → not enough evidence⁴⁵

Question 7:

RH has been at your facility for one week now. She continues to progress in therapy WBAT with her right lower extremity. During your weekly interdisciplinary meeting, it is mentioned that RH continues on enoxaparin for deep venous thrombosis (DVT) prophylaxis at the facility since her hip fracture repair surgery at the hospital.

What is the minimum recommended duration of DVT prophylaxis for RH?

- A. 7 days
- B. 14 days
- C. 6 weeks
- D. 6 months

XXVI. DVT prophylaxis⁴⁶⁻⁴⁸

- A. American College of Chest Physicians (ACCP) guidelines^{46,47}
 1. Total hip arthroplasty (THA), total knee arthroplasty (TKA), and hip fracture surgery (HFS)
 - a. Minimum 10-14 days with extended thromboprophylaxis in outpatient period for up to 35 days
- B. Scottish Intercollegiate Guidelines Network (SIGN) guidelines
 1. THA and TKA
 - a. Extended thromboprophylaxis preferred, yet no specifics given
 2. HFS

- a. Duration of up to 4 weeks
- C. American Association of Orthopaedic Surgery (AAOS) guidelines
 - 1. THA, TKA, and HFS
 - a. Up to a physician's discretion
- D. National Institute for Health and Clinical Excellence (NICE) guidelines
 - 1. TKA
 - a. ≥ 14 day
 - 2. THA
 - a. >14 days for newer agents
 - 3. HFS
 - a. 1 month

XXVII. Duration of DVT prophylaxis

- A. Wells, et al. (2010)⁴⁹
 - 1. Extended duration (>14 days) associated with lower incidence venous thromboembolism (VTE) and lower bleeding events in THA and TKA
- B. Forster, et al. (2016)⁵⁰
 - 1. Extended duration (>14 days) recommended for THA but not enough evidence to assess for TKA or HFS
- C. Additional considerations
 - 1. Age, type of procedure, comorbidities, functional status/frailty, fall risk, co-medications
 - a. Example: THA may need a longer prophylaxis period than a TKA
 - b. Patients had a higher risk of bleeding (e.g., older age, history of falls, very frail) may benefit from a shorter duration of therapy
 - c. Co-medications: if the patient is already on blood thinners, such as an antiplatelet agent, may consider a shorter duration of prophylaxis³⁹

Question 8:

RH has been at the facility for about four weeks and you are conducting the monthly chart review. She has been slowly progressing in therapy and is doing well. It is determined that RH would benefit from two more weeks of therapy services before being discharged home.

During a recent chat with the social worker, RH stated her anxiety is better controlled than it was before her hospitalization, she is becoming more confident as she improves in therapy, and she is looking forward to going home soon.

Since RH seems to be responding well to her selective serotonin reuptake inhibitor (SSRI) therapy, what would be the most clinically appropriate next step in addressing her anxiety?

- A. Slowly taper down the dose of alprazolam by no more than 25% every 1-2 weeks until medication is discontinued.
- B. Discontinue alprazolam immediately to prevent any further potential side effects from benzodiazepine use.
- C. Change alprazolam to a longer-acting benzodiazepine, such as diazepam, to prevent withdrawal and then slowly taper the dosage before discontinuing the medication.
- D. Switch alprazolam to lorazepam since it is a preferred benzodiazepine in the older adult population and continue medication.

XXVIII. Anxiety⁵¹⁻⁵³

- A. First-line pharmacotherapy includes SSRIs and SNRIs
 - 1. Avoid hydroxyzine
 - a. Highly anticholinergic and can increase risk of falls and sedation
- B. Buspirone
 - 1. Can be used for generalized anxiety disorder in the older adult population, yet caution use due to length of time to see an effect (2-4 weeks) and most patients that have been exposed to benzodiazepines in the past have a decreased response to buspirone
 - 2. Does not have risk of sedation, increased tolerance, or respiratory depression
- C. May need to initiate a benzodiazepine bridge for 2 to 6 weeks during initiation of antidepressant⁵¹⁻⁵⁵
 - 1. Lorazepam (0.5-2 mg/day)
 - 2. Oxazepam (10-30 mg/day)
 - 3. Benzodiazepines have been shown to be efficacious and safe if used as a short-term bridge for older patients who need relief from anxiety symptoms while awaiting a response to antidepressants⁵²
 - 4. Can schedule benzodiazepine during this bridge time but make sure to slowly taper off when time comes to discontinue medication

XXIX. Monitoring – anxiety⁵¹⁻⁵³

- A. Adverse reactions/side effects of agent
 - 1. SSRIs: electrolytes, extrapyramidal symptoms, increased bleeding risk, serotonin syndrome,

fractures, sexual disturbances, weight fluctuations, sleep abnormalities, GI issues, falls

- a. Especially need to monitor for hyponatremia
- 2. SNRIs: similar to SSRIs, elevated blood pressure, giddiness, insomnia
- 3. Benzodiazepines: falls, sedation, respiratory depression, cognitive impairment, abuse/dependence, paradoxical agitation
- B. Duration of antidepressant therapy: at least one year
 - 1. Some may need lifelong therapy

XXX. Benzodiazepine taper

- A. Reassess by 4-6 weeks of therapy⁵¹⁻⁵⁶
 - 1. Approach should be individualized for positive patient outcomes⁵³⁻⁵⁵
- B. Switch patients on multiple benzodiazepines to one drug⁵²⁻⁵⁵
- C. Outcomes have not been shown to improve if treatment switched from one benzodiazepine to another benzodiazepine⁵⁴⁻⁵⁵
 - 1. Can consider switching to long half-life drug (clonazepam) since the mechanism of action would help to slowly taper off the benzodiazepine due to the longer half-life
- D. Use scheduled rather than PRN doses
- E. Tannenbaum, et al. (2014) – EMPOWER trial⁵⁶
 - 1. Direct-to-consumer education successfully leads to discussions to stop or reduce medication
 - 2. In intervention group, 62% initiated conversation about benzodiazepine therapy cessation with physician and/or pharmacist
 - a. At 6 months, 27% in intervention group discontinued benzodiazepine use compared with 5% of control group (risk difference, 23% [95% CI, 14%-32]; number needed to treat, 4).
 - b. Dose reduction occurred in an additional 11% (95% CI, 6%-16%)
 - c. In multivariate subgroup analyses, >80 years of age, sex, duration of use, indication for use, dose, previous attempt to taper, and concomitant polypharmacy (10 drugs or more per day) did not have a significant interaction effect with benzodiazepine therapy discontinuation
- F. Traditional taper: decrease by 25% of dose every 1-2 weeks until at 20% of original dose then a slower taper of 12.5% every 2 weeks near the end⁵⁴⁻⁵⁵
 - 1. Alternate strategies: change to once-daily medication and taper over 4 weeks or decrease by 10% every 1-2 weeks⁵²⁻⁵⁵
 - 2. Slow tapers have been found to be more successful than fast ones
- G. Caution/obstacle: withdrawal symptoms⁵²⁻⁵⁵
 - 1. Need to be most cautious of withdrawal symptoms, especially with older adults
 - a. Can consider adding anticonvulsants to help to mitigate these effects

2. Go slowly at end of taper to prevent symptoms
- H. Some may need to continue benzodiazepine lifelong if taper fails
1. Withdrawal typically occurs within the first 30 days of taper

Question 9:

Several days later, the nurses note RH has been a little sluggish and during the weekly interdisciplinary SNF meeting, the therapist states RH's gait has been more unsteady than past weeks.

The physician draws labs to look for abnormalities or infection – resulting labs include:

127	98	18	100
4.0	28	1.1	

6	11.2	247
	32.3	

TSH: 3.32 uIU/mL

Which of the following medications is most likely contributing to RH's hyponatremia?

- A. Cetirizine
- B. Citalopram
- C. Glipizide
- D. Verapamil

XXXI. Hyponatremia

- A. Age-related changes⁵⁷
 1. Kidneys don't reabsorb electrolytes as well
 2. Incidence of hyponatremia increases with age, as well as place of living
 - a. Health care settings, such as nursing homes, can have a high incidence of hyponatremia with up to 18% of the nursing home residents having low sodium levels of <135 mmol/L and up to half of all patients having at least one incidence of hyponatremia in a 1-year span⁵⁸
- B. Hypervolemic versus hypovolemic versus euvolemic⁵⁷
 1. Hypervolemic: fluid overloaded
 2. Hypovolemic: usually drug-induced or caused by disease or medical condition
 3. Euvolemic: most common presentation of drug-induced hyponatremia (i.e., SIADH)
- C. SIADH: antidiuretic hormone (ADH)-induced retention of ingested or infused water^{57,59}
 1. Serum Na <135 mEq/L
 2. Serum osmolality <280 mOsm/kg
 3. Urine Na >20 mEq/L
 4. Urine osmolality >150 mOsm/kg

XXXII. Causes of hyponatremia

A. Drug-induced causes^{57,59-60}

1. Diuretics
 - a. Thiazide diuretics → hypovolemic hyponatremia
 - b. Loop diuretics → SIADH
2. Antidepressants (SSRIs, SNRIs), antipsychotics, anticonvulsants, benzodiazepines
3. Antineoplastics, hormones
 - a. Less commonly associated: analgesics, dopamine agonists, clonidine, angiotensin converting enzyme (ACE) inhibitors, amiodarone, theophylline

B. Disease/disorder-induced causes⁵⁷

1. Congestive heart failure, cirrhosis, excessive hydration/overload
2. Low sodium intake, central nervous system (CNS) disorders, intracranial bleeding, infection (pulmonary), malignancies, hormone deficiencies, symptomatic HIV infection
3. “Tea and toast” hyponatremia
 - a. Phenomena seen in older adults with renal dysfunction and decreased GFR where the diet is low in sodium and protein but high in water consumption, leading to excess renal water excretion capacity⁵⁸

Question 10:

After discontinuing the offending agent, which of the following would be the next appropriate clinical step in addressing RH’s SIADH?

- A. Begin tolvaptan 15 mg orally once daily for 30 days.
- B. Bolus 500-mL IV of hypertonic (3%) saline.
- C. Restrict fluid intake to 800-1000 mL daily for 3-5 days.
- D. Initiate demeclocycline 600 mg orally twice daily until sodium level within normal limits.

XXXIII. SIADH⁵⁷⁻⁵⁹

- A. To first treat SIADH, one must identify any underlying causes:
 1. Volume status
 2. Medication review
 3. Disease/disorder
- B. Once these have been identified, correct for any volume abnormalities, discontinue any offending agents, and/or treat disease/disorder identified
- C. Treatment for SIADH must take into consideration the following:
 1. Symptoms (severity, co-morbidities)
 2. Prevention of complications
 3. Reduction in mortality

- D. Do not want to correct sodium too quickly due to the risk of cerebral edema or osmotic demyelination syndrome
 - 1. Correct no more than 6-12 mEq/L within the first 24 hours, with the more conservative approach being to correct no more than 10 mEq/L in a 24-hour period⁵⁷⁻⁵⁹
- E. For mild-moderate SIADH
 - 1. Fluid restriction should be tried first since it is safe, cost-effective, and efficacious
 - 2. If fluid restriction fails, the following can be tried:
 - a. Increase sodium intake \pm loop diuretic
 - 1) Can be through diet or through sodium chloride tablets
 - b. Demeclocycline/lithium
 - 1) Causes water excretion by acting on collecting tubules on kidneys
 - c. Urea
 - 1) Fairly well tolerated and can be safe if needed for chronic use
 - d. Vasopressin receptor antagonists – tolvaptan, conivaptan
 - 1) Usually last line
- F. For severe SIADH
 - 1. Vasopressin receptor antagonists – tolvaptan, conivaptan
 - 2. Saline infusion (hypertonic 3%)
 - a. Reserved for severe, symptomatic, or resistant cases, and use cautiously since it can correct sodium too quickly unless titrated appropriately

XXXIV. Antidepressant-induced SIADH

- A. Patient risk factors⁵⁸⁻⁶⁰
 - 1. Demographic, comorbidities, medications
 - a. High risk: older age, female, low body mass, heart failure, malignancy, liver disease
- B. Worst offenders tend to be SSRIs/SNRIs⁵⁹⁻⁶⁰
 - 1. Coupland et al. (2011)⁶¹
 - a. Found worst outcomes with citalopram, escitalopram, and fluoxetine
- C. Other antidepressants also carry risks^{58-59, 62}
 - 1. Tricyclic antidepressants (TCAs), mirtazapine, bupropion, monoamine oxidase inhibitors (MAOIs), trazodone
- D. Discontinue offending agent⁵⁹⁻⁶⁰
 - 1. Decreasing dose may help, yet best to discontinue agent immediately to avoid complications

- E. Avoid re-challenging patient with offending agent⁵⁹⁻⁶⁰
 - 1. Caution switching to another agent in the same class
- F. Choose agent with lower risk of SIADH⁶¹⁻⁶²
 - 1. Good idea to use a different class of medications with a lower risk
 - 2. Mirtazapine, bupropion, and trazodone are better options
 - a. Could also consider TCAs but watch for adverse effects in older adults
- G. Use clinical judgment and close monitoring⁵⁹

Question 11:

About a week later, RH loses her balance while transferring to the toilet, but the occupational therapist was able to catch her and lower her to the ground safely with no issues noted.

What is the most clinically appropriate intervention to help prevent falls for RH in the future when she is back at home?

- A. Encourage use of anti-slip footwear devices at all times.
- B. Initiate a calcium supplement to help decrease risk of fractures.
- C. Recommend use of an assistive mobility device, such as a cane or walker.
- D. Conduct a home hazards assessment by an occupational therapist.

XXXV. Assessment – falls⁶³⁻⁶⁶

- A. During annual assessment, if a patient reports two or more falls in the past 6 to 12 months, any fall resulting in injury, difficulty with balance/gait, or fear of falling – then assess the following areas:
 - 1. Syncope
 - 2. Gait or mobility problems
 - 3. Vision impairment
 - a. Especially cataracts
 - 4. Cognitive impairment
 - 5. Postural hypotension
 - 6. Polypharmacy or high-risk medications
 - a. Literature has shown the number of medications a patient is on is positively correlated with the number of falls
 - 7. Environmental hazards
 - 8. Vitamin D deficiency
 - a. Can lead to weakness, which leads to more falls
- B. Comprehensive physical assessment is necessary to completely work-up the patient's problem
 - 1. Vitals/laboratory evaluations
 - 2. Balance

- a. Romberg test
- 3. Gait
 - a. Timed Up and Go (TUG) Test
- C. Complete medication review
 - 1. Fall risk medications
 - a. Selected examples: non-selective medications (e.g., non-selective alpha blockers), anticholinergics, antidiabetics, diuretics, laxatives, opioids, medications that act on the CNS

XXXVI. Prevention – falls (community-dwelling)^{63-43,66-69}

- A. Exercise program with focus on balance and muscle-strength training
- B. Multifactorial/multicomponent interventions
 - 1. Minimize high-risk medications and decrease number of medications
 - 2. Treat vision impairment, specifically cataract surgery
 - 3. Manage postural hypotension
 - 4. Address heart rate/rhythm abnormalities with pacemaker placement
 - 5. Initiate vitamin D supplementation in deficient and high-risk patients
 - 6. Ensure proper footwear in icy conditions or with disease-specific issues
 - 7. Manage urinary incontinence issues
 - 8. Modify home environment with home hazards assessment done by occupational therapist
 - 9. Provide education and information
 - a. Particularly education about going into different environments
 - 1) Example: Many older adults fall in parking lots
- C. No evidence for support: vitamin D supplementation with no known deficiency, assistive devices, nutritional supplementation, hip protectors

XXXVII. Prevention – falls^{64,66,68}

- A. Long-term care
 - 1. Multifactorial/multicomponent interventions
 - a. Tailor to long-term care environment
 - 2. Exercise programs should be used with caution
 - a. Even though patients get stronger, they can still fall → “just strong enough to fall”
 - 3. Vitamin D supplements for proven or suspected insufficiency, patients who have abnormal gait or balance, or those who are otherwise at increased risk for falls

4. Avoid physical restraints, yet chair and bed alarms may help alert staff to unsafe behaviors
- B. Cognitive impairment and falls
1. Insufficient evidence to show any interventions are helpful to prevent falls in patients with cognitive impairment
 2. It is an independent risk factor for falls

Question 12:

After six weeks at the SNF, RH is walking up to 300 feet with a cane and can dress, bathe, and toilet herself independently. It is determined that RH has progressed to her baseline and is ready to “graduate” from therapy and be discharged back home with her family.

Upon pre-discharge counseling for her medications, RH expresses some concerns about affording her medications once she is back home. She explains, “money is tight” since her granddaughter’s husband moved back home with them and he “borrows” money from her often. She quickly excuses the behavior and says he just needs to “let off some steam” since he was laid off his job several months ago. RH explains as the only male in the household, it is his obligation to do what he wants with the money and he can get very upset when questioned about it.

After you and the nurse hear this, you have some concerns about the financial status of RH when she goes back home.

Based on your concerns, what should the next step be for addressing the situation?

- A. Report your findings to the Elder Abuse/Tribal Hotline immediately.
- B. Call RH’s bank and explain the situation so they can investigate misappropriated funds.
- C. Continue to monitor the situation but do not report anything until you have concrete evidence of wrongdoing.
- D. Speak directly to her granddaughter’s husband about the situation and warn him you may report the situation to the local authorities if this issue continues.

XXXVIII. Elder abuse/neglect⁷⁰⁻⁷³

- A. 1 in 10 older people will face some form of abuse or neglect
 1. Important to be cognizant of this as providers
- B. Neglect
 1. Self-neglect: hoarding, personal hygiene, unsanitary conditions, inadequate utilities, house needs repairs
- C. Abuse
 1. Physical, emotional, fiduciary/financial, sexual
 - a. Emotional abuse can be verbal or non-verbal
 - b. Financial abuse can be afflicted by an individual or an organization
- D. Exploitation
 1. Inappropriate use of someone’s resources for personal gain
- E. Abandonment

1. Withdrawal of care services or companionship

XXXIX. Risk factors for elder abuse/neglect^{70-71,73}

- A. Advanced age
- B. Female
- C. Low income
- D. Limited education
- E. Minority status
- F. Functional/cognitive impairment
- G. Social isolation → predictor of having self-neglect
- H. Caregiver stress/deficits
- I. History of family violence/abuse
- J. Poor family dynamics
- K. Alcohol/substance abuse in home

XL. Warning signs of elder abuse/neglect^{70-71,73}

- A. Weight loss, poor hygiene
- B. Unattended medical needs
- C. Over- or under-medicated
- D. Sudden changes in financials
- E. Sudden change in prescription refilling
- F. Bruises, pressure marks
- G. Unexplained withdrawal/isolation
- H. Hypervigilance
- I. Observation of verbal abuse, belittling, treating like a child
- J. Older adult not allowed to answer questions or speak
- K. Bottom line: If something seems “off,” there probably is something going on

XLI. Elder abuse/neglect

- A. Intentional versus unintentional⁷⁰
 1. Cultural differences
- B. Screening tools⁷⁰⁻⁷⁵

1. Elder Assessment Instrument (EAI), Vulnerability to Abuse Screening Scale (VASS), Brief Abuse Screen for the Elderly (BASE), Texas Self-Neglect Scale
 2. No true gold standard in terms of screening for elder abuse
 3. Ideal screening tool should be concise, easy to use, account for the older person's health and social vulnerabilities, and outline a referral pathway
- C. Challenges for reporting⁷¹
1. Impact on patient
 2. Lack of evidence or proof
 3. Fear of getting involved

XLII. Elder abuse/neglect resources^{69,72-73,76}

- A. Mandatory reporting in most states for most healthcare professionals
1. Many states don't include pharmacists, even though pharmacists are usually able to catch these warning signs
 2. Need reasonable cause, not proof or evidence
 3. Confidential, anonymous reporting
- B. Adult Protective Services (APS)
1. Usually follow up within 24 hours
- C. National Center on Elder Abuse (NCEA)⁷⁶
1. <https://ncea.acl.gov/>
- D. National Indigenous Elder Justice Initiative (NIEJI)⁷⁷
1. www.nieji.org/hotlines
 - a. Has hotlines specific for different tribes

SELF-ASSESSMENT QUESTION ANSWER KEY

1. **Correct Answer = C. Aspirin, famotidine, quetiapine**

RH is on enoxaparin, and she doesn't need to be on aspirin and enoxaparin concurrently since there is no indication and due to increased bleeding risk and duplication of therapy. She doesn't have a history of GERD, so the famotidine needs to be readdressed. RH has no signs of delirium, so she likely doesn't need to be on quetiapine. However, the patient does have anxiety for which she is prescribed citalopram. Answer choice C is the only answer choice that does not include citalopram.

(BCGP Content Outline: 2.B.H, 3.B.A, 3.C.K)

2. **Correct answer = D. Zoledronic acid 5 mg intravenously over 15 minutes every year**

Alendronate and zoledronic acid are first-line agents to treat osteoporosis, but alendronate 35 mg orally once weekly is actually the prevention dose for osteopenia. Calcitonin is not first-line for osteoporosis treatment, since it is correlated with an increased risk of malignancies. Ibandronate only has evidence for vertebral fractures but not hip or non-vertebral fractures, making it the less favorable bisphosphonate in its class. Zoledronic acid 5 mg IV over 15 min/year is going to be the treatment dose.

(BCGP Content Outline: 2.L.L, 3.E.D)

3. **Correct answer = C. 2 years**

Four weeks and six months wouldn't be long enough to see a change in bone density. Usually change on DXA is not visualized until at least a year. Ten years would be too long and it is important to follow up sooner to see if bone density change has occurred or therapy should be altered.

(BCGP Content Outline: 2.O.X, 3.I.G)

4. **Correct Answer = B. Measure serum vitamin B₁₂ level to check for pernicious anemia.**

Answer choice A is too aggressive a treatment since her hemoglobin is not critically low, and the most important first step would be to determine the cause of RH's anemia. Answer choice C is not a good choice since she does not have any signs of a GI bleed, so a fecal occult blood test is not necessary. In terms of starting ferrous sulfate, usually iron-deficiency anemia is typically a microcytic anemia, so a low MCV would be observed, instead of an elevated MCV, as in RH's labs. Vitamin B₁₂ deficiency is a macrocytic anemia and could be seen if a patient presents with an elevated MCV.

(BCGP Content Outline: 2.C.A, 2.L.G)

5. Correct answer = A. Increased risk of cardiovascular events

NSAIDs have two US Boxed Warnings, including increasing the risk of CV events and causing serious GI bleeding. NSAIDs are associated with a higher incidence of serious CV thrombotic events, including myocardial infarctions and stroke. The risk may occur early in treatment and may increase with duration of use. These medications are not linked with increased risk of suicide or life-threatening serious rashes. NSAIDs are not associated with an increased risk of addiction, abuse or misuse, unlike opioid therapy.

(BCGP Content Outline: 2.A.M, 2.B.O)

6. Correct Answer = D. Polyethylene glycol 3350 17 g in 8 oz of water orally once daily

Magnesium hydroxide is not patient-friendly or well-tolerated option due to its quick onset and adverse effects, as well as frequent doses. Mineral oil is also not recommended orally due to the risk for aspiration and lipoid pneumonia. Lubiprostone is a chloride-channel activator and is not considered a first-line recommendation for constipation in the older adult population. It should be used after other laxatives have been tried. Reserve lubiprostone for last-line therapy. Polyethylene glycol is an osmotic laxative and is recommended in older adults to help with loosening stool and propelling it down the intestines. It is fairly well tolerated in most older adults and is considered first-line therapy in constipation in older adults.

(BCGP Content Outline: 2.L.L)

7. Correct Answer = B. 14 days

The correct answer is 14 days. Seven days would be too short and 6 weeks or more would be too long and put the patient at risk for a bleed. The general recommendations for duration of post-operative VTE prophylaxis is at least 10 to 14 days and up to 35 days, depending on patient specific factors and type of surgery.

(BCGP Content Outline: 2.L.L, 3.I.D)

8. Correct answer = A. Slowly taper down the dose of alprazolam by no more than 25% every 1-2 weeks until medication is discontinued.

Once a patient is therapeutic with an antidepressant for anxiety, it is important to try to taper off the benzodiazepine bridge. Switching to a preferred benzodiazepine for older adults is not a good option since it still carries the risk of adverse effects, including falls, sedation, and confusion. One risks the chance of withdrawal if immediate discontinuation occurs, making answer choice B a poor option. It is important to taper the dose by about 25% every 1-2 weeks until it is completed.

(BCGP Content Outline: 2.B.L, 2.L.G, 2.M.P)

9. Correct Answer = B. Citalopram

SSRIs, such as citalopram, are a common cause of hyponatremia in the older adult population. None of the other listed agents are commonly associated with hyponatremia.

(BCGP Content Outline: 2.L.D, 2.M.M, 3.Y.K)

10. Correct Answer = C. Restrict fluid intake to 800-1000 mL daily for 3-5 days.

Tolvaptan can be used for moderate hyponatremia but is not recommended to be used first-line. In addition, tolvaptan and hypertonic saline would be too aggressive at this point in time. Demeclocycline is an acceptable choice to use in patients with moderate hyponatremia but not first-line. First-line and safest to try would be to start with fluid intake restriction.

(BCGP Content Outline: 2.L.L, 3.Y.K)

11. Correct Answer = D. Conduct a home hazards assessment by an occupational therapist.

If a patient has a history of falls, it is important to conduct a home hazards assessment by an occupational therapist to see if there are many fall risks at home, such as clutter, loose throw rugs, cords/obstacles in the walking path, or lack of assistive devices in the bathroom. There is actually no evidence suggesting that a cane or walker prevents falls. Anti-slip footwear is only necessary in icy conditions and not recommend in day-to-day life. Lastly, vitamin D deficiency is associated with an increased risk of falls, not calcium, making answer choice B a poor option.

(BCGP Content Outline: 3.A.C, 3.Y.J)

12. Correct Answer = A. Report your findings to the Elder Abuse/Tribal Hotline immediately.

It could possibly be a violation of HIPAA to call the bank to investigate the missing funds. It may not be possible to continue to monitor the situation for the patient once they go home. Lastly, it may be dangerous to talk to the granddaughter's husband directly since RH mentions that he gets upset when questioned about money. If a healthcare provider suspects the patient is being abused, then it is imperative to contact an organization, such as APS or the Elder Abuse/Tribal Hotline, to investigate the matter further.

(BCGP Content Outline: 1.E.C, 1.H.F, 3.D.C)

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