2018
ASHP Clinical Skills Competition℠

NATIONAL COMPETITION CASE

Directions to National Clinical Skills Competition Participants

Identify the patient's acute and chronic medical and drug therapy problems. Recommend interventions to address the drug therapy problems using the forms supplied (Pharmacist's Patient Data Base and Pharmacist's Care Plan).

IMPORTANT NOTE: Only the **Pharmacist's Care Plan** will be used for evaluation purposes.

Using the patient's data you will be able to develop an effective care plan for your patient. Clearly define the health care problems. Health care problems include treatment of all acute and chronic medical problems, resolution of all actual or potential drug-related problems, and identification of any other health care services from which your patient may benefit.

Remember to think about potential medical problems for which your patient may be at risk and disease prevention and disease screening activities that may be appropriate to recommend. Also, don't forget to consider specific patient factors that may influence your goals and recommendations for therapy (e.g., physical, psychological, spiritual, social, economic, cultural, and environmental).

To complete your care plan, specify all of your patient's health care problems that need to be addressed. Then prioritize the problems into one of three categories: (1) Most urgent problem, (2) Other problems that must be addressed immediately (or during this clinical encounter), OR (3) Problems that can be addressed later (e.g. a week or more later/at discharge or next follow up visit). Please note that only one problem should be identified as the "most urgent problem."

Then **for each problem** describe the (1) therapeutic goals, (2) recommendations for therapy, and (3) monitoring parameters and endpoints. Your monitoring parameters should include the frequency of follow-up and endpoints should be measurable by clinical, laboratory, quality of life, and/or other defined parameters (e.g., target HDL is greater than 50 mg/dL within 6 months).

NATIONAL CASE

2018 ASHP CLINICAL SKILLS COMPETITION
PHARMACIST'S PATIENT DATA BASE FORM

Demographic and Administrative Information

Name: Leonard Jenkins	**Patient ID:** 007529
Sex: Male	**Room & Bed:** 6032-D (6A-Medicine)
Date of Birth: 09/28/80	**Physician:** Dr. Williams
Height: 68 in. / **Weight:** 136 lbs / **Race:** Caucasian	**Religion:** Catholic
Prescription Coverage Insurance: New York State Medicaid	**Pharmacy:** Walgreens
Copay: $1	**Annual Income:** $26,000

Chief Complaint: "My breathing has gotten worse over the past week, especially with activity."

History of Present Illness: LJ arrived in the emergency department at 1700 on 11/30/18 via a friend because he believes "his breathing has become very labored." LJ complains of shortness of breath on exertion and subjective fevers. He reports that his symptoms started approximately a week or two ago and have progressively gotten worse.

He says he just hasn't felt like himself over the past month. He also reports having multiple sex partners over the past 18 months. He prefers to not use protection and hasn't noticed any "signs" of a sexually transmitted infection. He states that he has woken up in the middle of the night with night sweats over the past few weeks, but figured it was just his new roommate "blasting the heat".

He presented to an urgent care center about a week ago due to his subjective fevers and shortness of breath. The urgent care provider prescribed him a "Z-Pak" and some steroids for a "respiratory infection". He reports that this did not help his symptoms at all, and he now feels worse.

In the ED, ceftriaxone and azithromycin were initiated for a suspected community-acquired pneumonia (CAP). The infectious diseases team was consulted given his history and progressive symptoms. The infectious diseases team was concerned for acute HIV infection and a potential opportunistic infection and ordered the appropriate diagnostic and laboratory tests for a workup.

Past Medical History

1. Hypertension
2. Gastroesophageal reflux disease (GERD)
3. Allergic rhinitis
4. G6PD deficiency

Outpatient Drug Therapy

Drug Name/Dose/Strength/Route	Prescribed Schedule	Duration Start–Stop Dates	Prescriber	Pharmacy
1. Lisinopril 10 mg PO	One tablet daily	09/10/2016 – Present	Dr. Williams (PCP)	Walgreens
2. Calcium carbonate 500 mg PO	One tablet twice daily with meals	02/22/2017 – Present	No prescriber (OTC)	Walgreens
3. Fluticasone 50 mcg intranasal	Two sprays in each nostril every morning	04/28/2017—Present	No prescriber (OTC)	Walgreens
4. Prednisone 20 mg PO	Two tablets daily x 5 days	11/23/2018 (no refills)	Dr. Andrews (Urgent Care)	Walgreens

5. Azithromycin 250 mg PO	Two tablets by mouth on day 1 followed by one tablet by mouth on days 2-5	11/23/2018 (no refills)	Dr. Andrews (Urgent Care)	Walgreens

Medication History
LJ reports that he takes all of his medications routinely and rarely misses doses. He has GERD and previously took calcium carbonate only on an as needed basis, but his symptoms persisted and he is now taking this routinely to have better control of his symptoms. He does admit that he enjoys spicy foods and notes that his symptoms are worse after, as well as sometimes at nighttime. He has allergic rhinitis, which has been controlled with daily fluticasone.

Allergies/Intolerances:
No known drug allergies

Surgical History
No past surgeries

Family History
Father died of myocardial infarction at age 68
Mother is alive and well
Brother, age 40, living with type 2 diabetes mellitus

Social History
Alcohol: drinks socially, 3-4 drinks per week
Tobacco: denies smoking or chewing
Illicit drugs: denies
Employment: elementary school guidance counselor
Marital status: single
Sexual history: multiple sex partners and engages in high-risk sexual behaviors

Vaccination history
Received all recommended childhood and adolescent immunizations through age 18 (hepatitis B, rotavirus, DTaP, Tdap, *Haemophilus influenzae* type b, pneumococcal, inactivated poliovirus, MMR, varicella, hepatitis A, meningococcal)
Other pertinent immunizations as noted:
Last Td booster: 08/17/07
Last influenza vaccine: 11/20/17

ROS
Positive for fever, dyspnea on exertion, dry cough, fatigue; denies headaches, chest pain, abdominal pain, or diarrhea

Physical Exam
General: appears in moderate distress
HEENT: PERRLA; painless, white plaques observed in the oral cavity; cervical lymphadenopathy
Chest: rales present bilaterally; tachypnea
Cardiovascular: negative JVD, no gallops/murmurs
Abdomen: positive bowel sounds
Genitourinary: WNL
Extremities: no edema present; capillary refill < 2 seconds; WNL
Neuro: AO x 3
Psych: normal

Vital signs
HR: 86 bpm
RR: 25 breaths/min
O2 Saturation: 84% room air
BP: 126/78 mmHg; repeat 128/76 mmHg
Temp: 38.4°C

Labs and Microbiology

	11/30/2018
Metabolic Panel	
Na (mEq/L)	135
K (mEq/L)	4.2
Cl (mEq/L)	101
CO_2 (mEq/L)	20
BUN (mg/dL)	12
SCr (mg/dL)	0.7
Glucose (mg/dL)	85
Calcium (mg/dL)	8.6
Phosphorus (mg/dL)	3.1
Magnesium (mg/dL)	1.6
Albumin (g/dL)	3.6
AST (IU/L)	22
ALT (IU/L)	34
Total bili (mg/dL)	1.3
CBC	
WBC (million/mm^3)	5.8
Hgb (g/dL)	17
Hct (%)	51
Plt (K/mm^3)	130
Fasting Lipid Panel	
Total cholesterol (mg/dL)	187
LDL (mg/dL)	93
HDL (mg/dL)	44
Triglycerides (mg/dL)	147
Urinalysis	
Clarity	Clear
Color	Yellow
Glucose	Negative
Hemoglobin	Negative
Ketone	Negative
Leukocyte esterase	Negative
Nitrite	Negative
Urine pH	7.0
Specific gravity	1.023
Protein	Negative
Epithelial cells per high-power field	8
WBC per high-power field	2

Other	
LDH (U/L)	761
PT (seconds)	12
INR	1.1
Room air arterial oxygen, pO2 (mmHg)	60
Alveolar-arterial O2 gradient (mmHg)	39
MRSA nares screening	Negative
CD4 absolute count	91
CD4 %	7
Toxoplasma gondii IgG	Positive
4th Generation HIV Ag/Ab	Reactive
HIV viral load (copies/mL)	84,827
HLAB*5701	Positive
Glucose-6-Phosphate Dehydrogenase (u/g Hb)	3.3 (deficient)
Hepatitis B surface antibody	Reactive
Hepatitis B core antibody	Nonreactive
Hepatitis B surface antigen	Nonreactive
Hepatitis A IgG	Reactive
Microbiology	
Expectorated sputum culture (collected 11/30 at 1930)	Gram stain: 3+ flora Culture: pending
Blood cultures x2 (collected 11/30 at 1930)	Pending
Direct fluorescent antibody (DFA) stain from induced sputum	Positive for *Pneumocystis jiroveci*

Tests

Chest X-ray: diffuse bilateral "ground-glass" interstitial opacifications

EKG: sinus rhythm; no ischemic changes; QTc= 440 ms

Current Drug Therapy

Drug Name/Dose/Strength/Route	**Prescribed Schedule and Administration**	**Start Date**	**Indication**
Ceftriaxone 1 gram IV	1 gram once daily (started at 2000)	11/30/18	Suspected CAP
Azithromycin 500 mg PO	500 mg once daily (started at 2000)	11/30/18	Suspected CAP
Lisinopril 10 mg PO	10 mg once daily (started at 0900)	12/01/18	Hypertension
Calcium carbonate 500 mg PO	500 mg twice daily (started at 0900)	12/01/18	GERD
Fluticasone 50 mcg intranasal	2 sprays in each nostril once daily (started at 0900)	12/01/18	Allergic rhinitis

Acetaminophen 500 mg PO	Every 6 hours as needed	11/30/18	Fever (≥ 38°C) and/or mild (pain scale 1-3) to moderate pain (pain scale 4-6)

Patient Narrative

LJ is admitted to the general medical floor based on his clinical presentation. His HIV antigen/antibody test was reactive, and he is now diagnosed with acute HIV infection. Based on his chest radiograph and clinical presentation, the infectious diseases team was concerned for *Pneumocystis jiroveci* pneumonia (PJP). They ordered an induced sputum and a DFA stain for PJP, which is positive for *Pneumocystis jiroveci*. The team also asked for a room air arterial oxygen level to determine his degree of hypoxia. On physical exam, white plaques were seen in his oral cavity without any esophageal pain or dysphagia. The infectious diseases physician diagnoses the patient with PJP, acute HIV infection, and oral candidiasis, and has provided counseling on these specific infectious-related issues. Blood cultures are negative at 24 hours and the sputum culture has grown commensal flora. Given the new HIV diagnosis, LJ is worried about compliance with a potential complex antiretroviral regimen.

The team asks you to review the patient's case and make recommendations for antibiotics, antiretrovirals, and any other suggestions regarding this patient's care.

Evaluated for competition

ASHP Clinical Skills Competition - Pharmacist's Care Plan

Problem Identification and Prioritization with Pharmacist's Care Plan

A. List all health care problems that need to be addressed in this patient using the table below.
B. Prioritize the problems by indicating the appropriate number in the "Priority" column below:
   1 = Most urgent problem (Note: There can only be one most urgent problem)
   2 = Other problems that must be addressed immediately or during this clinical encounter; **OR**
   3 = Problems that can be addressed later (e.g. a week or more later/at discharge or next follow up visit**)**

**Please note, there should be only a "1", " 2", or "3" listed in the priority column, and the number "1" should only be used once.*

Health Care Problem	Priority	Therapeutic Goals	Recommendations for Therapy	Monitoring Parameters and Endpoints

TEAM #_____

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ASHP Clinical Skills Competition - Pharmacist's Care Plan - 2018 Answer Key

Evaluated for competition

Problem Identification and Prioritization with Pharmacist's Care Plan

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   3 = Problems that can be addressed later (e.g. a week or more later)

**Please note, there should be only a "1", "2", or "3" listed in the priority column, and the number "1" should only be used once.*

Health Care Problem	Priority	Therapeutic Goals	Recommendations for Therapy	Monitoring Parameters and Endpoints
Moderate-Severe *Pneumocystis jiroveci* pneumonia (PJP)	1	• Treat acute PJP infection • Reduce the risk of morbidity and mortality from infection • Resolve symptoms of infection • Prevent future PJP infection	• Discontinue ceftriaxone and azithromycin • Classify PJP as moderate-severe (pO2 < 70 mmHg and alveolar-arterial O2 gradient ≥ 35 mmHg) to warrant initial treatment with IV therapy • Initiate first-line recommended therapy for moderate-severe PJP: Trimethoprim-sulfamethoxazole (TMP/SMX) IV 15-20 mg/kg/day divided in 3-4 doses every 6-8 hours (based on the trimethoprim component) 136 lbs/2.205 kg = 61.7 kg 15-20 mg/kg/day * 61.7 kg = 925 – 1236 mg/day Divided in 3 divided doses: 308 – 411 mg/dose every 8 hours OR in 4 divided doses: 231 mg – 308 mg/dose ever 6 hours (any dose in this range is acceptable) Transition to PO TMP/SMX when clinically stable (respiratory rate normal, afebrile x72 hours, dyspnea improves) Note that IV TMP/SMX stability is dependent on the concentration in the IV bag, and the diluent must be dextrose 5% in water. Thus, patients are at risk for administration of excess free water and hyponatremia especially with q6h dosing (bonus point) • Prompt initiation of corticosteroids (ideally within 72 hours of PJP diagnosis/therapy) Prednisone 40 mg PO BID x 5 days then Prednisone 40 mg PO daily x 5 days then Prednisone 20 mg PO daily x 11 days (IV methylprednisone would also be appropriate with the correct conversion factor: 4 mg	*Efficacy* • Resolution of infection (e.g. defervescence, resolution of dyspnea) *Safety* • Potential adverse effects: -Basic metabolic panel daily Hyperkalemia (monitor K+ especially while on lisinopril) Elevated serum creatinine (monitor creatinine) Hyponatremia (monitor sodium) -Complete blood count daily Bone marrow suppression less likely with shorter courses of therapy (monitor CBC with differential) -Rash and photosensitivity potential (monitor skin for any erythematous rashes) -S/Sx of hypersensitivity reactions -Development of hemolytic anemia (G6PD deficient, but rare with TMP/SMX) Development of nausea/vomiting/diarrhea, C. difficile risk (any antibiotics)

			methylprednisolone to 5 mg prednisone) Recommend to take prednisone with food and in the morning • Treatment duration: 21 days • Secondary prophylaxis: TMP/SMX 160-800 mg (double strength) tablets, 1 PO daily for prophylaxis until CD4 count is above 200 for > 3 months; prophylaxis should be reintroduced if the CD4 count falls approximately below 200 or CD4 percentages falls approximately below 14% -Less preferred (lower DHHS recommendation): 160-80 mg tablets three times weekly OR 80-400 mg (single strength) tablets daily -Dapsone should be avoided as a secondary prophylaxis option since the patient is G6PD deficient and at risk for hemolytic anemia -Atovaquone PO and inhaled pentamidine would also be options for prophylaxis but are not preferred over TMP/SMX (pentamidine also does not have activity against Toxoplasmosis) • No need for additional primary prophylaxis currently (TMP/SMX also has activity against *Toxoplasma gondii* and the patient has a positive IgG to *Toxoplasma gondii* so he has previously been exposed, which would warrant primary prophylaxis since his CD4 count is also < 100); this should be continued until the CD4 count is > 200 for 3 months (same prophylaxis duration as PJP) • Supplemental oxygen as needed to increase O2 saturation (normal > 95%) (bonus) ● Continue acetaminophen as needed for fever control	● Prednisone: elevated blood glucose, restlessness, CNS disturbances, elevated blood pressure, increased appetite ● Monitor for signs and symptoms consistent with immune reconstitution inflammatory syndrome (can occur in patients with PJP, but not as likely as with some other opportunistic infections)
HIV infection (newly diagnosed)	**2**	● Control HIV infection and achieve undetectable viral load within 2-8 weeks of starting therapy ● Boost the immune system and CD4 count to above	• Patient has a clinical presentation consistent with HIV infection (fever, lymphadenopathy, fatigue, night sweats, thrombocytopenia) • Laboratory tests: recommend baseline resistance testing • Bonus: recommend hepatitis C screening (Hep C antibody) • The patient needs to be started on antiretroviral therapy within 2 weeks of PJP diagnosis/treatment.	*Efficacy* • Recheck HIV viral load in 2-8 weeks to determine if antiretroviral therapy is effective; if detectable repeat every 4-8 weeks until <200 copies/mL then approximately every 3 months • Recheck CD4 count in 3-6

		500 ● Prevent HIV transmission and mitigate public health risk ● Maintain psychosocial balance with new diagnosis ● Prevent future opportunistic infections ● Engage in safe sex practices	First line options typically are comprised of two nucleoside reverse transcriptase inhibitors with an integrase inhibitor (less preferred are protease inhibitors) and include: **-bictegravir/emtricitabine/tenofovir alafenamide (single tablet regimen and once daily – easier for compliance, but the most recent combination tablet to be FDA-approved)** **-dolutegravir plus tenofovir alafenamide/tenofovir disoproxil fumarate with emtricitabine (two tablets and once daily regimen)** -raltegravir plus tenofovir alafenamide/tenofovir disoproxil fumarate with emtricitabine (two tablets and raltegravir is twice daily; less preferred regarding compliance and on twice daily calcium carbonate which may make spacing challenging -elvitegravir/cobicistat/emtricitabine/tenofovir disoproxil fumarate or tenofovir alafenamide (single tablet regimen, but requires boosting agent with cobicistat for drug interaction with fluticasone) <u>DO NOT recommend</u> doluteravir/abacavir/lamivudine since the patient is HLAB*5701 positive and would be at risk for a life-threatening hypersensitivity reaction Protease inhibitor-based regimens would be reasonable, but not the most preferred option in this case A single-tablet regimen or once daily regimen may be preferred since the patient is concerned about a complex regimen • Recommend social work and case manager involvement for new diagnosis • Encourage patient to become involved in support communities if interested • Provide counseling on newly diagnosed HIV with expectations, goals of care, and management/adherence to antiretroviral regimen • Establish care with an outpatient infectious diseases provider for follow-up • Counsel on HIV transmission through body fluids (blood, semen, vaginal fluids)	months • Bictegravir, raltegravir, dolutegravir, and elvitegravir-containing regimens may be appropriately spaced from certain divalent and trivalent cation containing antacid (magnesium, aluminum, and calcium) due to concern for chelation and decreased absorption of the integrase inhibitor (give integrase inhibitor at least 2 hours before antacid or 6 hours after) *Safety* • These antiretroviral regimens are well-tolerated for the most part; general side effects include nausea, headache, upset stomach, and insomnia • Dolutegravir: increase in serum creatinine by up to ~0.2 mg/dL; potential side effects of headache, insomnia, and other neuropsychiatric effects • No specific/notable adverse effects for raltegravir, bictegravir, or elvitegravir different from the general adverse effects noted above • Cobicistat: no antiretroviral activity, but a pharmacokinetic booster; increase in serum creatinine by ~0.2 mg/dL; strong CYP3A4 inhibitor (caution with potential drug interactions) • Tenofovir: SCr monitoring (tenofovir alafenamide associated with less long-term

			• Utilize condoms properly with every sexual encounter • Adhere to antiretroviral therapy to achieve an undetectable viral load to minimize transmission risk • Talk to partner regarding pre-exposure prophylaxis (PrEP) • Counsel on where to find additional resources and information regarding safe sexual practices from the Centers for Diseases Control and Prevention • Regularly monitor for signs and symptoms consistent with sexually transmitted infections; routine annual screening (syphilis, gonorrhea, chlamydia)	renal toxicity and bone mineral density loss than tenofovir disoproxil fumarate); rarer: Fanconi's syndrome and lactic acidosis
Oral Candidiasis (newly diagnosed)	**2**	● Resolve infection and white plaques within the oral cavity	● Oral candidiasis is a common co-infection with PJP ● Preferred therapy: systemic therapy is preferred over topical therapy for oral candidiasis in HIV patients Fluconazole 100 mg PO daily for 7-14 days (can be given with or without food) Alternative regimens (topical therapies): nystatin 500,000 units PO (swish and swallow/spit) four times daily or clotrimazole troches 10 mg PO (dissolve) five times daily (also potential for adherence issues) • No indication for secondary prophylaxis	*Efficacy* • Resolution of white, painless plaques in oropharyngeal cavity *Safety* • Fluconazole: monitor liver function tests, can cause rash, QTc interval is not considered prolonged; potential drug interaction with cobicistat/elvitegravir if this regimen is selected
Hypertension (controlled)	**3**	● Target blood pressure of < 130/80 mmHg (based on 2017 American College of Cardiology guidelines)	● Blood pressure is currently at goal ● Recommend continuing lisinopril ● Encourage lifestyle modifications (e.g. DASH diet and increased exercise, as tolerated)	*Efficacy* ● Blood pressure at goal range of < 130/80 mmHg ● Monitor while inpatient and follow up outpatient with primary care provider *Safety* ● Prevent hypotension: maintain blood pressure > 90/60 mmHg ● Lisinopril: hyperkalemia and serum creatinine (monitor K+ and SCr/BUN especially while on TMP/SMX), dry cough
GERD (controlled)	**3**	● Control and minimize reflux symptoms	● Counsel on minimizing consumption of foods that trigger symptoms including spicy or hot foods ● Elevate the head of bed using blocks or wedge at bedtime	*Efficacy* ● Reflux symptoms especially at night and if consuming spicy/hot foods

			• Avoid eating 2-3 hours before bedtime • Appropriately space calcium carbonate and integrase inhibitor due to chelation and reduced absorption of integrase inhibitor (see HIV monitoring section for details)	*Safety* • Generally well-tolerated (belching, gas, constipation)
Allergic rhinitis	**3**	• Control and minimize seasonal allergies	• Attempt to minimize exposure to specific allergic triggers if applicable • Fluticasone is appropriate to continue depending on the antiretroviral regimen selected • Fluticasone should NOT be used in combination with strong CYP3A4 inhibitors (i.e. cobicistat if this regimen was selected) due to increased systemic steroid concentrations and systemic effects; beclomethasone nasal spray minimizes this risk • Counsel on appropriate intranasal administration	*Efficacy* • Control seasonal allergy symptoms *Safety* • Intranasal fluticasone: rhinorrhea, headache (minimal systemic absorption)
Immunizations	**3**	• Prevent potential disease burden and optimize public health through immunizations specific to patients with HIV	• Administer appropriate immunizations to the patient either prior to discharge or at follow-up visit • Recommend annual inactivated influenza vaccine • Recommend 1 dose of PCV13 followed by 1 dose of PPSV23 at least 8 weeks after PCV13, and a second dose of PPSV23 at least 5 years after the first dose of PPSV23 (based on HIV diagnosis) • Recommend 2 doses of MenACYW at least 8 weeks apart and revaccinate with 1 dose of MenACYW every 5 years (based on HIV diagnosis) • Recommend Td booster (has already received Tdap before) and then every 10 years • Does not require hepatitis B or hepatitis A vaccines since hepatitis surface antibody is reactive and hepatitis A IgG is reactive • Live, attenuated vaccines should not be administered to HIV patients with CD4 counts <200	*Efficacy* • Prevention of vaccine-preventable infectious diseases *Safety* • Injection site reactions (local) – redness, swelling, itching, pain • Low grade fever and general malaise to be expected for a few days • Observe patient for at least 15 minutes after being vaccinated • Monitor for signs of anaphylaxis (throat swelling, difficulty breathing)