

2008
ASHP National Clinical Skills Competition
CASE

2008 ASHP Clinical Skills Competition

NATIONAL COMPETITION CASE

Directions to 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, Drug Therapy Assessment Worksheet [DTAW], and Pharmacist's Care Plan).

IMPORTANT NOTE: Only the Pharmacist's Care Plan will be used for evaluation purposes. The Drug Therapy Assessment Worksheet is simply a tool to assist you in the decision-making process.

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

Demographic and Administrative Information				
Name: Rogers, Buckley		Patient ID: 110606		
Address: 12 45 th Street		Room & Bed: Neurology ICU Room 221		
Ocean City, NJ		Physician: Rose		
Date of Birth: 4-5-1938		Pharmacy: CVS #34234524		
Height: 71"	Weight: 110 kg	Race: Caucasian		
Gender: Male		Religion: None specified		
History of Present Illness		Vitals & Other Tests		
<p>BR presented to the ED 7days ago with mental status changes after a fall. EEG showed that he had a grand mal seizure. He was emergently intubated for airway protection and placed on a ventilator. A chest X-ray was performed to confirm endotracheal tube placement and did not have signs of pneumonia. He was transferred to the Neurology ICU and diagnosed with a subarachnoid hemorrhage (SAH).</p> <p>Yesterday (hospital day #6) BR's nurse noted that he had thick, copious secretions. Today (hospital day #7) BR spiked a fever to 102.3° F and has new leukocytosis. A chest X-ray reveals an infiltrate in the left lower lobe, and the team diagnoses him with pneumonia. His blood pressure drops precipitously and does not respond to fluid resuscitation with 4L of normal saline and he was started on norepinephrine at 4 mcg/min.</p>		<p>BP 84/44 Pulse 120 Temp Tmax 102.3 Tcurrent 101.1 Resp 24 (on ventilator)</p> <p>ABG: pH 7.35 PaCO₂ 30 PaO₂ 65 HCO₃ 26</p>		
Past Medical History		Chemistry and CBC		
		HD#1	HD #6	
		HD#7		
<p>CAD s/p MI 2004 Hypertension Hyperlipidemia Chronic Renal Insufficiency DVT 2 months ago Depression</p>		<p>Na 140 K 3.9 Cl 100 CO₂ 21 BUN 27 SCr 1.5 Glucose 168</p> <p>WBC 7.8 Hgb 11.4 HCT 34.2 Plts 286</p> <p>Calcium 9.2</p> <p>Lactate 6.8 AST 34 ALT 37 Total bili 1.0 Direct bili 0.6 INR 5.2</p>	<p>Na 140 K 4.2 Cl 100 CO₂ 24 BUN 42 SCr 2.3 Glucose 172</p> <p>WBC 14.5 Hgb 11.5 HCT 33.4 Plts 186</p> <p>Albumin 2.8</p> <p>AST 34 ALT 37</p>	<p>Na 140 K 4.2 Cl 100 CO₂ 24 BUN 45 SCr 2.6 Glucose 194</p> <p>WBC 18.9 Hgb 10.9 HCT 32.1 Plts 168</p> <p>Lactate 7.2 AST 54 ALT 41 Total bili 1.1 Direct bili 0.6 INR 1.2</p>
Family History				
Unknown				

**ASHP CLINICAL SKILLS COMPETITION
PHARMACIST'S PATIENT DATA BASE FORM (Cont.)**

Social History (from outpatient chart)	Cultures
Tobacco: Denies ETOH: Occasional Illicit Drugs: Past history of occasional marijuana, last used >20 years ago	HD #1 Blood culture 2/2 no growth Urine culture - <10,000 GNRs
Caffeine: Occasional <u>Occupation</u> : Retired Astronaut <u>Status</u> : Widowed <u>Children</u> : None <u>Physical Activity</u> : Moderate <u>Diet</u> : Nothing notable	Urinalysis (from HD #1) Appearance – Clear, yellow Specific gravity – 1.017 Blood – Trace Ketones – Trace Leukocyte esterase – Trace Nitrites – Negative Protein 4+ Glucose – Trace Yeast 2+ WBCs – 0-4 per high powered field RBCs – 4-10 per high powered field
Procedures	X-ray
Intubated and placed on ventilator upon admission Externalized ventricular drain (ventriculostomy) placed on hospital day #1 EEG on day 1 showed seizure activity that has resolved Nasogastric tube placed for tube feeds and medications An IVC filter was placed on day #5. Lower extremity Doppler – negative for DVT in both LEs	Chest (Day #7) – Left lower lobe consolidation Radiologist interpretation: probable pneumonia
Physical Exam	
General – Elderly, obese man who is sedated on a ventilator	
Skin – Cool extremities with 2+ edema in lower extremities	
HEENT – PERRLA; pink conjunctiva	
Chest – decreased breath sounds and crackles on left side	
CV – tachycardic, +S1S2, no bruits	
Abd – Soft, non-distended; no masses or obvious tenderness	
Neuro – Limited by sedation; deep tendon reflexes normal; tested cranial nerves normal	

**ASHP CLINICAL SKILLS COMPETITION
PHARMACIST'S PATIENT DATA BASE FORM (Cont.)**

Allergies/Intolerance's		Prescription Coverage	
Penicillin - Rash		Insurance: Medicare	
		Copay:	
		Cost per month:	
		Annual Income:	
Current Drug Therapy			
Drug Name/Dose/Strength/Route	Prescribed Schedule	Duration Start–Stop Dates	Indication
1. Propofol infusion at 20 mcg/kg/min	Continuous infusion	HD #1 – present	Sedation
2. Sliding scale insulin	PRN after glucose checks	HD #1 – present	Hyperglycemia
3. Simvastatin 20 mg via tube	Daily	HD #1 – present	Hyperlipidemia
4. Lansoprazole Solutab 30mg	Daily	HD #2 – present	Stress ulcer prophylaxis
5. Phenytoin 100 mg via tube	Q8H	HD #2 - present	Seizure
6. Fluoxetine 20 mg via tube	Daily	HD #1 – present	Depression
7. NSS infusion	100 mL/hour	HD#7 - present	Hypotension
8. Norepinephrine infusion	4 mcg/min	HD#7 – present	Hypotension
9. Promote® with fiber via tube	80 ml/hour continuously	HD#3 – present	Nutrition
10. Phytonadione 10mg IV	Daily	HD#1 – HD #2	Reversal of anticoagulant state
11. Phenytoin 1000mg IV	Once	HD#1	Seizure
Medication History			
Home medications include: Amlodipine 5mg PO daily, Lisinopril 5mg PO daily, Warfarin 2.5 mg daily, and simvastatin as above. Compliance is unknown.			

Drug Therapy Assessment Worksheet (DTAW)

The Drug Therapy Assessment Worksheet (DTAW) will serve as a guide to identify any drug-related problems that your patient may have. You may make notes on the DTAW. **However, the Drug Therapy Assessment Worksheet will not be scored.** As you proceed through all the questions on the DTAW, you will accumulate a list of drug therapy problems. All of these problems should be assessed on your Pharmacist's Care Plan. Drug-related problems may be listed as separate items on your Pharmacist's Care Plan or addressed in your recommendations for therapy of the acute or chronic disease states that the medicines are being used to treat. Teams will be evaluated on identifying and making appropriate recommendations for drug-related problems in the following areas below:

1. Correlation between drug therapy and medical problems
2. Appropriate drug selection
3. Drug regimen
4. Therapeutic duplication
5. Drug allergy or intolerance
6. Adverse drug events
7. Interactions: drug–drug, drug–disease, drug–nutrient, and drug–laboratory test
8. Social or recreational drug use
9. Failure to receive therapy
10. Financial impact
11. Patient knowledge of drug therapy

ASHP CLINICAL SKILLS COMPETITION DRUG THERAPY ASSESSMENT WORKSHEET (DTAW)

Type of Problem	Assessment	Presence of Drug-Related Problem	Comments/Notes
Correlation between Drug Therapy and Medical Problems	<p>Are there drugs without a medical indication?</p> <p>Are any medications unidentified (are any unlabeled or are any—prior to admission/clinic visit—unknown)?</p> <p>Are there untreated medical conditions? Do they require drug therapy?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	
Appropriate Drug Selection	<p>What is the comparative efficacy of the chosen medication(s)?</p> <p>What is the relative safety of the chosen medication(s)?</p> <p>Has the therapy been tailored to this individual patient?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	
Drug Regimen	<p>Are the prescribed dose and dosing frequency appropriate—within the usual therapeutic range and/or modified for patient factors?</p> <p>Is pm use appropriate for those medications either prescribed or taken that way?</p> <p>Is the route/dosage form/mode of administration appropriate, considering efficacy, safety, convenience, patient limitations, and cost?</p> <p>Are doses scheduled to maximize therapeutic effect and compliance and to minimize adverse effects, drug interactions, and regimen complexity?</p> <p>Is the length or course of therapy appropriate?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	
Therapeutic Duplication	<p>Are there any therapeutic duplications?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	
Drug Allergy or Intolerance	<p>Is the patient allergic to or intolerant of any medicines (or chemically related medications) currently being taken?</p> <p>Is the patient using any method to alert health care providers of the allergy/intolerance (or serious medical problem)?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	

ASHP CLINICAL SKILLS COMPETITION DRUG THERAPY ASSESSMENT WORKSHEET (DTAW)

Type of Problem	Assessment	Presence of Drug-Related Problem	Comments/Notes
Adverse Drug Events	Are there symptoms or medical problems that may be drug induced? What is the likelihood that the problem is drug related?	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	
Interactions: Drug-Drug, Drug-Disease, Drug-Nutrient, and Drug-Laboratory Test	<p>Are there drug-drug interactions? Are they clinically significant?</p> <p>Are any medications contraindicated (relatively or absolutely) given patient characteristics and current/past disease states?</p> <p>Are there drug-nutrient interactions? Are they clinically significant?</p> <p>Are there drug-laboratory test interactions? Are they clinically significant?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	
Social or Recreational Drug Use	<p>Is the patient's current use of social drugs problematic?</p> <p>Could the sudden decrease or discontinuation of social drugs be related to patient symptoms (e.g., withdrawal)?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	
Failure to Receive Therapy	<p>Has the patient failed to receive a medication due to system error or noncompliance:</p> <p>Are there factors hindering the achievement of therapeutic efficacy?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	
Financial Impact	<p>Is the chosen medication(s) cost effective?</p> <p>Does the cost of drug therapy represent a financial hardship for the patient?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	
Patient Knowledge of Drug Therapy	<p>Does the patient understand the purpose of his or her medication(s), how to take it, and the potential side effects of therapy?</p> <p>Would the patient benefit from education tools (e.g., written patient education sheets, wallet cards, and reminder packaging)?</p>	<ol style="list-style-type: none"> 1. A problem exists. 2. More information is needed for a determination. 3. No problem exists or an intervention is not needed. 	

Evaluated for
competition

ASHP Clinical Skills Competition - Pharmacist's Care Plan

Problem Identification and Prioritization with Pharmacist's Care Plan

Team # _____

- 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)
**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

ASHP Clinical Skills Competition - Pharmacist's Care Plan

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ANSWER KEY

ASHP Clinical Skills Competition - Pharmacist's Care Plan

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Health Care Problem	Priority	Therapeutic Goals	Recommendations for Therapy	Monitoring Parameters and Endpoints
Hospital-Acquired Pneumonia /Severe Sepsis Note: students may list sepsis and HAP together or separately; if they list separately, the order does not matter – either can be the #1 problem	1	Resolution of infection Prevention of mortality	Recommend collecting sputum and blood cultures Cefepime OR ceftazidime OR meropenem OR aztreonam PLUS Levofloxacin OR ciprofloxacin PLUS Vancomycin to a targeted trough of 15-20 mcg/mL Treat for 7-8 days unless <i>Pseudomonas</i> is cultured (14-15 days for <i>Pseudomonas</i>). Though not specifically in the guidelines, <i>Acinetobacter</i> and MRSA can also justify the 14-15 day course of therapy. Doses: Cefepime 2gm IV q24h or 1gm IV	Monitor for improvement in oxygenation (PaO2 >75) Follow daily WBC/differential – should trend downward Temperature (<100.4F) BP (>90 SBP) Cultures – monitor to change to definitive therapy as results return. No need to perform follow-up respiratory cultures, follow-up blood cultures should be performed if the initial sets are positive May repeat CXR after several days of therapy, but not a required monitoring parameter (patient improvement is enough)

Health Care Problem	Priority	Therapeutic Goals	Recommendations for Therapy	Monitoring Parameters and Endpoints
			<p>q12h Ceftriaxime 1gm IV q12h Meropenem 1gm IV q12h Aztreonam 1-2gm IV q6-8h Levofloxacin 750mg IV q48h Ciprofloxacin 400mg IV q12h Vancomycin dosing is flexible, as long as the target trough of 15-20 mcg/mL is stated AND 1gm q12h is NOT stated.</p> <p>Incorrect answers: Aminoglycoside (renal toxicity), piperacillin (allergy), imipenem (seizure potential); linezolid (drug interaction)</p> <p>Note: discontinuing fluoxetine and starting linezolid will not avoid the interaction due to fluoxetine's prolonged half life.</p>	<p>Monitor beta-lactams for hypersensitivity (looking for signs of rash/hives, eosinophils on differential)</p> <p>FQs: monitor for change in seizure activity</p> <p>Vancomycin: follow trough concentrations. The frequency of monitoring is variable since the patient is in acute renal failure</p>
Severe Sepsis		<p>Maintain SBP >90 mm Hg MAP > 65 Prevention of mortality/organ damage</p>	<p>Titrate norepinephrine to response Continue NSS infusion</p> <p>Incorrect answer: start activated protein C (contraindication – SAH)</p>	<p>BP Prevention of further organ damage – monitor SCr, LFTs, lactate, urine output</p>
Hyperglycemia (can be combined with sepsis)	2	<p>Blood glucose 80-150 mg/dL Prevention of complications of hyperglycemia (e.g. further infection) Decrease length of stay, ventilator time</p>	<p>Initiate continuous infusion insulin and titrate to response Typical dose: 1.5-2 units/hour</p>	<p>Blood glucose every 1-2 hours Electrolytes daily</p>
Renal failure	2	<p>Avoidance of drugs contraindicated in this disease state</p>	<p>Avoid aminoglycoside use Maintain/increase BP to SBP>90 – give NSS and vasopressor as in sepsis</p>	<p>Follow urine output and serum creatinine, electrolytes</p>

Health Care Problem	Priority	Therapeutic Goals	Recommendations for Therapy	Monitoring Parameters and Endpoints
Seizures	2	Prevention of seizures	<p>A drug-diet interaction exists between phenytoin and tube feedings</p> <p>1) Either of the below are sufficient:</p> <ul style="list-style-type: none"> • Hold tube feeds for 2 hours before and after phenytoin administration • Change phenytoin to IV (either same dose or 80% of current dose) <p>2) Students must check a phenytoin concentration. Albumin is 2.8, so either the phenytoin concentration must be adjusted for this by calculation, or a free phenytoin concentration should be checked</p> <p>Equation for adjusted PHT: $C_{adj} = C_{reported} / (0.2 \times \text{serum albumin}) + 0.1.$ </p> <p>Students do not have the information to calculate this due to the lack of a PHT concentration, but they should consider the role of albumin in the concentration they order (unless it is a free concentration)</p>	<p>Free phenytoin concentration 1-2 mcg/mL (or adjusted phenytoin concentration of 10-20 mcg/mL)</p> <p>Seizure activity</p> <p>Monitor for nystagnus, other adverse effects of phenytoin as outpatient</p>
Suboptimal nutrition	2	Improved nutrition; avoidance of further kidney damage, volume overload, and hyperkalemia	<p>Discontinue Promote® with fiber (high volume load)</p> <p>Begin Nepro® (or TwoCal NH®) at 40 ml/hour continuously (needs to be interrupted for phenytoin if that is still given orally). Rationale: these are calorie-rich products with decreased protein. Students can say “change to</p>	<p>Nutritional status (pre-albumin >15), electrolytes, urine output, glucose</p>

Health Care Problem	Priority	Therapeutic Goals	Recommendations for Therapy	Monitoring Parameters and Endpoints
Sedation	2	Prevent agitation while on ventilator Sedation score, e.g. Ramsey score = 3 (calm but alert)	calorie-dense tube feeds” instead of brand names. Ok to continue propofol or change to intermittent benzodiazepine (i.e. lorazepam 2mg q6h)	Ramsey or other sedation scale Propofol – must check triglycerides q48-72h, should follow BP (SBP>90)
DVT	2	Prevent DVT reformation, PE development	Begin sequential compression devices	DVT: LE swelling, redness, pain PE: pulmonary status, HR
CAD s/p MI	3	Prevention of further CV disease/acute CV event BP <130/80	Begin aspirin 81-162 mg PO q24h when stable (SAH resolved) Restart lisinopril when BP stable Consider initiation of beta-blocker therapy instead of amlodipine when BP stable Continue simvastatin	Bleeding (easy bruising, dark stool, etc) Potassium, renal function, BP HR LDL <100 (optional <70) TG <150 HDL >40
Depression	3	Prevention or successful treatment of depression; prevention of suicidal ideation	Continue fluoxetine	Mental health after acute events resolve