Team #_____

2023
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.

Pharmacist's Care Plan

Using the patient's data, you will be able to develop an effective care plan for your patient. Clearly define the healthcare problems. Healthcare 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 healthcare 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).

Remember:

- There should be only a "1", "2", or "3" listed in the priority column, and the number "1" should only be used once.
- When identifying individual problems for the case, use more specific terms when possible vs. general disease conditions. Also, use actual rather than weight-based doses when providing recommendations for therapy.

Team #_____

NATIONAL CASE
2023 ASHP CLINICAL SKILLS COMPETITION

Demographic and Administrative Information

Name: Albert King	**Patient ID:**
Sex: Male	**Room & Bed:** ED bed 8
Date of Birth: 6/27/51	**Admitting Physician:** Dr. Gary Clark
Height: 6'2"/ **Weight:** 208 lbs / **Ethnicity:** African American	**Religion:** Baptist
Prescription Coverage Insurance: Medicare	**Pharmacy:** Walgreens
Copay: $10	**Annual Income:** $65,000

Chief Complaint

"My dad has not been himself since earlier today."

History of Present Illness

Mr. King is a 72 y/o male brought in by his daughter due to altered mental status for the past several hours. Daughter states that the patient was able to perform his normal daily activities until this morning. Patient had a stroke several years ago and this episode reminds her of how he appeared then. She reports that patient is on a blood thinner for atrial fibrillation. Additionally, patient recently saw a gastroenterologist and was started on three new medications that he was supposed to take for a couple weeks for a stomach ulcer.

Past Medical History

Hypertension - diagnosed in 2003
Diabetes mellitus (Type II) - diagnosed in 2008
Atrial fibrillation- diagnosed in 2015
Cardioembolic cerebral vascular accident - diagnosed in 2015
Heart failure with reduced ejection fraction - diagnosed in 2018
Osteoarthritis - diagnosed in 2019
Chronic kidney disease – diagnosed in 2021
Peptic ulcer disease - diagnosed 11/27/23; esophagogastroduodenoscopy identified non-bleeding gastric ulcer, *H. pylori* confirmed via gastric biopsy

Outpatient Drug Therapy

Prescription Medication & Schedule	Duration Start–Stop Dates	Prescriber	Pharmacy
Clarithromycin 500 mg PO BID x 14 days	Started 11/29/23	Dr. Kenneth Shepherd	Walgreens
Metronidazole 500 mg PO TID x 14 days	Started 11/29/23	Dr. Kenneth Shepherd	Walgreens
Pantoprazole 40 mg PO BID x 14 days	Started 11/29/23	Dr. Kenneth Shepherd	Walgreens
Warfarin 5 mg PO daily	2015 to present	Dr. Steve Vaughn	Walgreens
Carvedilol 25 mg PO BID	2019 to present	Dr. Steve Vaughn	Walgreens
Metformin 1000 mg PO BID	2008 to present	Dr. Steve Vaughn	Walgreens
Lisinopril 20 mg PO daily	2012 to present	Dr. Steve Vaughn	Walgreens
Furosemide 20 mg PO daily	2018 to present	Dr. Steve Vaughn	Walgreens

Non-Prescription Medication/Herbal Supplements/Vitamins	Duration Start–Stop Dates	Prescriber	Pharmacy
Aspirin 81 mg PO daily	2015 to present		
Ibuprofen 400 mg PO Q6h PRN	2021 to present		

Medication History

Daughter brought all of patient's medications with him to the ED. Reports patient is adherent to his medications and takes them every day. She states that he has been on the same dose of warfarin for years. His daughter mentioned that

the patient was told to hold his warfarin for several days prior to his endoscopy; he restarted it in the evening the day that he had his procedure.. Additionally, she states that he usually takes ibuprofen a couple times per day for arthritis pain in his knee.

Allergies/Intolerances
NKDA

Surgical History
Esophagogastroduodenoscopy- 11/27/23
Patent foramen ovale closure- 2015

Family History
Father- Diabetes mellitus (Type II), hypertension
Mother- Hypertension, end-stage kidney disease

Social History
Tobacco- never smoker
Alcohol- drinks 1 to 2 drinks occasionally
Illicit drug use- never
Occupation: Mechanic (retired)

Immunization History
Tdap booster: 6/2017
COVID-19: Doses up to date per recent guidelines
Influenza: 10/2022

Review of Systems
Unable to be obtained as patient is not alert to person, place, or time

Physical Exam
General: no acute distress
Head: normocephalic, without obvious abnormality, atraumatic
Eyes: pupils equal, round, and reactive to light, diplopia, conjunctiva clear
Neck: supple, symmetrical
Neuro: withdraws to pain, slurred speech, left-sided facial droop, ataxia oriented only to self, NIH Stroke Scale score of 15
Lungs: clear to auscultation bilaterally, symmetric excursion
CV: irregularly irregular rhythm, rate 150s
Abdomen: soft, non-tender non-distended; positive bowel sounds
Skin: skin color, texture, turgor normal
Extremities: left-sided weakness warm and well-perfused, no cyanosis, clubbing, or edema

Vital signs
HR: 153 bpm
RR: 22 bpm
O_2 Saturation: 96% on room air
BP: 195/108 mmHg
Temp: 37.2°C

Labs and Microbiology

	12/2/2023	**2/4/23**	
Metabolic Panel			
Na (mmol/L)	142	140	
K (mmol/L)	4.7	3.8	
Cl (mmol/L)	102	98	
CO_2 (mmol/L)	22	23	
BUN (mg/dL)	24	20	
SCr (mg/dL)	2	1.8	
Glucose (mg/dL)	338	98	
Calcium (mg/dL)	8.2	8.5	
Phosphorus (mg/dL)	4.5		
Magnesium (mg/dL)	2.0		
Albumin (g/dL)	3.2		
AST (international units/L)	36		
ALT (international units/L)	48		
Total bili (mg/dL)	0.4		
CBC			
WBC (K/mm^3)	8.2	9.1	
Hgb (g/dL)	11.3	11.8	
Hct (%)	42	44	
Plt (K/mm^3)	212	220	
Fasting Lipid Panel			
Total cholesterol (mg/dL)	192		
LDL (mg/dL)	114		
HDL (mg/dL)	40		
Triglycerides (mg/dL)	107		
Other			
INR	8.7	2.6	
Troponin HS (pg/mL)	18.9		
BNP (pg/mL)	79		
Hemoglobin A1c (%)	7.8	6.6	
Urine albumin-to-creatinine ratio (mg/g)	52		

Recent Warfarin Dosing and INR

Date	**Warfarin dose**	**INR**
11/27/23	Held	1.2
11/22/23	Warfarin placed on hold for procedure	-
10/12/23	5 mg daily	2.9
8/17/23	5 mg daily	2.8
6/22/23	5 mg daily	2.6
4/27/23	5 mg daily	2.8
3/2/23	5 mg daily	2.7

Other Diagnostic Tests
12/2/2023 CT head without contrast: intracerebral hemorrhage of the right hemisphere
12/2/2023 ECG: irregularly irregular rhythm, absent P waves, rapid ventricular rate
2/4/23 transthoracic echocardiogram: left ventricular ejection fraction = 30-35%

Emergency Department Notes:

Assessment:
CT head suggests ICH in the setting of supratherapeutic INR and hypertension. Also noted to be in A-fib with rapid ventricular rate

Plan:
Code Stroke team initiated with pharmacy to address anticoagulation reversal, blood pressure control, initiation of amiodarone, when to resume anticoagulation, and any other pharmacotherapy related problems. Begin insulin infusion per protocol (see protocol below). Place patient NPO including medications for now due to altered mental status. Transfer to neuro ICU.

As the critical care pharmacist, please address pharmacotherapy recommendations, including all home medications, you may have to optimize this patient's care in the hospital and at discharge.

Hospital regular human insulin infusion initiation protocol	
Blood glucose (mg/dL)	**Initial insulin infusion rate (units/hour)**
<150	0.5
150-179	1
180-240	2
241-300	3
301-360	4
>360	5
*Titrate per nursing protocol	

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)

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. When identifying individual problems for the case use more specific terms when possible vs general disease conditions. Also, use actual rather than weight-based doses when providing recommendations for therapy.

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters

TEAM #____

ASHP Clinical Skills Competition - Pharmacist's Care Plan

Evaluated for competition

Problem Identification and Prioritization with Pharmacist's Care Plan

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters

TEAM #____

2023

ASHP Clinical Skills Competition℠

NATIONAL CASE ANSWER KEY

ASHP Clinical Skills Competition - Pharmacist's Care Plan – 2023 Answer Key

Evaluated for competition

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.
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   1 = Most urgent problem (Note: There can only be one most urgent problem)
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**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	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters

Intracerebral hemorrhage with supra therapeutic INR	**1**	Vitamin K 10 mg IV
		• 10 mg IV x 1 dose
		• Given over 10-30 minutes; not to exceed 1 mg/minute
		
		4-factor prothrombin complex concentrate
		• Fixed dose: 1500 units IV x1 dose
		  ○ Reference: Administer at a rate of 0.12 mL/kg/min (~3 units/kg/minute), max rate of 8.4 mL/minute (~210 units/minute)
		OR
		• Weight-based: 50 units/kg (4,500 to 5,000 units) IV x 1 dose
		  ○ Reference: Administer at a rate of 0.12 mL/kg/min (~3 units/kg/minute), max rate of 8.4 mL/minute (~210 units/minute)
			Therapeutic Goals:
			• Rapid reversal of anticoagulation
			• Prevent worsening hemorrhage
			
			Monitoring Parameters:
			• INR
			• CBC
			• CT scan
			• Signs or symptoms of thromboembolism
			• Signs or symptoms of worsening bleeding

Hypertensive emergency	**2**	Parenteral antihypertensive agent initiated within 2 hours of presentation • Nicardipine: Initiate at 5 mg/hour; titrate by 2.5 mg/hour every 5 to 15 minutes to maintain BP goal. Maximum dose of 15 mg/hour. OR • Clevidipine: Initiate at 1 to 2 mg/hour; titrate by doubling the dose every 90 seconds. As BP approaches goal, titrate by smaller increments to achieve BP goal. Maximum dose of 21 mg/hour. Note: venous vasodilators would not be a suitable option. Cardiology wants to pursue rhythm control so a continuous beta-blocker could precipitate bradycardia.	Therapeutic Goals: • SBP 130 to 150 mm Hg within 1 hour of initiation of treatment Monitoring Parameters: • BP • HR

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters

Atrial fibrillation	**2**	Rate/rhythm control
		• Amiodarone 150 mg IV bolus given over 10 to 30 minutes, followed by 1 mg/min infusion x6 hours, followed 0.5 mg/min infusion OR
		• Amiodarone 300 mg IV bolus over 1 hour, followed by 10 to 50 mg/hour.
		• Switch to oral amiodarone when able to take enteral medications
		• Provide a total loading dose of 6-10 g (total IV and PO doses)
		  ○ Once switched to PO, finish remainder of loading dose with a higher dosing regimen (400 to 1200 mg/day in divided doses)
		• Maintenance dose of amiodarone 100 to 200 mg PO daily
		
		Beta Blocker
		• Unable to take home dose of carvedilol 25 mg BID while NPO. Resume when able to take enteral medications.
		
		Anticoagulation
		• Hold therapeutic anticoagulation for 7 to 8 weeks after bleed
		• Afterwards, resume anticoagulation with a DOAC (CHA2DS2-VASc score of 6) (pick 1)
		  ○ Apixaban 5 mg PO BID
		  ○ Rivaroxaban 20 mg PO daily
		  ○ Edoxaban 60 mg PO daily
		  ○ Dabigatran 150 mg PO BID
			Therapeutic Goals:
			• Maintain resting HR <110 BPM; however, if patient develops deterioration of left ventricular function, a stricter goal of <80 BPM would be appropriate
			• Maintain normal sinus rhythm with amiodarone
			• Prevention of stroke
			
			Monitoring Parameters (amiodarone):
			• Liver function tests
			• Pulmonary toxicity
			• Regular ophthalmic exams
			• Telemetry (arrhythmias, QTc)
			• Electrolytes
			• HR and BP
			• Thyroid function
			Monitoring parameters (carvedilol)
			• HR and BP
			Monitoring parameters (DOAC)
			• Signs or symptoms of bleeding
			• SCr

Diabetes mellitus	**2**	• Initiate titratable insulin infusion (preferred therapy in the setting of critical illness and uncontrolled hyperglycemia):
		  ○ Regular insulin IV. Per hospital protocol, start infusion at 4 units/hour.
		  ○ Maintain goal BG of 140-180 mg/dL
		• Transition to subcutaneous basal or basal + bolus insulin regimen once on a stable insulin infusion rate and within goal for at least 6 hours
		  ○ Calculate 24 hour insulin requirement from insulin infusion
			Therapeutic Goals:
			• BG of 140-180 mg/dL while in hospital
			• HbA1c goal of <7% as an outpatient
			
			Monitoring Parameters:
			• BG
			• SCr
			• Signs or symptoms of ketoacidosis (SGLT-2 inhibitor)

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters
		▪ May extrapolate 24 hour requirements from the last 6 hours ▪ Take 60-80% of 24 hour insulin infusion to calculate subcutaneous insulin dose o If still NPO: Give all as long-acting insulin (glargine, detemir, or degludec). Administer dose at least 2 hours prior to stopping infusion. Administer dose subcutaneously once daily (BID reasonable for detemir). o If patient is eating: Give half of calculated dose as long-acting (see above). Administer long-acting as above prior to stopping infusion. Divide the remainder of the total daily dose by three and administer as rapid-acting (lispro, aspart, glusiline) with meals. Administer rapid-acting subcutaneouslyright before meals or immediately following meals if patient has unreliable oral intake. • Resume home dose of metformin (1000 mg PO BID) once able to take enteral medications • Add SGLT-2 inhibitor once able to take enteral medications o Dapagliflozin 10 mg PO daily OR o Empagliflozin 10 mg PO daily	
Peptic ulcer disease	**2**	*H. pylori* treatment • Patient is NPO and cannot receive current *H. pylori* regimen without enteral access • Without enteral access, an IV regimen should be given which could include: o PPI BID ▪ Esomeprazole 20 mg IV BID OR ▪ Pantoprazole 40 mg to 80 mg IV BID o Levofloxacin 500 mg IV initial dose, then 250 mg every 24 hours (renally dose adjusted for 500 mg daily). Administer dose over 60 minutes o Ampicillin 2 g IV Q8 hours (renally dose adjusted for 2 g Q6 hours)	Therapeutic Goals: • Eradication of *H. pylori* • Prevent gastric cancer • Symptom relief Monitoring Parameters: • Test to prove eradication of *H. pylori* at least 4 weeks after completing antibiotics and at least 1 to 2 weeks after PPI has been withheld • Symptoms of PUD such as abdominal pain

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters
		○ Total duration of *H. pylori* regimen is 14 days ○ If able to take enteral medications prior to completion of H. pylori therapy regimen, may complete remaining duration with enteral medications: ▪ Levofloxacin 250 mg PO daily (1:1 IV:PO dose conversion) ▪ Amoxicillin 1000 mg PO BID ▪ PPI (any of the enteral options listed below) OR ○ Esomeprazole 40 mg IV Q8H ○ Levofloxacin 500 mg IV initial dose, then 250 mg every 24 hours (renally dose adjusted for 500 mg daily). Administer dose over 60 minutes ○ Metronidazole 200 mg to 500 mg IV Q8 to Q12H ○ Total duration of regimen is 7 to 14 days ○ If able to take enteral medications prior to prior to completion of *H. pylori* therapy regimen, may complete remaining duration with enteral medications: ▪ Levofloxacin 250 mg PO daily (1:1 IV:PO dose conversion) ▪ Metronidazole 250 mg to 500 mg PO Q8 to Q12H ▪ PPI (any of the enteral options listed below • Continue PPI for duration of therapy for *H. pylori* treatment and could extend treatment 4 to 8 weeks if needed based on clinical response ○ Appropriate doses include: ▪ omeprazole 40 mg PO BID ▪ lansoprazole 30 mg to 60 mg PO BID ▪ rabeprazole 20 mg PO BID ▪ esomeprazole 20 mg PO BID ▪ pantoprazole 40 to 80 mg PO BID NSAIDs • Discontinue aspirin- patient does not have an indication • Recommend discontinuation of ibuprofen	• QTc via ECG with concomitant levofloxacin and amiodarone

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters

VTE prophylaxis	**2**	• Initiate mechanical VTE prophylaxis with intermittent pneumatic compression device at the time of hospitalization
		• Initiate pharmacologic VTE prophylaxis 48-96 hours after symptom onset if bleed has stabilized
		  ○ Heparin 5000 units subcutaneously BID or TID
		  ○ Enoxaparin 40 mg subcutaneously daily).
			Therapeutic Goals:
			• Prevention of VTE
			
			Monitoring Parameters:
			• Signs or symptoms of bleeding
			• CBC
			• SCr (if enoxaparin is chosen)

Heart failure with reduced ejection fraction	**3**	Optimization of GDMT once able to take enteral medications • Add SGLT-2 inhibitor (see above in DM management) • Change lisinopril to sacubitril/valsartan ○ Sacubitril 49 mg/valsartan 51 mg BID. Double dose after ~2 to 4 weeks to maintenance dose of sacubitril 97 mg/valsartan 103 mg BID as tolerated • Add spironolactone 12.5 to 25 mg daily. Double dose every 4 weeks as tolerated to maximum dose of 50 mg daily	Therapeutic Goals: • Reduce mortality • Prevent hospitalization • Improve QOL Monitoring Parameters: • SCr • Ensure 36 hour washout period with ACEi prior to initiation of ARNi • Potassium • BP
Hypertension	**3**	Assess effectiveness in HF regimen changes. If BP goals still not met after optimizing doses, initiation of a thiazide would be the preferred next step due to chronic kidney disease Acceptable thiazide diuretic options: • Chlorthalidone 12.5 to 25 mg PO daily (PREFERRED) • Hydrochlorothiazide 12.5 to 25 mg PO daily • Indapamide 1.25 to 2.5 mg PO daily	Therapeutic Goals: • <130/80 mm Hg • Reduce risk of morbidity and mortality related to complications of hypertension Monitoring Parameters: • BP • HR • BMP
Chronic Kidney Disease	**3**	• Avoid nephrotoxic drugs • Continue ACEi or ARB for proteinuria ○ Sacubitril/valsartan would ideally be utilized from a heart failure perspective; however, if not changed in the heart	Therapeutic Goals: • Prevent progression of kidney disease Monitoring Parameters: • SCr

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters
		failure section, ACE inhibitor therapy would also be appropriate • Initiate SGLT-2 inhibitor as above to prevent progression of kidney disease	• BUN • Urine albumin-to-creatinine ratio • BMP • Phosphorous

ASCVD prevention		• Initiate statin therapy
		  ○ Chronic kidney disease is an indication for statin therapy
		  ○ Diagnosis of diabetes and 10-year ASCVD risk score of 63.9% are indications for high-intensity statin
		  ○ Appropriate options include:
		  ▪ Rosuvastatin 20 to 40 mg PO daily
		  ▪ Atorvastatin 40 to 80 mg PO daily
			Therapeutic Goals:
			• ASCVD risk reduction
			• LDL decrease by at least 50%
			
			Monitoring Parameters:
			• Fasting lipid panel in 4 to 12 weeks
			• Signs or symptoms of hepatotoxicity
			• Signs or symptoms of muscular toxicity

Osteoarthritis	**3**	Recommend discontinuation of ibuprofen and initiation of a new regimen (any of the options listed below would be acceptable but topical NSAID and intraarticular glucocorticoids have the strongest recommendations)
		• Topical NSAID (any of the options below)
		  ○ Diclofenac 1% gel: apply 4 g to affected area up to 4 times daily. Maximum dose per joint is 16 g/day. Maximum total body dose is 32 g/day
		  ○ Diclofenac 1.5% solution: apply 40 drops to each affected knee up to 4 times daily. Apply 10 drops at a time, rub in evenly, then apply 10 more drops until a total of 40 drops has been applied.
		  ○ Diclofenac solution 2%: apply 40 mg (2 pump actuations) to each affected knee up to twice daily
		• Intraarticular glucocorticoid injection (any of the options below)
		  ○ Triamcinolone acetonide: 5 to 40 mg
		  ○ Triamcinolone hexacetonide: 10 to 20 mg
		  ○ Methylprednisolone acetate: 20 to 80 mg
		  ○ Betamethasone acetate and betamethasone sodium phosphate: 6 mg
		  ○ Dexamethasone: 2 to 4 mg
		  *No specific frequency. Anywhere from every 2 to 24 weeks is reasonable
		• Topical capsaicin
			Therapeutic Goals:
			• Optimize joint pain control
			• Reduce utilization of oral NSAIDs
			
			Monitoring Parameters:
			• Pain
			
			Monitoring (topical NSAID)
			*Minimal systemic absorption
			• CBC
			• Liver enzymes
			• Renal function
			• Occult blood loss
			• Blood pressure
			
			Monitoring acetaminophen
			• Liver enzymes if prolonged use
			• Ensure not exceeding 4 g/day
			
			Monitoring tramadol
			• Signs of CNS depression (mental status changes, declining respiratory function)

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters
		○ Cream, gel, liquid, lotion: apply thin film to affected areas 3 to 4 times daily OR ○ Patch: 0.025%, 0.03%, 0.0375%: Apply 1 patch to affected area for up to 8 hours (maximum 4 patches/day); do not use for >5 consecutive days • Acetaminophen ○ 325 to 650 mg PO every 4 to 6 hours as needed for pain OR ○ 1000 mg PO every 6 hours as needed for pain *Do not exceed 4 g/day • Non-pharmacologic therapy (e.g., physical therapy, exercise, self-efficacy and self-management programs, weight loss, tai chi, cane utilization, tibiofemoral brace)	• BG if hypoglycemia expected • Misuse/abuse • BP and HR • Signs/symptoms of serotonin syndrome • Signs/symptoms of hyponatremia • Seizures • GI symptoms Monitoring duloxetine • BP • Liver and renal function tests • Psychological/behavioral changes • Serum sodium • Blood glucose • Seizures • Signs/symptoms of serotonin syndrome • GI symptoms
Immunizations	**3**	• Pneumococcal vaccination ○ PCV 20 ○ PCV15 followed by PPSV23 at least 1 year after PCV15 dose • Shingrix 0.5 mL IM x1 à 0.5mL IM x1 2-6 months after first dose • Inactivated seasonal influenza vaccine IM x1 • Respiratory syncytial virus vaccine 0.5 mL IM x1	Therapeutic Goals: Prevent pneumococcal bacterial infection,herpes zoster (shingles), and respiratory syncyntial virus influenza Monitoring Parameters: • Signs and symptoms of allergic reaction 15 minutes after each vaccine • Injection site reaction (redness, pain, swelling) • RSV: headache, muscle pain, nausea, fatigue, injection site reactions

2023
ASHP National Clinical Skills Competition℠
SUPPLEMENTAL NOTES FOR JUDGES

2023 ASHP CLINCIAL SKILLS COMPETITION – NATIONAL CASE SUPPLEMENTAL NOTES FOR JUDGES

The primary problem is hemorrhagic stroke in the setting of warfarin therapy with supratherapeutic INR. Students will need to work through appropriate management of patients with hemorrhagic stroke, including anticoagulation reversal and acute blood pressure management.

Problems to address while hospitalized and upon discharge include atrial fibrillation, diabetes mellitus, CKD, peptic ulcer disease, VTE prophylaxis, heart failure, hypertension, osteoarthritis, and immunizations.

Health Care Problem 1

Intracerebral hemorrhage with supra therapeutic INR

Patient presented with an intracerebral hemorrhage (ICH) as identified by CT scan. This is most likely the result of uncontrolled hypertension in the setting of a supra therapeutic INR (likely the result of drug-interaction with H. pylori therapy). Given that it is an anticoagulation-associated ICH, anticoagulation should be discontinued and reversed as soon as possible.[1]

Several options exist for reversal of vitamin K antagonists (VKA) but the preferred reversal strategy in the setting of a major bleed at a critical site, such as the case of an ICH, is IV vitamin K and 4-factor prothrombin complex concentrate (4F-PCC). Vitamin K should be dosed as 10 mg IV given over 10-30 minutes. IV administration effects a more predictable and rapid reduction in the INR (4 to 6 hours) compared with oral (18 to 24 hours) or subcutaneous (unpredictable and not recommended) administration.[2]

Because VKA reversal is not immediate with IV vitamin K, reversal should also include PCCs (4-factor preferred to 3-factor). PCC is preferred to fresh frozen plasma (FFP) due to a much smaller volume of fluid as PCCs contain ~25 times the concentration of vitamin-K dependent clotting factors as FFP. Additionally, reversal is more efficient with PCCs compared to FFP as they can be given at a much faster infusion rate (~8 times as fast) and do not require thawing as is the case for FFP. 4F-PCC can be dosed based on weight or as a fixed dose. Appropriate weight-based dosing would be 50 units/kg with maximum dose of 5,000 units and appropriate fixed-dosing would be 1,500 units.[2]

Health Care Problem

Hypertensive emergency

Patient presented with blood pressure of 195/108 mmHg and ICH which classifies him as having hypertensive emergency. Per the AHA spontaneous ICH guidelines, SBP should be lowered to goal range of 130-150 mmHg. Elevated BP on presentation is associated with greater hematoma expansion, neurologic deterioration, death, and dependency. Large fluctuation in BP and acute lowering of SBP <130 mmHg are also potentially harmful.[1] Cerebral perfusion pressure is calculated as mean arterial pressure – intracranial pressure so dropping BP too low can decrease cerebral perfusion pressure. Additionally, our patient already has AKI so we would want to avoid additional insult in the form of decreased renal perfusion.

Our choice of antihypertensive would ideally be a titratable continuous infusion. Bolus dosing could result in fluctuations in BP. Ideal antihypertensives would be either nicardipine or clevidipine. Continuous infusions of beta-blockers may result in bradycardia with concomitant amiodarone infusion. Venous vasodilators such as nitroglycerin and nitroprusside may be harmful because of unopposed venodilation and its effect on hemostasis.[1,3]

There are several potential benefits of clevidipine over nicardipine which include more favorable pharmacokinetics (more rapid onset and shorter half-life) and less volume since it is a lipid emulsion preparation. However, there is not any compelling evidence that this translates into improved clinical outcomes. While the shorter half-life of clevidipine may result in decreased risk of over-correction of BP, it may increase the risk of rebound hypertension. Additionally, the titration instructions of clevidipine are initially more labor-intensive than that of nicardipine.[3,4] Ultimately, either clevidipine or nicardipine are appropriate options.

Health Care Problem

Atrial fibrillation

Patient has a PMH of atrial fibrillation and presented with atrial fibrillation with rapid ventricular response Per cardiology's recommendation, patient is to be initiated on amiodarone. Patient is NPO so must be initiated on IV amiodarone (see answer key for appropriate IV dosing). A HR goal of <110 BPM is appropriate for the patient as they do not have deterioration of left ventricular function, symptom, concomitant cardiac resynchronization therapy, or tachycardia-mediated cardiomyopathy[5,6,7]. Among the many monitoring parameters for amiodarone, QTc should be of concern with H. pylori treatment regimen.

The patient is on carvedilol at home but is NPO. Carvedilol should be resumed once the patient is able to take enteral medications.

The patient has nonvalvular A-fib and a CHA2DS2-VASc score of 6. He is at high risk for stroke and is ineligible for a Watchman device due to his history of patent foramen ovale. A DOAC would be preferred to warfarin in this patient and should be initiated on such once able to resume anticoagulation.[6,7] Given the patient's ICH, therapeutic anticoagulation should be held for ~ 7 to 8 weeks.[1]

Health Care Problem

Diabetes mellitus

Patient's blood glucose on presentation is uncontrolled beyond what is indicated by his hemoglobin A1c. This is likely a result of his critical illness. Considering his uncontrolled hyperglycemia, NPO status, and critical illness, the best management for this patient is to initiate an insulin infusion. There are a multitude of insulin infusion protocols but the students should utilize the initial dosing protocol in the case to determine the starting dose. The insulin utilized for a continuous infusion should be IV regular insulin. Maintaining a BG goal of 140-180 mg/dL should be the goal of the insulin infusion as more aggressive goals (ex 80-110 mg/dL) have been associated with higher incidence of hypoglycemia.[9]

Once the patient has been controlled on a stable rate of insulin, the patient can be transitioned from IV to SQ insulin regimen. The total daily insulin requirement from the insulin infusion should be calculated by extrapolating the average rate of the last 6 hours (assuming that it is a stable dose) to a 24 hour requirement. This should then be multiplied by 0.8 (take 80% of 24 hour insulin infusion requirements). The appropriate regimen is dependent upon whether the patient is eating. If not, the entire dose can be given as long-acting. If they are eating, then half of the regimen should be given as long-acting with the other half as rapid-acting divided into 3 meal-time doses. When transitioning the patient from IV to SQ insulin, the long-acting insulin should be given at least 2 hours prior to stopping the infusion so as to prevent rebound hyperglycemia.[9,10]

Ex conversion: patient's insulin infusion has been running at 1.8-2.2 units/hour for the last 6 hours. The average dose=2 units/hr so the daily dose would be 48 units. 80% of the daily insulin infusion requirements=38 units. If not eating, give all 38 units as long-acting once daily. If eating, 19 units as long-acting once daily and 6 units as rapid-acting TID with meals.

Metformin will be held until patient is able to take enteral medications. Would be reasonable to hold during hospitalization and resume at discharge. Patient has an A1c of 7.8%, the patient will need optimization of his antihyperglycemic regimen. Initiation of an SGLT-2 inhibitor (empagliflozin or dapagliflozin) would be most appropriate given his comorbidity of HFrEF and CKD.

Health Care Problem
Chronic kidney disease

Health Care Problem
Peptic ulcer disease[13-16]
The patient was recently diagnosed with H. pylori and initiated on clarithromycin triple therapy 3 days ago. Additionally, the patient chronically uses NSAIDs for his osteoarthritis. The patient was placed NPO and does not have enteral access and thus cannot receive his H. pylori therapy. Initiation of eradication therapy is not an immediate priority. Patients have usually had H. pylori for years so starting antibiotics is not an emergency. However, the patient has gotten 3 days of therapy and it is unknown how long it will be before enteral administration of medications is possible. Withholding antibiotic therapy until this time could increase the likelihood of developing resistance with an incomplete course of therapy.

Azithromycin and erythromycin have little efficacy against H. pylori and clarithromycin does not have an IV formulation so the regimen would need to be changed. Considering the need for IV therapies, our options are somewhat limited. One potential regimen consists of levofloxacin (renally dose adjusted as shown on the answer key), ampicillin (renally dose adjusted as shown on the answer key) and a PPI (equivalent to omeprazole 40 mg BID as show on the answer key). This is an IV alternative for an established enteral regimen consisting of levofloxacin 500 mg daily, amoxicillin 1000 mg BID, and PPI BID. The patient could be switched to the oral regimen) once able to administer enteral medications. Alternatively, a recent study was just published that concluded an IV regimen of levofloxacin 500 mg daily, metronidazole 200 mg Q12H, and esomeprazole 20 mg Q8H for 7 days was an effective regimen for patients unable to take enteral medications. In the answer key, I have included a range of acceptable metronidazole doses in case students choose this regimen. The metronidazole dose studied was much lower than typical H. pylori regimens that include metronidazole so it would be reasonable if a student chose a higher dose than what was studied.[17]

Health Care Problem
VTE prophylaxis
Although therapeutic anticoagulation should not be given for several weeks, the patient will require VTE prophylaxis. At the time of admission, IPC devices should be utilized. Pharmacologic VTE prophylaxis should be initiated within 48 to 96 hours as long as the bleed is stable.[1,18] Enoxaparin is generally preferred for VTE prophylaxis over heparin.[19]

Health Care Problem
Heart failure with reduced ejection fraction[20]
Patient has a PMH of HFrEF but does not have an optimized home regimen based on guideline recommendations. Patient should be initiated on an SGLT-2 inhibitor (see diabetes section) once able to take PO. Additional optimization includes adding spironolactone and changing ACEi therapy to sacubitril-valsartan with appropriate washout-period.

Health Care Problem
Hypertension[21]

Patient has a PMH of hypertension, which is uncontrolled based on his presentation with hypertensive emergency. The recommended optimization of the patient's HFrEF regimen described above will have effects on the patient's BP. If BP is not controlled after optimizing this regimen, a DHP calcium channel blocker such as amlodipine or a thiazide diuretic such as chlorthalidone should be the next step.

Health Care Problem

Chronic Kidney Disease [22]

Patient has chronic kidney disease stage G3B A2 (GFR of 35 mL/min using 2021 CKD-Epi) (CrCl of 41 mL/min using Cockcroft-Gault). Ideally, the patient should have been placed on sacubitril/valsartan to optimize his heart failure regimen. However, from the standpoint of proteinuria, utilizing either and ACEi or an ARB is appropriate; so if the student keeps the patient on home lisinopril that is also fine. SGLT-2 inhibitors (see diabetes mellitus and heart failure sections) have shown benefit in reducing progression of chronic kidney disease.

Health Care Problem

ASCVD prevention [23, 24]

Patients ≥50 years of age and GFR ≤ 60 mL/min (not on dialysis or with transplantation) should be initiated on statin therapy. The patient also has diabetes and an estimated 10-year ASCVD risk score of 63.9%. Given this, patient should be initiated on a high-intensity statin.

Health Care Problem

Osteoarthritis[25]

The patient has chronic utilization of NSAIDs for his osteoarthritis but his recent diagnosis of peptic ulcer disease makes this an undesired therapy. The alternative therapies that would likely be the most effective would be topical NSAIDs or intraarticular glucocorticoid injections. Topical capsaicin and oral acetaminophen would be relatively safe options but may not be effective. Tramadol and duloxetine are additional possible alternatives but the potential adverse effects of these medications make them less desirable. Non-pharmacologic therapies should be encouraged as able.

Health Care Problem

Immunizations[26]

Based on patient's age and vaccination status, pneumococcal and zoster vaccines should be recommended. RSV is also recommended given his diagnosis of diabetes and age > 60 yrs. Patient has not yet received his recommended annual influenza vaccination.

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ASHP NATIONAL CLINICAL SKILLS COMPETITION - 2023

Evaluator Score Sheet - Written

Team:
Evaluator:
FINAL SCORE: **%**

Pts.		PROBLEM IDENTIFICATION & PRIORITIZATION (30 points)	
		Priority 1 - Most urgent problem (there can only be one)	
15 pts	☐	Intracerebral hemorrhage with supra therapeutic INR	_____/15
		Priority 2 - Problems to be addressed immediately or during this clinical encounter	
2.4 pts	☐	Hypertensive emergency	
2.4 pts	☐	Atrial fibrillation	
2.4 pts	☐	Diabetes mellitus	
2.4 pts	☐	Peptic ulcer disease	
2.4 pts	☐	VTE prophylaxis	_____/12
		Priority 3 - Problems to be addressed later (e.g. 1+ week later and/or at discharge or next follow-up visit)	
0.5 pts	☐	Heart failure with reduced ejection fraction	
0.5 pts	☐	Hypertension	
0.5 pts	☐	Chronic Kidney Disease	
0.5 pts	☐	ASCVD prevention	
0.5 pts	☐	Osteoarthritis	
0.5 pts	☐	Immunizations	_____/3
			TOTAL _____**/30**

		PRIORITY 1 (40 POINTS)	
		[Intracerebral hemorrhage with supra therapeutic INR - 1]	
		RECOMMENDATIONS FOR THERAPY	
12.5 pts	☐	Vitamin K 10 mg IV *Reference: Given over 10-30 minutes; not to exceed 1 mg/minute*	
12.5 pts	☐	**PICK ONLY ONE OPTION** 4-factor prothrombin complex concentrate o Fixed dose: 1500 units IV x1 dose *Reference: Administer at a rate of 0.12 mL/kg/min (~3 units/kg/minute), max rate of 8.4 mL/minute (~210 units/minute)* ***OR*** o Weight-based: 50 units/kg (4,500 to 5,000 units) IV x 1 dose *Reference: Administer at a rate of 0.12 mL/kg/min (~3 units/kg/minute), max rate of 8.4 mL/minute (~210 units/minute)*	_____/25
		Comments:	
		THERAPEUTIC GOALS	
2.5 pts	☐	Rapid reversal of anticoagulation	
2.5 pts	☐	Prevent worsening hemorrhage	
		MONITORING PARAMETERS	
2 pts	☐	INR	
2 pts	☐	CBC	
2 pts	☐	CT Scan	
2 pts	☐	Signs or symptoms of thromboembolism	
2 pts	☐	Signs or symptoms of worsening bleeding	
			_____/15
		Comments:	
			TOTAL _____**/40**

PRIORITY 2 (20 POINTS)

[Hypertensive emergency - 2]

RECOMMENDATIONS FOR THERAPY

1 pt ☐ **PICK ONLY ONE OPTION**

Parenteral antihypertensive agent initiated within 2 hours of presentation
- o Nicardipine: Initiate at 5 mg/hour; titrate by 2.5 mg/hour every 5 to 15 minutes to maintain BP goal. Maximum dose of 15 mg/hour.

OR

- o Clevidipine: Initiate at 1 to 2 mg/hour; titrate by doubling the dose every 90 seconds. As BP approaches goal, titrate by smaller increments to achieve BP goal. Maximum dose of 21 mg/hour.

Note: venous vasodilators would not be a suitable option. Cardiology wants to pursue rhythm control so a continuous beta-blocker could precipitate bradycardia.

THERAPEUTIC GOALS

1 pt ☐ SBP 130 to 150 mm Hg within 1 hour of initiation of treatment

MONITORING PARAMETERS

1 pt ☐ BP

1 pt ☐ HR

[Atrial fibrillation - 2]

RECOMMENDATIONS FOR THERAPY

Rate/rhythm control

1 pt ☐ **PICK ONLY ONE OPTION**

- Amiodarone 150 mg IV bolus given over 10 to 30 minutes, followed by 1 mg/min infusion x6 hours, followed 0.5 mg/min infusion

OR

- Amiodarone 300 mg IV bolus over 1 hour, followed by 10 to 50 mg/hour

1 pt ☐ Switch to oral amiodarone when able to take enteral medications

1 pt ☐ Provide a total loading dose of 6-10 g (total IV and PO doses)
- o Once switched to PO, finish remainder of loading dose with a higher dosing regimen (400 to 1200 mg/day in divided doses)

1 pt ☐ Maintenance dose of amiodarone 100 to 200 mg PO daily

Beta Blocker

1 pt ☐ Unable to take home dose of carvedilol 25 mg BID while NPO. Resume when able to take enteral medications.

Anticoagulation

1 pt ☐ Hold therapeutic anticoagulation for 7 to 8 weeks after bleed

1 pt ☐ **PICK ONLY ONE OPTION**

Afterwards, resume anticoagulation with a DOAC (CHA2DS2-VASc score of 6)
- o Apixaban 5 mg PO BID

OR

- o Rivaroxaban 20 mg PO daily

OR

- o Edoxaban 60 mg PO daily

OR

- o Dabigatran 150 mg PO BID

THERAPEUTIC GOALS

1 pt ☐ Maintain resting HR <110 BPM; however, if patient develops deterioration of left ventricular function, a stricter goal of <80 BPM would be appropriate

1 pt ☐ Maintain normal sinus rhythm with amiodarone

1 pt ☐ Prevention of stroke

MONITORING PARAMETERS

amiodarone

1 pt ☐ Liver function tests

1 pt ☐ Pulmonary toxicity

1 pt ☐ Regular ophthalmic exams

1 pt ☐ Telemetry (arrhythmias, QTc)

1 pt ☐ Electrolytes

1 pt ☐ HR and BP

1 pt ☐ Thyroid function

carvedilol

1 pt ☐ HR and BP

DOAC

1 pt ☐ Signs or symptoms of bleeding

1 pt ☐ SCr

[Diabetes mellitus - 2]

RECOMMENDATIONS FOR THERAPY

1 pt ☐ Initiate titratable insulin infusion (preferred therapy in the setting of critical illness and uncontrolled hyperglycemia):
- o Regular insulin IV. Per hospital protocol, start infusion at 4 units/hour.
- o Maintain goal BG of 140-180 mg/dL

1 pt ☐ Transition to subcutaneous basal or basal + bolus insulin regimen once on a stable insulin infusion rate and within goal for at least 6 hours
- o Calculate 24 hour insulin requirement from insulin infusion
- o May extrapolate 24 hour requirements from the last 6 hours
- o Take 60-80% of 24 hour insulin infusion to calculate subcutaneous insulin dose

1 pt ☐ **PICK ONLY ONE OPTION**

If patient is still NPO:
- o Give all as long-acting insulin (glargine, detemir, or degludec). Administer dose at least 2 hours prior to stopping infusion. Administer dose subcutaneously once daily (BID reasonable for detemir).

If patient is eating:
- o Give half of calculated dose as long-acting (see above). Administer long-acting as above prior to stopping infusion. Divide the remainder of the total daily dose by three and administer as rapid-acting (lispro, aspart, glusiline) with meals. Administer rapid-acting subcutaneouslyright before meals or immediately following meals if patient has unreliable oral intake.

1 pt ☐ Resume home dose of metformin (1000 mg PO BID) once able to take enteral medications

1 pt ☐ Add SGLT-2 inhibitor once able to take enteral medications
- o Dapagliflozin 10 mg PO daily

OR
- o Empagliflozin 10 mg PO daily

THERAPEUTIC GOALS

1 pt ☐ BG of 140-180 mg/dL while in hospital

1 pt ☐ HbA1c goal of <7% as an outpatient

MONITORING PARAMETERS

1 pt ☐ BG

1 pt ☐ SCr

1 pt ☐ Signs or symptoms of ketoacidosis (SGLT-2 inhibitor)

[Peptic ulcer disease - 2]

RECOMMENDATIONS FOR THERAPY

***H. pylori* treatment**

Patient is NPO and cannot receive current *H. pylori* regimen without enteral access

1 pt ☐ **PICK ONLY ONE OPTION**

Without enteral access, an IV regimen should be given which could include:

- PPI BID
  - o Esomeprazole 20 mg IV BID

  OR
  - o Pantoprazole 40 mg to 80 mg IV BID
- Levofloxacin 500 mg IV initial dose, then 250 mg every 24 hours (renally dose adjusted for 500 mg daily). Administer dose over 60 minutes
- Ampicillin 2 g IV Q8 hours (renally dose adjusted for 2 g Q6 hours)
- Total duration of H. pylori regimen is 14 days
- If able to take enteral medications prior to completion of H. pylori therapy regimen, may complete remaining duration with enteral medications:
  - o Levofloxacin 250 mg PO daily (1:1 IV:PO dose conversion)
  - o Amoxicillin 1000 mg PO BID
  - o PPI (any of the enteral options listed below)

OR

- Esomeprazole 40 mg IV Q8H
- Levofloxacin 500 mg IV initial dose, then 250 mg every 24 hours (renally dose adjusted for 500 mg daily). Administer dose over 60 minutes
- Metronidazole 200 mg to 500 mg IV Q8 to Q12H
- Total duration of regimen is 7 to 14 days
- If able to take enteral medications prior to prior to completion of H. pylori therapy regimen, may complete remaining duration with enteral medications:
  - o Levofloxacin 250 mg PO daily (1:1 IV:PO dose conversion)
  - o Metronidazole 250 mg to 500 mg PO Q8 to Q12H
  - o PPI (any of the enteral options listed below

1 pt ☐ Continue PPI for duration of therapy for H. pylori treatment and could extend treatment 4 to 8 weeks if needed based on clinical response

- Appropriate doses include:
  - o omeprazole 40 mg PO BID
  - o lansoprazole 30 mg to 60 mg PO BID
  - o rabeprazole 20 mg PO BID
  - o esomeprazole 20 mg PO BID
  - o pantoprazole 40 to 80 mg PO BID

NSAIDs

1 pt ☐ • Discontinue aspirin- patient does not have an indication

1 pt ☐ • Recommend discontinuation of ibuprofen

THERAPEUTIC GOALS

1 pt ☐ Eradication of *H. pylori*

1 pt ☐ Prevent gastric cancer

1 pt ☐ Symptom relief

MONITORING PARAMETERS

1 pt ☐ Test to prove eradication of H. pylori at least 4 weeks after completing antibiotics and at least 1 to 2 weeks after PPI has been withheld

1 pt ☐ Symptoms of PUD such as abdominal pain

1 pt ☐ QTc via ECG with concomitant levofloxacin and amiodarone

[VTE prophylaxis - 2]

RECOMMENDATIONS FOR THERAPY

1 pt ☐ Initiate mechanical VTE prophylaxis with intermittent pneumatic compression device at the time of hospitalization
Initiate pharmacologic VTE prophylaxis 48-96 hours after symptom onset if bleed has stabilize

1 pt ☐ **PICK ONLY ONE OPTION**

o Heparin 5000 units subcutaneously BID or TID

OR

o Enoxaparin 40 mg subcutaneously daily

THERAPEUTIC GOALS

1 pt ☐ Prevention of VTE

MONITORING PARAMETERS

1 pt ☐ Signs or symptoms of bleeding

1 pt ☐ CBC

1 pt ☐ SCr (if enoxaparin is chosen)

Recommendations for Therapy

MOST (≥75%) recommendations for therapy are accurate, complete and are drug-, disease- and patient-specific = 15
SOME (50-74%) recommendations for therapy are accurate, complete and are drug-, disease- and patient-specific = 10
FEW (<50%) recommendations for therapy are accurate, complete and are drug-, disease- and patient-specific = 5
NONE Recommendations for therapy are missing or are consistently incorrect, inappropriate and/or non-specific = 0 _____/15

Comments:

Therapeutic Goals & Monitoring Parameters

MOST (≥75%) goals of therapy are accurate, complete and are drug-, disease- and patient-specific = 5
SOME (50-74%) goals of therapy are accurate, complete and are drug-, disease- and patient-specific = 3
FEW (<50%) goals of therapy are accurate, complete and are drug-, disease- and patient-specific = 1
NONE Goals of therapy are missing or are consistently incorrect, inappropriate and/or non-specific = 0 _____/5

Comments:

TOTAL _____/20

PRIORITY 3 (10 POINTS)

[Heart failure with reduced ejection fraction - 3]

RECOMMENDATIONS FOR THERAPY

Optimization of GDMT once able to take enteral medications

Add SGLT-2 inhibitor (see above in DM management)

**Scored previously under diabetes mellitus [priority 2]*

1 pt ☐ Change lisinopril to sacubitril/valsartan
- o Sacubitril 49 mg/valsartan 51 mg BID. Double dose after ~2 to 4 weeks to maintenance dose of sacubitril 97 mg/valsartan 103 mg BID as tolerated

1 pt ☐ Add spironolactone 12.5 to 25 mg daily. Double dose every 4 weeks as tolerated to maximum dose of 50 mg daily

THERAPEUTIC GOALS

1 pt ☐ Reduce mortality

1 pt ☐ Prevent hospitalization

1 pt ☐ Improve QOL

MONITORING PARAMETERS

1 pt ☐ SCr

1 pt ☐ Ensure 36 hour washout period with ACEi prior to initiation of ARNi

1 pt ☐ Potassium

1 pt ☐ BP

[Hypertension - 3]

RECOMMENDATIONS FOR THERAPY

Assess effectiveness in HF regimen changes. If BP goals still not met after optimizing doses, initiation of a thiazide would be the preferred next step due to chronic kidney disease.

Acceptable thiazide diuretic options:

1 pt ☐ **PICK ONLY ONE OPTION**
- Chlorthalidone 12.5 to 25 mg PO daily (PREFERRED)

OR
- Hydrochlorothiazide 12.5 to 25 mg PO daily

OR
- Indapamide 1.25 to 2.5 mg PO daily

THERAPEUTIC GOALS

1 pt ☐ <130/80 mm Hg

1 pt ☐ Reduce risk of morbidity and mortality related to complications of hypertension

MONITORING PARAMETERS

1 pt ☐ BP

1 pt ☐ HR

1 pt ☐ BMP

[Chronic Kidney Disease - 3]

RECOMMENDATIONS FOR THERAPY

1 pt ☐ Avoid nephrotoxic drugs

1 pt ☐ Continue ACEi or ARB for proteinuria
- o Sacubitril/valsartan would ideally be utilized from a heart failure perspective; however, if not changed in the heart
  Initiate SGLT-2 inhibitor as above to prevent progression of kidney disease

**Scored previously under diabetes mellitus [priority 2]*

THERAPEUTIC GOALS

1 pt ☐ Prevent progression of kidney disease

MONITORING PARAMETERS

1 pt ☐ SCr

1 pt ☐ BUN

1 pt ☐ Urine albumin-to-creatinine ratio

1 pt ☐ BMP

1 pt ☐ Phosphorous

[ASCVD prevention - 3]

RECOMMENDATIONS FOR THERAPY

1 pt ☐ Initiate statin therapy
- Chronic kidney disease is an indication for statin therapy
- Diagnosis of diabetes and 10-year ASCVD risk score of 63.9% are indications for high-intensity statin
- Appropriate options include:
  - o Rosuvastatin 20 to 40 mg PO daily
  - o Atorvastatin 40 to 80 mg PO daily

THERAPEUTIC GOALS

1 pt ☐ ASCVD risk reduction

1 pt ☐ LDL decrease by at least 50%

MONITORING PARAMETERS

1 pt ☐ Fasting lipid panel in 4 to 12 weeks

1 pt ☐ Signs or symptoms of hepatotoxicity

1 pt ☐ Signs or symptoms of muscular toxicity

[Osteoarthritis - 3]

RECOMMENDATIONS FOR THERAPY

Recommend discontinuation of ibuprofen and initiation of a new regimen (any of the options listed below would be acceptable but topical NSAID and intraarticular glucocorticoids have the strongest recommendations)

1 pt ☐ **PICK ONLY ONE OPTION**
- Topical NSAID (any of the options below) PREFERRED
  - o Diclofenac 1% gel: apply 4 g to affected area up to 4 times daily. Maximum dose per joint is 16 g/day. Maximum total body dose is 32 g/day
  - o Diclofenac 1.5% solution: apply 40 drops to each affected knee up to 4 times daily. Apply 10 drops at a time, rub in evenly, then apply 10 more drops until a total of 40 drops has been applied.
  - o Diclofenac solution 2%: apply 40 mg (2 pump actuations) to each affected knee up to twice daily

OR
- Intraarticular glucocorticoid injection (any of the options below) PREFERRED
  - o Triamcinolone acetonide: 5 to 40 mg
  - o Triamcinolone hexacetonide: 10 to 20 mg
  - o Methylprednisolone acetate: 20 to 80 mg
  - o Betamethasone acetate and betamethasone sodium phosphate: 6 mg
  - o Dexamethasone: 2 to 4 mg
    *No specific frequency. Anywhere from every 2 to 24 weeks is reasonable

OR
- Topical capsaicin
  - o Cream, gel, liquid, lotion: apply thin film to affected areas 3 to 4 times daily

  OR
  - o Patch: 0.025%, 0.03%, 0.0375%: Apply 1 patch to affected area for up to 8 hours (maximum 4 patches/day); do not use for >5 consecutive days

OR
- Acetaminophen
  - o 325 to 650 mg PO every 4 to 6 hours as needed for pain

  OR
  - o 1000 mg PO every 6 hours as needed for pain
    *Do not exceed 4 g/day

OR
- Non-pharmacologic therapy (e.g., physical therapy, exercise, self-efficacy and self-management programs, weight loss, tai chi, cane utilization, tibiofemoral brace)

THERAPEUTIC GOALS

1 pt ☐ Optimize joint pain control

1 pt ☐ Reduce utilization of oral NSAIDs

MONITORING PARAMETERS

1 pt ☐ Pain

1 pt ☐ Monitoring plan for selected therapy

Topical NSAID

*Minimal systemic absorption

- o CBC
- o Liver enzymes
- o Renal function
- o Occult blood loss
- o Blood pressure

acetaminophen

- o Liver enzymes if prolonged use
- o Ensure not exceeding 4 g/day

tramadol

- o Signs of CNS depression (mental status changes, declining respiratory function)
- o Misuse/abuse
- o BP and HR
- o Signs/symptoms of serotonin syndrome
- o Signs/symptoms of hyponatremia
- o Seizures
- o GI symptoms

duloxetine

- o BP
- o Liver and renal function tests
- o Psychological/behavioral changes
- o Serum sodium
- o Blood glucose
- o Seizures
- o Signs/symptoms of serotonin syndrome
- o GI symptoms

[Immunizations - 3]

RECOMMENDATIONS FOR THERAPY

1 pt ☐ Pneumococcal vaccination
- o PCV 20
- o PCV15 followed by PPSV23 at least 1 year after PCV15 dose

1 pt ☐ Shingrix 0.5 mL IM x1 à 0.5mL IM x1 2-6 months after first dose

1 pt ☐ Inactivated seasonal influenza vaccine IM x1

1 pt ☐ Respiratory syncytial virus vaccine 0.5 mL IM x1

THERAPEUTIC GOALS

1 pt ☐ Prevent pneumococcal bacterial infection,herpes zoster (shingles), and respiratory syncyntial virus

MONITORING PARAMETERS

1 pt ☐ Signs and symptoms of allergic reaction 15 minutes after each vaccine

1 pt ☐ Injection site reaction (redness, pain, swelling)

1 pt ☐ RSV: headache, muscle pain, nausea, fatigue, injection site reactions

Recommendations for Therapy

MOST (≥75%) recommendations for therapy are accurate, complete and are drug-, disease- and patient-specific = 5
SOME (50-74%) recommendations for therapy are accurate, complete and are drug-, disease- and patient-specific = 3
FEW (<50%) recommendations for therapy are accurate, complete and are drug-, disease- and patient-specific = 1
NONE Recommendations for therapy are missing or are consistently incorrect, inappropriate and/or non-specific = 0 _____/5

Comments:

Therapeutic Goals and Monitoring Parameters

MOST (≥75%) goals of therapy are accurate, complete and are drug-, disease- and patient-specific = 5
SOME (50-74%) goals of therapy are accurate, complete and are drug-, disease- and patient-specific = 3
FEW (<50%) goals of therapy are accurate, complete and are drug-, disease- and patient-specific = 1
NONE Goals of therapy are missing or are consistently incorrect, inappropriate and/or non-specific = 0 _____/5

Comments:

TOTAL _____/10

(100 POINTS + ANY BONUS) FINAL TOTAL SCORE _____/100

Comments: