

NATIONAL CASE
2022 ASHP CLINICAL SKILLS COMPETITION

Demographic and Administrative Information

Name: Hector Garcia	Patient ID: 4556151
Sex: Male	Room & Bed: Gen Med-1201
Date of Birth: 5/1/1967	Admitting Physician: Dr. James Jenkins
Height: 5'9" / Weight: 215 lbs / Ethnicity: Hispanic	Religion: Catholic
Prescription Coverage Insurance: Private (Express Scripts)	Pharmacy: CVS
Copay: \$5/\$50/\$100	Annual Income: \$40,000

Chief Complaint

"My husband is confused"

History of Present Illness

Mr. Garcia is a 55 year old male brought to the ED by his wife due to worsening confusion at home for the last 3 days. History is provided by his wife. She noticed that the last three days he seemed to be confused about dates and where he was. Today he was talking about planning his father's funeral service (father passed away 3 years ago). She states that he is adherent to all his medications. Mrs. Garcia is afraid maybe her husband started drinking alcohol again as the reason for being confused. The last time he drank, he was involved in a motor vehicle accident that caused his traumatic brain injury leading to 2 weeks in the neuro-ICU. She was very proud of her husband when his PCP saw him two weeks ago and said everything looked good except for a low valproic acid level. His only seizure was during his admission for traumatic brain injury (24 months ago).

Past Medical History

Hypertension – (diagnosed in 2014)
 Alcoholic cirrhosis – (diagnosed in 2016)
 Esophageal varices – (diagnosed in 2020)
 Traumatic brain injury – (diagnosed in 2020)
 Ascites - (diagnosed in July 2021)
 Hepatic encephalopathy – (diagnosed February 2022)
 Diabetes (Type II) – newly diagnosed 6 weeks ago

Outpatient Drug Therapy

Prescription Medication & Schedule	Duration Start–Stop Dates	Prescriber	Pharmacy
Divalproex DR 500 mg PO BID	November 16, 2022- Present	Dr. Carlos Davidson	CVS
Metformin 500 mg PO BID	October 22, 2022-Present	Dr. Carlos Davidson	CVS
Lactulose 15 mL PO BID	February 2, 2022- Present	Dr. Carlos Davidson	CVS
Metoprolol tartrate 12.5 mg PO BID	January 1, 2022-Present	Dr. Carlos Davidson	CVS
Furosemide 40 mg PO daily	July 15, 2021-Present	Dr. Carlos Davidson	CVS
Spirolactone 50 mg PO daily	July 15, 2021-Present	Dr. Carlos Davidson	CVS
Divalproex DR 250 mg PO BID	June 1, 2021-November 15, 2022	Dr. Carlos Davidson	CVS

Non-Prescription Medication/Herbal Supplements/Vitamins	Duration Start–Stop Dates	Prescriber	Pharmacy
Acetaminophen 500 mg PO Q8H PRN headache	2010-present (last used 2 weeks ago)		CVS
Aspirin 81 mg PO daily	2014-present		CVS

Medication History

Wife denies patient missing doses- uses pill box set up by his wife weekly
Wife can provide medication, dose, frequency, and indication for all medications

Allergies/Intolerances

Phenytoin- nystagmus
Lactose intolerant

Surgical History

Endoscopy 2020- medium esophageal varices present
Craniotomy 2020- hematoma evacuation

Family History

Father- BPH, HTN, MI at age 66
Mother- breast cancer at age 55, depression, HTN

Social History

Tobacco- never smoker
Alcohol- quit 2 years ago; used to drink 12-pack of standard 12 ounce beers/day
Occupation: Painter

Immunization History

Pfizer-BioNTech vaccine: Dose #1 (1/2021), Dose #2 (2/2021)
Moderna mRNA vaccine (Booster): Dose #1 (10/2021)
Influenza: 11/2022
Pneumococcal: PCV-20 Dose #1 (1/2022)

Review of Systems (source: wife)

Constitutional: denies weight loss, fever, or chills
HEENT: denies changes in vision or hearing
Respiratory: denies new shortness of breath or cough
CV: denies any chest pain or palpitations
GI: denies diarrhea or abdominal pain; 1 BM/day (last BM 12/2/22)
GU: denies dysuria or increase urinary frequency; denies incontinence
MSK: denies myalgias or joint pain
Skin: denies rash or lesions
Neurological: worsening confusion for the last 3 days; denies headaches; denies loss of consciousness
Psychiatric: denies anxiety or depression

Physical Exam

General: obese male, mumbling incoherently; oriented x2, can be redirected
Head: scar from left temple to back of head
Eyes: PERRL, conjunctiva clear
Neck: supple, symmetrical
Neuro: CN II-XII intact
Lungs: clear to auscultation bilaterally, non-labored
CV: regular rhythm and rate, no murmur or gallop
Abdomen: distended; + fluid wave; no guarding or rebound; decreased bowel sounds
Skin: no skin lesions, cuts, or bruises; good skin turgor
Extremities: 1+ pitting edema up to mid shin bilaterally; + asterixis

Vital signs

HR: 86 bpm

RR: 16 bpm

O2 Saturation: 98% on room air

BP: 138/82 mm Hg

Temp: 97.6°F

Labs and Microbiology

	12/3/2022 @ 0754	11/16/2022 @ 0800	10/22/2022 @ 0730
Metabolic Panel			
Na (mEq/L)	136	135	137
K (mEq/L)	3.8	4.2	4.1
Cl (mEq/L)	100	102	105
CO ₂ (mEq/L)	24	21	22
BUN (mg/dL)	12	14	10
SCr (mg/dL)	0.88	0.94	0.9
Glucose (mg/dL)	154	162	190
Calcium (mg/dL)	7.4	7.6	8.1
Phosphorus (mg/dL)	3.4	3.2	3.6
Magnesium (mg/dL)	2.0	1.8	1.9
Albumin (g/dL)	2.8	2.6	3.1
AST (IU/L)	100	90	102
ALT (IU/L)	56	62	66
Total bili (mg/dL)	1.0	0.8	0.9
CBC			
WBC (thousands/mm ³)	5.9	6.1	
Hgb (g/dL)	11.9	12.3	
Hct (%)	35.1	37.2	
Plt (K/mm ³)	100	116	
Fasting Lipid Panel			
Total cholesterol (mg/dL)			216
LDL (mg/dL)			140
HDL (mg/dL)			32
Triglycerides (mg/dL)			222
Other			
Hemoglobin A1c (%)			8.6
ACR (mg/g)			12
Ammonia (mcg/dL)	130		22
INR	1.4		
Total valproic acid level (mcg/mL)	31	26	
Serum alcohol (%)	0		

Other Diagnostic Tests

12/3/2022 EEG: no acute seizure activity; slow triphasic waves

12/3/2022: Abdominal ultrasound: moderate ascites

Admission Medications	Start Date
Divalproex Delayed Release 500 mg PO TID	12/3/2022
Furosemide 40 mg PO daily	12/3/2022
Spirolactone 50 mg PO daily	12/3/2022
Lactulose 10 g /15 mL PO BID	12/3/2022
Metoprolol tartrate 12.5 mg PO BID	12/3/2022
Docusate sodium 100 mg PO daily	12/3/2022
Senna 8.6 mg PO daily	12/3/2022
Polyethylene glycol 17 g packet PO daily PRN constipation	12/3/2022

Emergency Department Notes:**Assessment: hepatic encephalopathy vs. seizures**

Patient does not appear to have an infectious source of altered mental status. Differential diagnosis includes hepatic encephalopathy vs. breakthrough seizures due to subtherapeutic valproic acid levels. However, EEG and clinical signs and symptoms are more consistent with hepatic encephalopathy.

Plan:

Admit to general medicine unit until altered mental status improves. Start bowel regimen and diuresis to help with the improvement of increased ammonia and ascites. As a member of the Internal Medicine team please address pharmacotherapy recommendations, including all home medications, you may have to optimize this patient's care in the hospital and at discharge.

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.*

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters
<p>Hepatic Encephalopathy exacerbated by Divalproex</p> <p>NOTE: "Exacerbated by Divalproex" is not required for correct problem identification–</p>	1	<p>Discontinue inpatient Divalproex order</p> <ul style="list-style-type: none"> • Further instructions in seizures section for tapering but can be addressed in primary problem <p>Correct laxatives</p> <ul style="list-style-type: none"> • Discontinue docusate, senna, and polyethylene glycol • Start lactulose 25 mL (15-45 mL acceptable) PO Q 1-2 hours until 1-2 soft bowel movements • Then start lactulose at higher dose than home dose <ul style="list-style-type: none"> ○ Option: Lactulose 30 mL PO BID-QID ○ Option: Lactulose 15 mL PO TID-QID <p>(Consider adding rifaximin after discussion with family about cost)</p>	<p>Therapeutic Goals:</p> <ul style="list-style-type: none"> • Improve mental status • Resolve asterixis • 2-3 bowel movements/day <p>Monitoring Parameters:</p> <ul style="list-style-type: none"> • Clinical signs of improvement in mental status and asterixis (neuro exam/nurse checks every 6-8 hours after bowel movements) • Bowel movements per day • Cramping • NOTE: Do not need to trend ammonia levels
<p>Seizure prophylaxis /Adverse Drug Reaction</p>	2	<p>Taper Divalproex DR</p> <ul style="list-style-type: none"> • Start to taper home Divalproex DR dose 20-25% every week <ul style="list-style-type: none"> ○ 500 mg PO QAM + 250 mg PO QPM → 250 mg PO BID → 250 mg PO daily (or 125 mg PO BID) → discontinue OR Do not initiate an antiepileptic medication <ul style="list-style-type: none"> ○ NOTE: Seizure prophylaxis is no longer necessary <p>BONUS: Document ADR to Divalproex</p>	<p>Therapeutic Goals:</p> <ul style="list-style-type: none"> • Prevent breakthrough seizures • Prevent drug-induced hepatic encephalopathy <p>Monitoring Parameters:</p> <ul style="list-style-type: none"> • Signs and symptoms of seizures
<p>Ascites</p>	2	<p>Optimize diuretics</p> <ul style="list-style-type: none"> • Increase spironolactone to 100mg PO daily • Continue furosemide 40mg PO daily 	<p>Therapeutic Goals:</p> <ul style="list-style-type: none"> • Up to 1kg/day loss or net negative ~1L/day

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters
		Dietary salt restriction <ul style="list-style-type: none"> ○ Restrict salt to <2g/day 	<ul style="list-style-type: none"> ● Decrease edema in lower extremities and abdomen (abdominal discomfort/shortness of breath) ● Avoid tense ascites/spontaneous bacterial peritonitis Monitoring Parameters: <ul style="list-style-type: none"> ● Serum potassium, magnesium, sodium, and SCr daily ● Weight daily (1kg/day) OR Urine output daily (net negative 1 L/day)
Esophageal varices	2	Primary Prophylaxis <ul style="list-style-type: none"> ● Discontinue metoprolol ● Start nonselective beta blocker (PICK 1) <ul style="list-style-type: none"> ○ Propranolol 10-20 mg PO BID ○ Carvedilol 3.125 or 6.25mg PO BID ○ Nadolol 20-40 mg PO daily At Discharge <ul style="list-style-type: none"> ● Discontinue aspirin 81 mg PO daily 	Therapeutic Goals: <ul style="list-style-type: none"> ● Prevent variceal hemorrhage ● Heart Rate: 55-60 BPM ● Systolic BP: >90 mm Hg ● BONUS: Decrease hepatic venous pressure gradient (HVPG) to ≤12 mmHg or ≥20% from baseline Monitoring Parameters: <ul style="list-style-type: none"> ● Signs and symptoms of hematemesis daily ● Blood pressure and HR Q6-8 hours ● Hemoglobin and hematocrit daily or every other day
Hypertension	2	Lifestyle Modifications: <ul style="list-style-type: none"> ● Moderate exercise most days of the week ● Weight Loss Pharmacotherapy: <ul style="list-style-type: none"> ● Start non-selective beta blocker like above ● BONUS: consider ACE-I or ARB in the future if ACR >30 mg/g and need further blood pressure lowering 	Therapeutic Goals: <ul style="list-style-type: none"> ● SBP >90 mm Hg and <130/<80 mm Hg Monitoring Parameters: <ul style="list-style-type: none"> ● Blood pressure and HR every 6-8 hours
Diabetes	2	Inpatient: <ul style="list-style-type: none"> ● Start rapid acting insulin sliding scale TIDAC and QHS for BG >180s (PICK 1) <ul style="list-style-type: none"> ○ Insulin aspart 	Therapeutic Goals (inpatient) <ul style="list-style-type: none"> ● Blood glucose 140-180 Monitoring Parameters: <ul style="list-style-type: none"> ● Blood glucose TIDAC and QHS

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters
		<ul style="list-style-type: none"> ○ Insulin glulisine ○ Insulin lispro ● Start carb controlled diet (50-75 grams of carbs/meal) <ul style="list-style-type: none"> ○ Should include non-starchy vegetables, non-fried/breaded proteins, and healthy fats ○ Avoid sugary soft drinks/teas ○ Limit dairy products ○ Avoid high sugar fruits (berries may be acceptable in limited quantity) <p>Outpatient:</p> <ul style="list-style-type: none"> ● Discontinue metformin and start GLP-1 receptor agonist (PICK 1): <ul style="list-style-type: none"> ○ Semaglutide 3 mg PO daily ≥30 minutes before the first food/drink or other medications of the day ○ Semaglutide 0.25 mg SC weekly ○ Liraglutide 0.6 mg SC daily for 1 week → 1.2 mg SC daily for a week and titrate to 1.8 mg SC daily as tolerated ○ Lixisenatide 10 mcg SC daily for 14 days → 20 mcg SC daily ○ Exenatide 5 mcg SC BID within 60 minutes prior to morning and evening meals (can increase to 10 mcg after 1 month if necessary) ○ Exenatide ER: 2 mg SC weekly ○ Dulaglutide 0.75 mg SC weekly (may increase to 1.5 mg SC weekly after 4-8 weeks if necessary) <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> ● Discontinue metformin and start basal insulin at 0.1-0.4 units/kg/day (max of 10 units/day for initial dosing) NOTE: Preferred in end stage liver disease (PICK 1) <ul style="list-style-type: none"> ○ Insulin detemir 10 units SC daily ○ Insulin detemir 5 units SC BID ○ Insulin glargine 10 units SC daily ○ Insulin degludec 10 units SQ daily <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> ● Increase metformin to 1500mg/day 	<p>Therapeutic Goals (outpatient):</p> <ul style="list-style-type: none"> ● Hemoglobin A1c: <7% or 8% ● Fasting blood glucose: 70-130 mg/dL ● Post prandial blood glucose: <180 mg/dL <p>Monitoring Parameters (increase metformin):</p> <ul style="list-style-type: none"> ● Signs and symptoms of lactic acidosis ● A1c in 3 months <p>Monitoring Parameters (start basal insulin):</p> <ul style="list-style-type: none"> ● Fasting blood glucose ● Signs and symptoms of hypoglycemia ● Injection site reaction ● A1c in 3 months <p>Monitoring Parameters (start GLP-1 agonist)</p> <ul style="list-style-type: none"> ● Injection site reaction ● Nausea/diarrhea ● A1c in 3 months

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters
DVT prophylaxis	2	Appropriate prophylaxis dosing of parenteral anticoagulants <ul style="list-style-type: none"> • (PICK 1) <ul style="list-style-type: none"> ○ Enoxaparin 40 mg SC daily ○ Heparin 5000 units SC TID 	Therapeutic Goals: <ul style="list-style-type: none"> • Prevent DVT and/or PE Monitoring Parameters: <ul style="list-style-type: none"> • Signs and symptoms of bleeding • Baseline hemoglobin and hematocrit daily or every other day • Platelet count Q24-72 hours
ASCVD Risk Reduction or Dyslipidemia	3	Dietary/Lifestyle modification: <ul style="list-style-type: none"> • Moderate intensity exercise for 30-40 minutes at least 3x/week Pharmacotherapy (outpatient) <ul style="list-style-type: none"> • PCSK9 inhibitor (NOTE: Preferred over statins) (PICK 1) <ul style="list-style-type: none"> ○ Alirocumab 75 mg SC Q2 weeks OR 300 mg SC Q 4 weeks ○ Evolocumab 140 mg SC Q2 weeks OR 420 mg SC Q 4 weeks OR <ul style="list-style-type: none"> • Statins (if compensated cirrhosis) (PICK 1) <ul style="list-style-type: none"> ○ Atorvastatin 40-80 mg PO daily (high intensity) ○ Rosuvastatin 20-40 mg PO daily (high intensity) ○ Atorvastatin 10-20 mg PO daily (moderate intensity) ○ Rosuvastatin 5-10 mg PO daily (moderate intensity) ○ Simvastatin 20-40 mg PO daily (moderate intensity) ○ Pravastatin 40-80 mg PO daily (moderate intensity) ○ Lovastatin 40 mg PO daily (moderate intensity) ○ Fluvastatin XL 80 mg PO daily (moderate intensity) ○ Fluvastatin 40mg PO BID (moderate intensity) ○ Pitavastatin 2-4 mg PO daily (moderate intensity) 	Therapeutic Goals: <ul style="list-style-type: none"> • LDL <100 mg/dL Monitoring Parameters <i>(if PCSK9 Inhibitor selected as recommendations for therapy)</i> : <ul style="list-style-type: none"> • Repeat lipid panel 4-12 weeks after initiating treatment • Injection site reaction • Signs and symptoms of an allergic reaction Monitoring Parameters <i>(if Statins selected as as recommendations for therapy)</i> : <ul style="list-style-type: none"> • Repeat lipid panel 4-12 weeks after initiating treatment • Muscles aches/pains (myalgia) • Cola colored urine for rhabdomyolysis
Obesity	3	Lifestyle Modifications: <ul style="list-style-type: none"> • Moderate intensity exercise most days of the week Pharmacotherapy: <ul style="list-style-type: none"> • If GLP-1 receptor agonist was chosen for diabetes → consist as above 	Therapeutic Goals: <ul style="list-style-type: none"> • 5% loss in body weight Monitoring Parameters: <ul style="list-style-type: none"> • Weight • BMI

Health Care Problem	Priority	Recommendations for Therapy	Therapeutic Goals & Monitoring Parameters
Immunizations	3	<p>Prior to Discharge:</p> <ul style="list-style-type: none"> • Covid-19 Booster #2 (PICK 1): <ul style="list-style-type: none"> ○ Moderna Bivalent 50 mcg / 0.5 mL IM x1 ○ Pfizer-BioNTech Bivalent 30 mcg / 0.3 mL IM x1 <p>Outpatient:</p> <ul style="list-style-type: none"> • Shingrix 0.5mL IM x1 → 0.5mL IM x1 2-6 months after first dose 	<p>Therapeutic Goals:</p> <ul style="list-style-type: none"> • Prevent hospitalization and death from COVID-19 • Prevent herpes zoster (shingles) <p>Monitoring Parameters:</p> <ul style="list-style-type: none"> • Signs and symptoms of allergic reaction 15 minutes after each vaccine • Injection site reaction (redness, pain, swelling)