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, and Pharmacist’s Care Plan).

IMPORTANT NOTE: Only the Pharmacist’s Care Plan will be used for evaluation purpose.
Demographic and Administrative Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Patient ID: 6439521-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex: Male</td>
<td>Hospital: NOLA Academic Medical Center</td>
</tr>
<tr>
<td>Date of Birth: 03/21/1934</td>
<td>Room &amp; Bed: Medical ICU 50</td>
</tr>
<tr>
<td>Height: 5’ 10” / Weight: 210 lbs / Race: Caucasian</td>
<td>Physician: Dr. Lopez</td>
</tr>
<tr>
<td>Prescription Coverage Insurance: Medicare Part D</td>
<td>Religion: Jehovah’s Witness</td>
</tr>
<tr>
<td>Copay: $5 (90 day generics)/$10 1st Tier/$35 2nd Tier</td>
<td>Pharmacy: CVS</td>
</tr>
<tr>
<td>Annual Income: Retired</td>
<td></td>
</tr>
</tbody>
</table>

Chief Complaint to Saint’s Community Hospital

“I am here to check-in for my hernia repair.”

History of Present Illness

Mr. Scott was transferred from Saint’s Community Hospital to NOLA Academic Medical Center intensive care unit due to acute decompensation. Mr. Scott presented to Saint’s Community Hospital on 12/2/2020 for an elective inguinal hernia repair. During Mr. Scott’s hernia repair, he became hypotensive requiring fluid administration, vasopressor therapy for 6 hours, and subsequent admission for observation. After being hemodynamically stable and having an unremarkable observation period, Mr. Scott was to be discharged on 12/5/2020. Over the past 12 hours Mr. Scott has become increasingly short of breath and has notable sputum production. Of note, Mr. Scott was admitted to Saint’s Community Hospital two months ago for a COPD exacerbation. Saint’s Community Hospital is not affiliated with NOLA Academic Medical Center, therefore details regarding his hospitalizations are limited to the transfer summary information that arrived with Mr. Scott.

General Surgery Note- Saint’s Community 12/5/2020 8:45am

24 Hour events:
New sputum production that is purulent, green, and thick in nature. Worsening respiratory status is of concern. Now requiring oxygen, which is new from baseline. Notably hypotensive as well.

Current Vitals:
HR: 105 bpm
RR: 20 breaths/min
O2 Saturation: 87% on 4L NC
BP: 80/50 mmHg
Temp: 38.2 °C

Current Medications:
3,000 mL IV bolus 0.9% sodium chloride (completed 8:30am)
Acetaminophen 500 mg PO every 4 hours PRN mild pain
Albuterol HFA 90 mcg/actuation 2 puffs every 4 hours shortness of breath, wheezing
Oxycodone 5 mg PO every 4 hours PRN moderate pain
Prednisone 10 mg PO daily

Assessment/Plan:
-Hypotensive this morning. Received fluid bolus. Appeared to have minimal to no impact on blood pressure.
-Worsening respiratory status. Titrate oxygen as needed. Sputum culture sent. No blood cultures sent at this time.
Intubation may be imminent. Will prepare patient for transfer to NOLA Academic Medical Center for higher level of care.
-Hernia repair appears to be healing well. No abdominal pain, nausea, vomiting, or diarrhea. Follow up with outpatient clinic in 2 weeks. Weight lifting restrictions should be followed for the next 7 days.
Past Medical History
COPD (mMRC 1, CAT 8 from clinic visit 10/6/2020)
Hypertension
Type 2 diabetes
Depression
Inguinal hernia

Outpatient Drug Therapy
Source: Patient provided handwritten list of medications

<table>
<thead>
<tr>
<th>CVS Pharmacy (888) 123-4567</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Hall (800) 765-4321</td>
</tr>
<tr>
<td>Albuterol HFA 2 puffs when I feel short of breath</td>
</tr>
<tr>
<td>Escitalopram 20 mg every day</td>
</tr>
<tr>
<td>Lisinopril 20 mg every day</td>
</tr>
<tr>
<td>Metformin 1,000 mg twice a day</td>
</tr>
<tr>
<td>Pantoprazole DR 40 mg every day</td>
</tr>
<tr>
<td>Prednisone 10 mg every day</td>
</tr>
<tr>
<td>One A Day Men’s 50+ Multivitamin</td>
</tr>
</tbody>
</table>

Medication History
Mr. Scott states that he has a pill organizer to manage his medications. He claims to never miss doses since starting to use the organizer. Mr. Scott does admit that he was never good at managing his diabetes. He states he “just never understood why he needed to watch his sugars.” The admitting physician verbally confirmed with Mr. Scott that he is no longer taking metformin.

Allergies/Intolerances
Sulfamethoxazole/trimethoprim- hives

Surgical History
None

Family History
Father died of colon cancer (75 years old)
Mother died of a stroke (67 years old)

Social History
Alcohol: Social drinker
Tobacco: Active smoker, smokes ½ pack per day for 40 years
Illicit drugs: None
Employment: Retired construction worker
Marital status: Married, one child

Immunization History
Received all childhood and adolescent vaccines up to age 18
Other pertinent vaccinations as noted:
Tetanus (Tdap) vaccine: 1/2018
Zostavax vaccine: 06/2000
ICU Review of Systems (12/5/2020)
Positive, for productive cough

ICU Physical Exam (12/5/2020)
General: III appearing overweight male in respiratory distress, using accessory muscles to breath
HEENT: PERRLA
Chest: Breath sounds diminished at the bases, positive rales and rhonchi bilaterally
Cardiovascular: Tachycardic, normal sinus rhythm
Abdomen: Positive bowel sounds
Genitourinary: WNL
Extremities: Cool to touch
Neuro: AO x 3
Psych: Normal

ICU Vital Signs (12/5/2020)
HR: 100 beats/min
RR: 25 breaths/min
O₂ Saturation: 80% on high flow nasal cannula
BP: 70/40 mmHg
Temp: 38.4 °C

Labs and Microbiology

<table>
<thead>
<tr>
<th></th>
<th>12/5/2020 09:00am ICU</th>
<th>12/5/2020 05:15am Saint’s Community</th>
<th>10/6/2020 Clinic Fasting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metabolic Panel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Na (mEq/L)</td>
<td>138</td>
<td>135</td>
<td>140</td>
</tr>
<tr>
<td>K (mEq/L)</td>
<td>4.3</td>
<td>4.2</td>
<td>4.1</td>
</tr>
<tr>
<td>Cl (mEq/L)</td>
<td>120</td>
<td>107</td>
<td>100</td>
</tr>
<tr>
<td>CO₂ (mEq/L)</td>
<td>28</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>BUN (mg/dL)</td>
<td>18</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td>Scr (mg/dL)</td>
<td>2.3</td>
<td>2.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Glucose (mg/dL)</td>
<td>250</td>
<td>243</td>
<td>185</td>
</tr>
<tr>
<td>Calcium (mg/dL)</td>
<td>8.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phosphorus (mg/dL)</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium (mg/dL)</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albumin (g/dL)</td>
<td>4.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AST (IU/L)</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALT (IU/L)</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total bili (mg/dL)</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CBC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WBC (million/mm³)</td>
<td>18.5</td>
<td>18.2</td>
<td>6.1</td>
</tr>
<tr>
<td>Bands (%)</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutrophils (%)</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eosinophils (%)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basophils (%)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lymphocytes (%)</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monocytes (%)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hgb (g/dL)</td>
<td>12.7</td>
<td>13.1</td>
<td>13.8</td>
</tr>
<tr>
<td>Hct (%)</td>
<td>38</td>
<td>39</td>
<td>41</td>
</tr>
<tr>
<td>Plt (K/mm³)</td>
<td>250</td>
<td>270</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td>12/5/2020 09:00am ICU</td>
<td>12/5/2020 05:15am Saint’s Community</td>
<td>10/6/2020 Clinic Fasting</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------</td>
<td>-------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Coagulation Panel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PT (sec)</td>
<td>11.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INR</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTT (sec)</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Labs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lactate (mmol/L)</td>
<td>4</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>12</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td><strong>Urinalysis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Yellow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glucose</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketone</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leukocyte esterase</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrite</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urine pH</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.026</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WBC per high-power field</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Arterial Blood Gas</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PaCO₂ (mmHg)</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCO₃⁻ (mEq/L)</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PaO₂ (mmHg)</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S_aO₂ (%)</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Microbiology</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saint’s Community Hospital Expectorated sputum culture (collected 12/5/2020)</td>
<td>Gram stain: Many squamous epithelial cells seen Many Neutrophils seen Few Gram Positive Cocci in clusters seen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood cultures x2 (collected 12/5/2020)</td>
<td>Pending</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARS-CoV-2 PCR Cellex qSARS-CoV-2 IgG/IgM Rapid Test (collected 12/5/2020)</td>
<td>PCR: Not Detected IgG: Negative IgM: Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRSA Nasal PCR (collected 12/5/2020)</td>
<td>Pending</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viral PCR Panel (collected 12/5/2020)</td>
<td>Pending</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Other Diagnostic Tests
Chest X-ray Impression (12/5/2020):
  1. Pulmonary vascular congestion with small effusions
  2. Left lower lobe consolidation, consistent with pneumonia

Prior To Admission Hospital Medication List
Source: Prior to admission medication list found in the NOLA Academic Medical Center medical record

<table>
<thead>
<tr>
<th>Drug Name/Strength/Route</th>
<th>Prescribed Schedule and Administration</th>
<th>Date Last Reconciled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuterol HFA 90 mcg/actuation inhaled</td>
<td>2 puffs every 4 hours PRN shortness of breath, wheezing</td>
<td>4/7/2019</td>
</tr>
<tr>
<td>Bupropion XL 150 mg PO</td>
<td>150 mg daily</td>
<td>4/7/2019</td>
</tr>
<tr>
<td>Escitalopram 20 mg PO</td>
<td>20 mg daily</td>
<td>4/7/2019</td>
</tr>
<tr>
<td>Famotidine 20 mg PO</td>
<td>20 mg daily</td>
<td>4/7/2019</td>
</tr>
<tr>
<td>Lisinopril 20 mg PO</td>
<td>20 mg daily</td>
<td>4/7/2019</td>
</tr>
<tr>
<td>Metformin 1,000 mg PO</td>
<td>1,000 mg twice daily</td>
<td>4/7/2019</td>
</tr>
<tr>
<td>Pantoprazole DR 40 mg PO</td>
<td>40 mg daily</td>
<td>4/7/2019</td>
</tr>
<tr>
<td>Prednisone 10 mg PO</td>
<td>10 mg daily</td>
<td>4/7/2019</td>
</tr>
<tr>
<td>Sitagliptin 100 mg PO</td>
<td>100 mg daily</td>
<td>4/7/2019</td>
</tr>
</tbody>
</table>
Current ICU Drug Therapy Orders

Medication Reconciliation: ☐ Completed  ☒ Not completed

<table>
<thead>
<tr>
<th>Drug Name/Strength/Route</th>
<th>Prescribed Schedule and Administration</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuterol HFA 90 mcg/actuation inhaled</td>
<td>2 puffs every 4 hours PRN shortness of breath, wheezing</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Bupropion XL 150 mg PO</td>
<td>150 mg daily (0900)</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Dextrose 50% IV</td>
<td>25 gm PRN every 30 minutes hypoglycemia</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Enalapril 5 mg PO</td>
<td>5 mg once daily (0900)</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Interchanged to formulary alternative per P&amp;T authority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escitalopram 20 mg PO</td>
<td>20 mg daily (0900)</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Famotidine 20 mg PO</td>
<td>20 mg daily (0900)</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Insulin lispro (human) 100 unit/mL injection SLIDING SCALE (0-5 units) Subcutaneously</td>
<td>Scheduled, every 4 hours (0000, 0400, 0800, 1200, 1600, 2000) For blood glucose &lt; 151 mg/dL give no additional units; For blood glucose 151-200 mg/dL give 1 unit; For blood glucose 201-250 mg/dL give 2 units; For blood glucose 251-300 mg/dL give 3 units; For blood glucose 301-350 mg/dL give 4 units; For blood glucose 351-400 mg/dL give 5 units.</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Metformin 1,000 mg PO</td>
<td>1,000 mg twice daily (0900; 2000)</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Pantoprazole DR 40 mg PO</td>
<td>40 mg once daily (0900)</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Prednisone 10 mg PO</td>
<td>10 mg once daily (0900)</td>
<td>12/5/2020</td>
</tr>
<tr>
<td>Sitagliptin 100 mg PO</td>
<td>100 mg daily (0900)</td>
<td>12/5/2020</td>
</tr>
</tbody>
</table>

Pocket Card Version of Hospital’s Antibiogram*

<table>
<thead>
<tr>
<th></th>
<th>Ampicillin</th>
<th>Piperacillin/ Tazobactam</th>
<th>Cefazolin</th>
<th>Ceftriaxone</th>
<th>Cefepime</th>
<th>Aztreonam</th>
<th>Meropenem</th>
<th>Vancomycin</th>
<th>Daptomycin</th>
<th>Clofiroxacin</th>
<th>Gentamicin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus - MSSA</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>92</td>
<td>99</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staphylococcus aureus - MRSA1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>41</td>
<td>98</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Streptococcus pneumoniae</td>
<td>93</td>
<td>97</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae</td>
<td>77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>54</td>
<td>96</td>
<td>80</td>
<td>91</td>
<td>92</td>
<td>90</td>
<td>100</td>
<td>82</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>0</td>
<td>81</td>
<td>92</td>
<td>94</td>
<td>95</td>
<td>94</td>
<td>100</td>
<td>95</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>83</td>
<td>85</td>
<td>67</td>
<td>89</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Antibiogram does not represent all antibiotic choices
120% of staphylococcus aureus isolates are methicillin resistant
Assessment & Plan
Mr. Scott is admitted directly to the medical ICU. His clinical status continues to worsen despite an IV fluid bolus and being placed on high flow nasal cannula prior to arrival. The team is preparing to intubate the patient and place an orogastric tube post intubation. Of note, Mr. Scott has limited line access consisting of two peripheral lines. Mr. Scott has pending orders to place a central line and an arterial line.

While Mr. Scott is undergoing rapid sequence intubation, using hospitalized protocols for medication selection and dosing, the intern asks you to review Mr. Scott’s case and make recommendations regarding his ongoing acute hospital problems, as well as any additional areas of optimization you may find regarding his past medical history.
### 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.

<table>
<thead>
<tr>
<th>Health Care Problem</th>
<th>Priority</th>
<th>Recommendations for Therapy</th>
<th>Therapeutic Goals &amp; Monitoring Parameters</th>
</tr>
</thead>
</table>
| Septic shock secondary to hospital acquired pneumonia | 1 | - Antibiotics  
  o Initiate broad spectrum antibiotics directed towards likely respiratory source, ideally within the first hour  
  **MRSA Coverage**  
  o Vancomycin  
   ▪ Loading dose: 20-25 mg/kg IV once using actual body weight  
   ▪ Appropriate doses: 2,000 mg; 2,250 mg; 2,500 mg  
   ▪ Administer dose no faster than 1,000 mg/hour to prevent red man syndrome  
   ▪ Recommend intermittent dosing due to acute kidney injury  
  o Linezolid should be avoided due to concomitant SSRI  
  **Pseudomonas Coverage**  
  *Award bonus points to teams that select extended interval dosing strategies*  
  1. Select one of the following anti-pseudomonal β-lactam based agents  
   o Piperacillin-tazobactam  
   ▪ 3.375 gm IV every 8 hours, extended interval dosing (over 4 hours)  
     ▪ Loading dose of 3.375 gm or 4.5 gm IV once over 30 minutes may be administered  
   ▪ 4.5 gm IV every 8 hours (over 30 minutes)  
   ▪ 3.375 gm IV every 6 hours (over 30 minutes) |  | Therapeutic Goals  
  - Goal vancomycin trough 15-20 mcg/mL  
  - Goal MAP ≥ 65mmHg  
  - Lactate clearance <2 mmol/L within 24 hours  
  - Resolution of infection  
  Monitoring Parameters  
  - Check vancomycin serum concentration in 24 hours to evaluate pharmacokinetic parameters and need for re-dosing  
  - Fever defervescence  
  - Daily WBC monitoring for down trend  
  - Daily serum creatinine and BUN evaluation for resolving AKI to schedule vancomycin regimen and adjust antibiotic dosing  
  - Cultures, MRSA PCR, and viral PCR results to de-escalate antibiotics  
  - Improvement in blood pressure to titrate down vasopressor therapy  
  - Serum chloride to avoid further acid-base disturbances, as well as potential...
<table>
<thead>
<tr>
<th><strong>Cefepime</strong></th>
<th><strong>Meropenem</strong></th>
<th><strong>Imipenem-Cilastatin</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 gm IV every 12 hours, extended interval dosing (over 3-4 hours)</td>
<td>2 gm IV every 12 hours, extended interval (over 3 hours)</td>
<td>200 mg IV every 6 hours (over 20-30 minutes)</td>
</tr>
<tr>
<td>1 gm IV every 12 hours (over 30 minutes)</td>
<td>2 gm IV every 12 hours (over 15-30 minutes) if using adjusted body weight for CrCl</td>
<td>200 mg IV every 6 hours (over 20-30 minutes)</td>
</tr>
<tr>
<td><strong>Aztreonam</strong> is not ideal based on antibiogram</td>
<td><strong>Ceftazidime</strong></td>
<td>2 gm IV every 24 hours (over 15-30 minutes)</td>
</tr>
</tbody>
</table>

2. **PLUS** Select one of the following non-β-lactam anti-pseudomonal agents

- **Levofloxacin** 750 mg IV every 48 hours
- **Ciprofloxacin** 400 mg IV every 24 hours
- **Aminoglycoside** (Gentamicin, Tobramycin, Amikacin)
  - Not ideal, currently in AKI
- **Polymixins** (Colistin or Polymixin)
  - Not ideal, no evidence of high MDR prevalence

- **Fluids**
  - Adequate bolus in ED was already provided
  - Recommend assessment of fluid responsiveness to determine if maintenance fluids should be added

- **Vasopressors**
  - Initiate Norepinephrine titrated to a goal MAP of ≥65mmHg
    - Range: 0.1-3.3 mcg/kg/min or 5-200 mcg/min
  - Discontinue enalapril 5 mg PO daily in the setting of acute hypotension (also addressed in additional problems below)

- **Steroids**
  - Discontinue prednisone 10 mg PO daily
  -Initiate hydrocortisone
    - 50 mg IV every 6 hours
    - 100 mg IV every 8 hours
| Acute kidney injury | 2 | - Fluid management, as described in the sepsis plan  
- Discontinue enalapril 5 mg PO daily in setting of AKI and hypotension  
- Renally dose medications, as described in other problems | Therapeutic Goals | - Improve serum creatinine back to baseline  
- Urine output 0.5-1 mL/kg/hr |
| Diabetes | 2 | **Current Plan:**  
**Oral Antidiabetic Agents**  
- Hold metformin  
  - Appears to be no longer taking per patient provided medication list  
- Discontinue sitagliptin 100 mg PO daily, patient is no longer taking  
**Insulin Therapy Options**  
*Teams should select one of the following options:*  
- Continue sliding scale insulin regimen  
- Discontinue sliding scale insulin regimen and initiate an insulin infusion  
  - Insulin Regular 1-16 units/hour titrated to maintain blood glucose between 140-180 mg/dL | Therapeutic Goals | **Current Plan:**  
- Blood glucose <180 mg/dL in the ICU setting  
- Avoidance of hypoglycemia  
**Long Term Plan:**  
- A1C <7.5%  
- Fasting/pre-prandial blood glucose: 90-130 mg/dL  
- Peak post-prandial blood glucose: <180 mg/dL  
- Bedtime glucose: 90-150 mg/dL  
- Blood pressure: <140/90 mmHg |
| | | **Current Plan:**  
- Blood glucose every 4 hours if on SSI or every 1 hour if on an insulin infusion  
- Signs and symptoms of hypoglycemia: shakiness, irritability, confusion, tachycardia, hunger | Monitoring Parameters |  
- Daily serum creatinine and BUN evaluation for resolving AKI to schedule vancomycin regimen and adjust antibiotic dosing  
- Urine output as a sign of AKI improvement |

© 2019, American Society of Health-System Pharmacists®, Inc. All rights reserved.
| **Sedation/Analgesia** | 2 | - Initiate analgosedation strategy after successful intubation  
  o Fentanyl 25-200 mcg/hr infusion plus fentanyl boluses 25-100 mcg PRN every 15 minutes OR  
  o Hydromorphone 0.5-2 mg/hr infusion plus hydromorphone boluses 0.5-1 mg PRN every 15 minutes  
**BONUS:** Add bowel regimen in setting of continuous opiate therapy | - Hyperglycemia and need for adjustment to sliding scale regimen or alteration in insulin therapy approach  
Long Term Plan:  
- Blood glucose: AM fasting, pre-prandial, 1-2 hours post-prandial, bedtime  
- A1C in 3 months  
- Gastrointestinal disturbances with metformin use  
- Lifestyle modifications  
- Signs/symptoms of hypo and hyperglycemia  
- Adherence to regimen, as this appears to have been an issue in the past  
**Therapeutic Goals**  
- RASS +1 to -1  
- CPOT ≤ 2 or BPS ≤ 3  
- Perform daily sedation interruption  
**Monitoring Parameters**  
- Pain and sedation scoring for addition of other sedative agents or optimization of dosing strategy  
- Consider need for multimodal pain strategies (ex. Acetaminophen)  
- Constipation in the setting of continuous opiate exposure  
- Delirium via the CAM-ICU assessment |
| **DVT prophylaxis** | 2 | - Initiate heparin 5,000 units SQ every 8 hours  
  o Less preferred option: heparin 5,000 units SQ every 12 hours  
  o Less preferred option: enoxaparin 30 mg SQ daily | - Prevent DVT formation  
- If enoxaparin selected: Anti-Xa 0.2-0.5 units/mL  
**Monitoring Parameters**  
- Hemoglobin, hematocrit, platelets, HIT |
| Stress ulcer prophylaxis/GERD | 2 | Current Plan:  
- Continue pantoprazole 40 mg daily, but convert to oral granules or IV  
- Discontinue famotidine 20 mg PO daily, as this was inappropriately continued on admission  

Long Term Plan:  
- Interview patient to discuss GERD symptoms as patient is on home pantoprazole without indication  
- Discuss lifestyle modifications to prevent/reduce GERD  
- Consider continuation of pantoprazole 40 mg PO daily if patient reports GERD symptoms and prior failure on famotidine  

**BONUS:** Initiate chlorhexidine 0.12% 15mL PO twice daily for VAP prevention |
| --- | --- | --- |
| Depression | 2 | Current Plan:  
- Continue escitalopram 20 mg PO daily  
- Discontinue bupropion XL 150 mg PO daily, as this was inappropriately continued on admission  

Long Term Plan:  
- Continue escitalopram 20 mg PO daily |

**Therapeutic Goals**  
Current Plan:  
- Prevent stress ulcer formation  

Long Term Plan:  
- Prevent GERD symptoms  

**Monitoring Parameters**  
Current Plan:  
- *C. difficile* risk with antibiotics and long term PPI exposure  

Long Term Plan:  
- Lifestyle modifications  
- Signs and symptoms of GERD  

**Therapeutic Goals**  
Current Plan:  
- Minimize agitation and delirium related to holding/discontinuing neuropsychiatric medications  

Long Term Plan:  
- Minimize signs/symptoms of depression  

**Monitoring Parameters**  
Current Plan:  
- RASS scoring, as discussed in the sedation plan, to ensure patient is not too somnolent or too agitated  
- CAM-ICU scoring for delirium  
- Serotonin syndrome if other serotonergic medications are added |
| **Inguinal Hernia Repair**  
**Bonus recommendations, goals, and parameters not graded** | **2** | • Initiation of a PRN pain management regimen with a preference towards a non-opioid analgesic strategy after completion of continuous IV narcotic for sedation  
  o Acetaminophen would be the preferred agent  
  o Avoid NSAIDs given AKI |
|---|---|---|
| **Smoke Cessation** | **3** | • Assess 5 A’s  
  o Ask - Identify and document tobacco use status.  
  o Advise - In a clear, strong, and personalized manner, urge every tobacco user to quit.  
  o Assess - Is the tobacco user willing to make a quit attempt at this time?  
  o Assist - For the patient willing to make a quit attempt, use counseling and pharmacotherapy to help him quit.  
  o Arrange - Schedule follow-up contact, in person or by telephone, preferably within the first week after the quit date.  
• If willing to quit initiate **one** of the following pharmacologic therapies:  
  o Nicotine patch 14 mg transdermally daily  
  o Nicotine lozenge 2-4 mg depending on when patient smokes their 1st cigarette of the day, one lozenge every 1-2 hours (Max 20 per day)  
  o Nicotine gum 4mg, chew 1 gum every 1 hour (Max 24 per day)  
  o Nicotine inhaler, 1 inhalation as needed every 1-2 hours (Max 16 per day)  
  o Nicotine nasal spray, 1 spray per nostril every 1-2 hours (Max 80 sprays per day)  
  o Bupropion would not be recommended due to current escitalopram use  
  o Varenicline would not be recommended due to depression history  
• Consider behavioral intervention to encourage smoking cessation  
  o Cognitive behavior therapy  
  o Motivational interviewing |

---

**Long Term Plan:**  
• Signs and symptoms of depression

**Therapeutic Goals**  
• Adequate pain control using a visual analog scale

**Monitoring Parameters**  
• Signs and symptoms of infection: redness, swelling, tender to touch, fever, chills, drainage from surgical site

**Therapeutic Goals**  
• Minimize tobacco withdrawal symptoms, with the ultimate goal of abstinence from smoking if patient is willing

**Monitoring Parameters**  
• Abstinence from smoking  
• Barriers to quitting  
• Signs and symptoms of withdrawal: cravings, difficulty sleeping, mood changes, restlessness, increased hunger, constipation
### COPD

- Continue PRN albuterol inhaler
- Initiate a LAMA for Group C COPD
  - Best choice:
    - Tiotropium MDI 5 mcg (2 inhalations) daily
  - Appropriate choice, but not cost effective:
    - Revefenacin nebulizer 175 mcg (1 vial) inhaled daily
    - Glycopyrrolate nebulizer 25 mcg (1 vial) inhaled twice daily
  - Likely inappropriate therapy choices because of dry powder inhaler formulation and poor inspiratory effort
    - Aclidinium DPI 400 mcg (1 inhalation) twice daily
    - Glycopyrrolate DPI 15.6 mcg (1 capsule inhaled) twice daily
    - Tiotropium DPI 18 mcg (1 capsule inhaled) daily
    - Umeclidinium DPI 62.5 mcg (1 inhalation) daily
- Taper off and discontinue chronic steroid therapy
  - Steroids should not be tapered prior to vasopressor cessation

#### Therapeutic Goals
- Improve functional status and quality of life
- Optimize lung function
- Improve symptom management
- Prevent exacerbations

#### Monitoring Parameters
- Signs of dyspnea
- Number of exacerbations
- Inhaler technique and adherence
- Respiratory effort if dry powder inhaler was selected

### Hypertension

- All home antihypertensive medications should be held in the setting of acute hypotension and AKI
- Once hypotension is resolved and renal function improved, resume ACE-inhibitor
  - Enalapril incorrect conversion from home Lisinopril, dosing should be 10 mg PO daily
  - Initiate Enalapril 10 mg PO daily if still admitted (based on formulary per inpatient medical record) or lisinopril 20 mg PO daily (if discharged)
- Counsel patient on home blood pressure monitoring

#### Therapeutic Goals
- Blood pressure: <140/90 mmHg

#### Monitoring Parameters
- Serum creatinine
- Serum potassium
- Signs and symptoms of hypotension
- Signs and symptoms of hypertension

### Immunizations

- Administer high dose influenza vaccine as patient is over 65
- Administer Shingrix now and second dose in 2-6 months
- Administer pneumococcal vaccine PPSV23

#### Therapeutic Goals
- Prevent potential disease burden and optimize public health through immunizations specific to patient’s respiratory comorbidities

#### Monitoring Parameters
- 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 to monitor for signs of anaphylaxis (throat swelling, difficulty breathing)