Faculty Report on College-wide Academic Student Learning Outcomes (CASLO) Evidence

Program: Nursing
Course: NURS230

CASLO Focus:
- Critical Thinking
- Written Communication
- Oral Communication
- Creativity
- Information Literacy
- Quantitative Reasoning

Student sample has been rated:
- Exemplary level
- Minimal level

Your course has been selected for this activity because it requires exit-level skills for the indicated CASLO focus and program. Please consider the following guidelines as you select appropriate evidence of student learning for this activity:

- Select two samples of student work, one that demonstrates exemplary achievement of the CASLO and another that demonstrates achievement at (or near) the minimal level required for students passing with at least a “C.” Choose evidence from an “embedded” assignment, project, or exam that normally exists as part of your course.

- Review the statements associated with the relevant CASLO standard (see attached) to assure that the evidence correlates adequately with the CASLO. In general, choose evidence which corresponds to at least fifty percent of the outcome statements.

- Select evidence produced with an appropriate degree of independence. In general, student work guided by significant external direction is not appropriate for this activity.

Please briefly describe your assessment of the evidence; identify qualities in the student work that establish its level of achievement for the CASLO:

In NURS230 students select a patient that they have cared for in the hospital during their practicum and write a paper demonstrating their understanding of the holistic care of the patient. Their goal is to synthesize a large amount of data and demonstrate an understanding of how the many physiologic concepts interact in a specific patient to guide individualized care. They are expected to collect, organize, and analyze the data, utilizing the paper to convey their understanding of how all the data interconnects.

In this sample, the student demonstrates an understanding of the patient's situation and an ability to convey this to the reader in writing. The main idea is developed with logic and coherence to convey a clear portrayal of the patient care experience. The introductory paragraphs provide an overview of the patient course of hospitalization and history, setting the stage to later reveal the details of care and patient responses. The information is presented in an objective, third-person style utilizing medical terminology, and key points are consistently linked back to the individual patient. Headers are used to designate subsections and all categories specified in the instructions are included. Redundancy is avoided yet there is enough repetition of key data points to connect the inter-related subsections. Reference materials are consistently integrated utilizing APA style to provide depth of knowledge on the pathophysiology, pharmacology, and laboratory analysis of the patient's data.

Continue on next page.
Please briefly describe course work designed to prepare this student to demonstrate this CASLO:

This course (NURS230) is the last in the first year of the nursing program; prerequisites to the program and to this class begin to prepare students for this assignment:
* ENG100 (Composition 1)
* Writing-intensive NURS210 course
* Concept map assignment in NURS220 (creating a concept map for a patient showing interconnections between concepts and care plans)
* Library orientations in NURS210 & NURS220 (with focus on finding and utilizing nursing research)
* NURS211 (Professionalism in Nursing) with focus on use of APA format for scholarly writing
* In this course: weekly written nursing care plans, medication lists, lab analysis, and focused preparation questions for patients in practicum with written feedback from clinical instructors
Extensive History and Assessment

Precipitating events

The focus of this concept-based project is an 82 year old Japanese female, who will be referred to as I.S. She was brought to the Emergency Department (ED) by EMS services after her caretaker could not arouse her to give morning medications. The Maui Fire Department was first on the scene and found her lying supine in bed, moaned in response to painful stimuli, and her caregiver reported she had a cough for the past day. Initial assessment revealed audible bilateral rhonchi in her lungs and chronic contractures. I.S. was transported via ambulance to Maui Memorial Medical Center on 11/09/12. Upon arrival at the ER, I.S. was treated with IV fluids, and a nebulizer treatment. Initial studies revealed hyponatremia, leukocytosis, and a UTI followed by a later diagnosis of pneumonia. I.S. was admitted to the medical surgical floor, Maui South, for monitoring and treatment.

Medical Surgical History

I.S. has an extensive list of long standing chronic conditions. She has a history of hypertension (HTN), and diabetes mellitus (DM) that have been poorly managed as evidenced by related complications. Uncontrolled hypertension and diabetes has lead to diabetic retinopathy with associated glaucoma, chronic renal insufficiency, and coronary artery disease (CAD). To treat her hypertension I.S. takes an ACE inhibitor, arterial vasodilator, and diuretic twice daily. She also takes several ocular antihypertensives to prevent further retinopathy and manage glaucoma. To control diabetes she receives regular subcutaneous injections of regular and long acting insulin. She also wears a nitroglycerin patch during the day to prevent chest pain associated with CAD.
In 2003 I.S. suffered a lacunar infarction, or CVA, that resulted in bilateral weakness of all four extremities, dysphagia, and dementia. Following the stroke, I.S. was left bedridden and unable to perform ADL’s without assistance. Until recent admission to MMMC she had been staying in a care home in Kahului.

On 5/4/12 I.S. suffered a fall that resulted in a right proximal humerus fracture that required surgical repair with a shoulder prosthesis. At this time she was diagnosed with osteopenia based on X-rays performed. Since then, her osteopenia has advanced to osteoporosis and she was placed on calcium supplement to prevent further bone demineralization. Prior to this incident her only previous surgery was an appendectomy.

Preceding this event I.S. was brought to the ED 10/12/12 for cellulitis of her lower extremities which is now resolved. Laboratory studies also revealed a low red blood cell count microalbuminuria. She was placed on a daily iron supplement and antibiotic and returned to her care home.

Social History

I.S. is a poor historian as a result of her underlying dementia. Her social history states she is widow, of Japanese descent, and has lived on Maui her entire life. There is no evidence of a smoking history or use of alcohol. Her power of attorney listed in her advanced directive is her niece Colleen who resides on Maui. She was contacted regarding her aunt’s admission and reported that the patient was “bedridden, incontinent, unable to hold a cup or spoon, and is no code status”. She has had no visitors since hospitalization and her caregiver indicated that she will no longer provide care for patient because she “does not want her to die in her home.”
Course of Hospitalization

I.S. presented to the ER with a temperature of 96.8, blood pressure of 104/75, pulse of 93, and respiratory rate of 18. Laboratory studies performed revealed an elevated white blood cell count (36,400 K/mcl) indicating infection, a low sodium level (Na+ 121 mEq/L), and a high potassium level (K+ 5.6 mEq/L). Urinalysis also showed yellow, cloudy urine with < 100 white blood cells and bacteria signifying a urinary tract infection (UTI). A chest X-Ray performed showed increased bilateral infiltrates of the lungs evidencing bilateral pneumonia.

Initial treatment included admission to medical surgical floor, Maui South, for further monitoring and treatment. IV fluids of normal saline at 75ml/hr were initiated to treat dehydration along with supplemental oxygen. The patient also received IV antibiotics Rocephin and Zithromax for UTI and pneumonia and prescribed Solumedrol to decrease lung inflammation. The patient was removed from her ACE inhibitor and diuretic, Furosemide, to rule out cause of hyponatremia and hyperkalemia being related to chronic renal insufficiency versus abnormality related to dehydration, diabetes and ACE inhibitor use. Also ordered were urine and sodium osmoality levels, urine and blood cultures, labs for folate, B12, cortisol, and TSH levels and prn nebulizer treatments.

On 11/10/12 urine culture revealed Citrobacter koseri and Escherichia coli. Morning labs showed a serum glucose level of 220mg/dl, and red blood cell count (RBC) of 3.82, and hemoglobin (Hgb) of 10.9g/dl. She received two units of blood for a total of 700ml for treatment of anemia and low Hgb levels. A standing order was also written to transfuse patient additionally for Hgb levels < 8g/dl. A chest x-ray was performed and when compared to previous x-ray showed partial clearing of patchy bilateral air space.
opacities. The patient was discontinued from the Rocephin therapy based on these results.

During the course of hospitalization the patient presented with repeated high glucose levels despite not eating and uncontrolled hypertension. She was discontinued from Solumedrol that was believed to be the root of the hyperglycemia. Accucheks were ordered twice daily with regular acting insulin injections based on a sliding scale to keep tighter control of glucose management. The patient was resumed on her ACE inhibitor and a beta blocker, Metoprolol, was added to her medication regiment on 11/11/12.

I.S. has a poor level of cognition as a result of her stroke and underlying Dementia. Throughout her stay in the hospital she has been oriented only to self and cannot effectively communicate with staff. Because of her altered mental status, retinopathy, and residual dysphagia she is at an increased risk for falls and aspiration. She requires someone to feed her and must be closely monitored for aspiration and sometimes requires oral suction. She is able to take medications by mouth, unless crushed and administered with apple sauce. She is on a diabetic cardiac care diet, chopped with nectar thick liquids. I.S. has a poor appetite. Since admission she has only consumed < 10% of her meals. As a result on 11/16/12 her 0700 Accuchek was 33. She was given thickened applesauce with sugar added and her insulin was withheld. After evaluation my Dr. Stuart, scheduled insulin was changed to once daily and her Prednisone dose was decreased.

I.S. requires total assistance with all ADL’s. She is incontinent of bowel and bladder, and has not had a bowel movement (BM) since 11/11/12. She was given a Dulcolax suppository on 11/14/12 with no results, and received first dose of Colace on
11/16/12. On 11/12/12 labs showed a WBC of 7.4 K/mcl indicating resolution of infection. Lung sounds had improved and the patient no longer needed nebulizer treatments from respiratory therapy or supplemental oxygen. On 11/15/12 she was cleared for discharge to Hale Makua, but was unable to be admitted because of problems associated with Medicare. She was scheduled for discharge to Hale Makua for permanent placement on 11/16/12 at 2pm.

Pathophysiology

In order to understand I.S.’s admitting medical diagnosis of dehydration, pneumonia, UTI and hyponatremia her medical history of longstanding chronic illnesses and associated complications must be examined.

Type II Diabetes Mellitus

“Individuals with type 2 diabetes have high blood glucose levels resulting from insulin resistance and relative insulin deficiency” (Copstead & Banasik, 2010, p. 949). Insulin is the principal hormone that regulates uptake of glucose from the blood into most cells. Over time, the beta cells in the pancreas fail to produce sufficient insulin resulting in failure in movement of glucose across the cell membrane ensuing hyperglycemia. Type 2 Diabetes represents 90-95% of cases of diabetes, and is usually a condition of middle-aged and older individuals (Gulanik & Myers, 2011). Obesity and a genetic predisposition are a major factor in the development of the disease.

Type 2 diabetes mellitus is first managed by increasing exercise and dietary modification. If diet and exercise are not successful in lowering blood glucose levels, then insulin or medication may be required. People on insulin, are usually required to
routinely check blood sugar levels (Copstead & Banasik, 2010). Management over glucose levels is crucial to prevent further problems. “Complications related to poorly managed diabetes cause vascular and neuropathic dysfunction. Vascular complications include coronary artery disease, stroke, and peripheral vascular disease. Retinopathy and nephropathy are due to induced thickening of retinal and glomeruli basement membranes.” (Copstead & Banasik, 2010, p.953). Although I.S. receives regular injections of insulin, she has a history of unmanaged blood glucose.

**Hypertension**

“...is a chronic medical condition in which the blood pressure in the arteries is elevated. This requires the heart to work harder than normal to circulate blood through the blood vessels” (Venes, 2009, p. 1123). Elevated blood glucose levels, diabetes mellitus, and elevated total cholesterol are implicated as risk factors for hypertension. Proper management and treatment of hypertension is necessary because of the harm it may cause in body tissues and organs. Hypertension is one of the major risk factors for Coronary Artery Disease (CAD), stroke (CVA), peripheral vascular disease, kidney failure, and retinopathy (Copstead & Banasik, 2010). Chronic hypertension and poor glucose management has accelerated I.S.’s development of related complications.

**Diabetic Retinopathy**

“refers to the process of microvascular damage to the retina as a result of chronic hyperglycemia and hypertension in patients with diabetes” (Lewis, Dirksen, Bucher, & Camera, 2011, p.1248). Microvascular complications cause thickening of the vessel membranes and capillaries in response to hyperglycemia. Blood vessel abnormalities lead to the formation of small micro-aneurysms that appear in the small blood vessels of
the retina causing capillary blockage and infarction of the nerve fibers covering the retina (Lewis, et. al. 2011.) When retinal capillaries are occluded the body compensates with neovascularization, formation of new blood vessels. However, these vessels are abnormal, fragile, and predisposed to leak causing sever vision loss. It is estimated to be the most common cause of blindness in adults with diabetes mellitus and hypertension (Lewis, 2011). People with diabetes are also prone to other visual problems.

**Glaucoma**

“occurs as a result of the occlusion of aqueous humor outflow channels secondary to neovascularization” (Lewis, et al. 2011, p.1249).

Glaucoma is a condition characterized by increased ocular pressure (IOP). As fluid pressure inside the eye and against the retina increases, blood flow through the retina slows. Reduced blood flow causes deterioration of retina and loss of vision. *Glaucoma is more common in the elderly, individuals with diabetes, and is also associated with systemic hypertension* (Copstead & Banasik, 2010). I.S. has serious visual impairment as a result of her hypertension and diabetes. The combination of two disease processes effect on the eye has resulted in her loss of vision.

**Stage II Renal Disease**

*“Diabetic nephropathy is characterized by glomerulosclerosis, or thickening and hardening of the basement membrane of capillaries in the glomeruli”* (Copstead & Banasik, 953). The glomerulus is responsible for filtration of urine. In the first stage of diabetic retinopathy, an increase in glomeruli flow rate occurs causing hyperfiltration and subsequent damage to the glomeruli. The resulting glomerulosclerosis leads to blockage and leaking of the capillaries. *This is characterized by protein in the urine or,*
microalbuminuria (Lewis, et. al. 2011.) As the disease advances, the filtration rate decreases and the person experiences renal failure. In addition to renal disease, nephropathy is also a complication of hypertension. With prolonged hypertension the regulatory ability of the glomeruli to control flow rate is lost resulting in damage to the glomeruli (Copstead & Banasik, 2010).

I.S. was recently diagnosed with microalbuinuria, and admitting UA also showed evidence of protein in her urine signifying renal disease as a result of her HTN and DM.

**Coronary Artery Disease**

“...narrowing of the coronary arteries, usually as result of atherosclerosis” (Venes, 2010, p. 528). The increased tension high blood pressure generates on walls of arteries causes hardening and narrowing of the walls in blood vessels. When the vessels include the vessels that supply the heart muscle with blood CAD is present. “CAD limits the supply of oxygen to the heart and the combination of increased demand and decreased supply predisposes the heart to ischemia. Ischemia results in angina or chest pain” (Copstead & Banasik, 2010, p.385).

**Stroke, CVA, Lacunar Infarct**

A stroke occurs when there is inadequate blood flow to a part of the brain that results in the death of brain cells. I.S. specifically experienced a Lacunar Infarction caused from an “occlusion of a small penetrating artery with the development of a cavity in the place of the dead brain tissue” (Lewis, et. al., 2011, p.1463). The occlusion is caused from injury to a vessel wall and the formation of a clot in the damaged artery. Aging, hypertension, diabetes mellitus, hyperlipidemia, and smoking are the most
significant risk factors for the development of lacunar infarcts (Copstead & Banasik, 2010).

As a result of I.S.’s stroke, she suffers from motor loss, dysphagia, and dementia. *Motor impairment from a stroke is characterized by flaccidity, which is a decrease or absence of muscle tone and is in response to a loss of neuromuscular control (Venes, 2009).* I.S. has residual impairment of all four extremities, and has been bed bound since her stroke. *The inability to control muscles in her limbs has caused contractures, or tightening and shortening of the muscle severely limiting her mobility (Venes, 2009).*

Dysphagia is the medical term for difficulty swallowing (Lewis, et. al., 2011). Swallowing requires coordination of the nerves and muscles of the tongue, mouth, and throat. *The brain damage that occurs as a result of a stroke causes muscle weakness and difficulty swallowing (Lewis, et. al., 2011).* Aspiration is inhaling food or saliva into the lungs, and can result in pneumonia. I.S.’s dysphagia is so severe that she consumes a pureed diet and has thickened liquids to prevent her from choking and aspirating. She is at high risk to develop aspiration pneumonia related to her dysphagia and altered level of consciousness (LOC).

*Dementia is a generalized impairment of intellectual functioning that interferes with social and occupational functioning (Potter & Perry, 2009).* I.S. suffers specifically from vascular dementia as a result of ischemia to the brain (Lewis, et. al., 2011, p.1518). *Conditions such as hypertension, hyperlipidemia, diabetes mellitus, coronary artery disease, and stroke are common related factors (Lewis, et. al., 2011).* Since I.S suffered her stroke in 2005 there has been a significant deterioration of cognitive function that has caused the inability to perform basic activities of daily living. I.S. lives in a care home
where she receives twenty four hour care. She recently developed several acute conditions that required hospitalization for treatment, that are result of her chronic illness contributing to a poor state of health.

**Pneumonia**

“Pneumonia refers to an inflammatory reaction in the alveoli and interstitium of the lungs, usually caused by an infectious agent.” Pneumonia can result from three different sources: (1) aspiration of oropharyngeal secretions composed of normal bacteria and flora/ or gastric contents; (2) inhalation of contaminants; or (3) contamination from systemic circulation” (Copstead & Banasik, 2010, p.582). “Conditions that increase risk of aspiration pneumonia include decreased level of consciousness and difficulty swallowing” (Lewis, et al., 2011, p.548). Furthermore, patients with chronic illnesses, age 65 and older, immobile, or immuosuppressed are also at high risk for developing pneumonia. (Lewis, et al, 2011).

Pneumonia may have been result of aspirating oropharyngeal secretions. Alternatively, I.S. is immobile and at increased risk for hydrostatic pneumonia: Inflammation of the lung from the stasis or pooling of secretions. Stasis of secretions is a perfect growing medium for bacteria that could later cause infection (Potter & Perry, 2009). Diabetes Mellitus further complicates pneumonia because it decreases immune cell function and increases inflammation.

**Urinary Tract Infection**

“Infection of the kidneys, ureters, or bladder by microorganisms that either ascend from the urethra (95% of cases) or that spread to the kidney from the blood stream” (Venes, 2009, p. 2413). *E. coli* causes 80% of all UTI’s, and women are more
susceptible because of the proximity of the urethra to the perineum. Debilitated persons, older adults, patients who are immune compromised due to comorbid diseases (e.g. diabetes mellitus), and patients treated with corticosteroids are at high risk for UTI (Lewis, et al., 2011). Because I.S. is bedridden and incontinent of bowel and bladder normal flora from the bowel or perineum can enter the urethral meatus if briefs aren’t promptly changed. Moreover, improper wiping from her caregiver (from back to front) could also introduce bacteria to the urethra. In order to flush bacteria out of the urethra adequate hydration must be maintained to produce urine. I.S. was admitted with dehydration and suffers from renal insufficiency which may alter flow of urine.

**Dehydration**

Dehydration occurs when the amount of water leaving the body is greater than the amount being taken in (Venes, 2009). *Hyponatremic dehydration occurs when the lost fluid contains more sodium than the blood or more sodium than water is lost.* Because the serum sodium is low, intravascular water shifts to the extracellular space, and then into the bodie’s cells. “Hyponatremia can result in cellular swelling and is first manifested in the CNS. The water in the extracellular space lowers plasma osmoality shifting fluid into the brain cells, causing irritability, apprehension, confusion, seizures, and even coma” (Lewis, et al., 2011, p. 313).

There can be many factors contributing to the negative water balance especially in the case of I.S. *In people with diabetes, elevated blood sugar levels cause sugar to spill into the urine and water then follows. The inability to drink adequately as a result of decreased level of consciousness or impaired swallowing is another potential cause of dehydration (Lewis, et al., 2011).* I.S. is on a diuretic, Furosemide, for hypertension
which further increases her water loss. ACE inhibitor use, also taken for HTN, blocks the transformation of angiotensin I to angiotensin II by inhibiting angiotensin converting enzyme. Angiotensin II is a potent vasodilator and also causes release of the hormone Aldosterone from the adrenal cortex. Aldosterone stimulates sodium retention to increase water reabsorption in the tubules of the kidney. Because of her ACE inhibitor, I.S. is secreting more Na+ than absorbing contributing to dehydration and hyponatremia.

To summarize I.S.’s pathophysiology, she suffers type II diabetes mellitus and hypertension that are both poorly managed. Chronic hyperglycemia and damage from long standing increased vascular pressure lead to the development of retinopathy, glaucoma, chronic renal insufficiency, and coronary artery disease. The most severe complication I.S. suffered was a stroke in 2005 that resulted in severe dementia, dysphagia, and complete immobility. Immobility, decreased LOC, DM, and dysphagia have resulted in further complications of infection and dehydration requiring hospitalization for treatments.
Analysis of Laboratory Data and Diagnostic Tests

Electrolytes

<table>
<thead>
<tr>
<th>Date</th>
<th>Na+ 133-145 mEq/L</th>
<th>K+ 3.3-5.1 mEq/L</th>
<th>Cl- 96-108 mEq/L</th>
<th>CO2 21-31 mEq/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/12/12</td>
<td>139</td>
<td>3.7</td>
<td>107</td>
<td>23</td>
</tr>
<tr>
<td>11/11/12</td>
<td>135</td>
<td>4.6</td>
<td>100</td>
<td>20 (L)</td>
</tr>
<tr>
<td>11/10/12</td>
<td>132 (L)</td>
<td>4.7</td>
<td>100</td>
<td>20 (L)</td>
</tr>
<tr>
<td>11/9/12 P.M.</td>
<td>129 (L)</td>
<td>4.8</td>
<td>99</td>
<td>20 (L)</td>
</tr>
<tr>
<td>11/09/12 A.M.</td>
<td>121 (L)</td>
<td>5.6 (H)</td>
<td>52 (L)</td>
<td>---</td>
</tr>
</tbody>
</table>

Initially, I.S. was brought to the E.D. because of a decreased level of consciousness that could have been related to hyponatremia. The sodium content of the blood is normally balanced by dietary intake and renal excretion that are both impaired because of dysphagia, altered mental status, and renal insufficiency related to DM. I.S. was previously taking Furosemide, a diuretic that blocks reabsorption of sodium, chloride, and water at the kidney tubules (Pagana & Pagana, 2011). Furthermore, the ACE inhibitor I.S takes daily increases sodium loss because it prevents the release of Aldosterone that promotes sodium retention.

Associated with hyponatremia, I.S. had related hypochloremia when admitted. “Chloride has a negative charge and main purpose is to maintain electrical neutrality as a salt along with sodium” (Pagana & Pagana, 2011, p.257). Chloride follows sodium (positive charge) losses, and is therefore affected by all of the same factors that contribute
to sodium loss. I.S.’s chloride level was increased to normal limits when given IV 0.9% NaCl in water or Normal Saline for treatment.

Potassium in I.S. is also disrupted because of dehydration, ACE inhibitor use, and chronic renal insufficiency. Aldosterone causes potassium loss as sodium is reabsorbed. Because of ACE inhibitor use there is a decreased production of aldosterone limiting the amount of potassium excreted. The kidney’s inability to concentrate urine because of damage to the nephrons further decreases potassium loss. Also, because I.S. suffers from chronic hyperglycemia, water and potassium losses are increased to decrease acidic condition that may be found in the blood (Pagna & Pagna, 2011). “Acidotic states can raise serum potassium levels by causing a shift of potassium into the extracellular fluid” (Pagna & Pagna, 2011, p. 774).

Carbon dioxide measurements are mostly used as a rough guide to a patient’s acid-base balance. Because there is inaccuracy associated with the test, arterial blood gases are preferred. In this case I.S.’s low CO2 is related to metabolic acidosis that is common in persons with kidney failure and diabetes (Pagna & Pagna, 2011). Metabolic acidosis is also evidenced by a bicarbonate level (HCO3) of 19 that was checked when I.S. was admitted. Metabolic acidosis is caused by diabetes mellitus and also severe infection. Treatment of I.S.’s infection and dehydration appear to have resolved her electrolyte imbalances.
Chemistry Profile

<table>
<thead>
<tr>
<th>Date</th>
<th>Ca+, total</th>
<th>Glucose</th>
<th>BUN</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/12/12</td>
<td>8.8</td>
<td>249 (H)</td>
<td>29 (H)</td>
<td>0.91</td>
</tr>
<tr>
<td>11/11/12</td>
<td>8.3 (L)</td>
<td>283 (H)</td>
<td>27 (H)</td>
<td>0.93</td>
</tr>
<tr>
<td>11/10/12</td>
<td>8.0 (L)</td>
<td>220 (H)</td>
<td>25 (H)</td>
<td>0.95</td>
</tr>
<tr>
<td>11/09/12</td>
<td>8.0 (L)</td>
<td>55 (L)</td>
<td>29 (H)</td>
<td>0.95</td>
</tr>
</tbody>
</table>

Low calcium (hypocalcemia) is a measure of free calcium and also calcium that is bound to albumin, contributing to half of total calcium. As result, “if serum calcium is low (as in malnourished patients), the calcium level will also be low” (Pagana & Pagana, 2011, p. 214). I.S. also presents with low albumin values which will be discussed in the next section. Another cause is renal insufficiency and the inability of the kidneys to excrete phosphate. Phosphate is inversely related to calcium. However, these values were not analyzed during the course of I.S.’s hospitalization. Lastly, “vitamin D is a necessary cofactor for calcium absorption in the intestines and may also facilitate calcium reabsorption in the kidney tubules” (Copstead & Banasik, 2010, p.607). In chronic renal failure, production of vitamin D by the kidneys is impaired resulting in low calcium levels. I.S. calcium level has increased since admission. She is not currently taking a calcium supplement, although was previously prescribed one in May. She has been
consuming milk during all of her meals which may be adequate based on trending lab values.

Poor control of Diabetes Mellitus is also manifested on I.S.’s chemistry profile. When she was first admitted she was hypoglycemic which may have been another contributor to her decreased LOC. After admission, the attending physician prescribed Solumedrol and subcutaneous morning insulin injections. After several days I.S.’s labs showed repeated high glucose levels. She was discontinued from the Solumedrol, placed on Prednisone, and given a nightly dose of insulin as well.

Elevated BUN refers to an inadequate excretion of urea related to renal dysfunction. BUN is also elevated a result of dehydration and can be elevated by the some of the medications I.S. is currently receiving (eg., Furosemide, Aspirin, and Rocephin) (Pagana & Pagana, 2011).

**Nutrition/LFTs**

<table>
<thead>
<tr>
<th>Date</th>
<th>T. Protein</th>
<th>Albumin</th>
<th>Bilirubin</th>
<th>Alk. Phos</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/10/12</td>
<td>5.4 (L)</td>
<td>2.7 (L)</td>
<td>0.3</td>
<td>76</td>
</tr>
<tr>
<td>11/09/12</td>
<td>7.1</td>
<td>3.6</td>
<td>0.5</td>
<td>95</td>
</tr>
</tbody>
</table>

Total protein and albumin are signs of nutritional status and liver function because the liver synthesizes albumin. I.S.’s liver does not seem to be the cause of her decreased protein based on additional labs taken that reported (ALT 12 and AST 19) liver enzyme
levels are within normal limits. Bilirubin and alkaline phosphate are also both normal indicating no liver dysfunction. Decreased protein and albumin are probably related to a negative nitrogen balance related to her current illness, and also decreased intake. As stated earlier I.S. has difficulty eating and a poor appetite.

**CBC**

<table>
<thead>
<tr>
<th>Date</th>
<th>WBC</th>
<th>RBC</th>
<th>HGB</th>
<th>HCT</th>
<th>PLT</th>
<th>MCV</th>
<th>MCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/12/12</td>
<td>7.4</td>
<td>4.05</td>
<td>11.4</td>
<td>34.8 (L)</td>
<td>334</td>
<td>86.0</td>
<td>32.8</td>
</tr>
<tr>
<td>11/11/12</td>
<td>18.5 (H)</td>
<td>3.94</td>
<td>11.1</td>
<td>33.8 (L)</td>
<td>300</td>
<td>86.8</td>
<td>32.9</td>
</tr>
<tr>
<td>11/10/12</td>
<td>23.5 (H)</td>
<td>3.82</td>
<td>10.9</td>
<td>32.3 (L)</td>
<td>304</td>
<td>84.7</td>
<td>28.5</td>
</tr>
<tr>
<td>11/09/12</td>
<td>36.4 (H)</td>
<td>3.89</td>
<td>10.6</td>
<td>32 (L)</td>
<td>443</td>
<td>82.2</td>
<td>27.4</td>
</tr>
</tbody>
</table>

Leukocytosis is an elevated white blood cell count above the normal range. As you can see, I.S.’s WBC count is extremely high in correlation with her infection of pneumonia and also UTI. I.S. was given antibiotics of Rocephin and Zithromax in the E.D., and continued with the Zithromax IV infusions for a total of 3 days. As of 11/12/12 her infection seems to be resolved as evidence by her WBC within normal limits.

“Anemia is not a disease but rather a symptom of other illnesses” (Venes, 2009. p.115) I.S. has suffered from chronic anemia in correlation with renal insufficiency. The kidneys are responsible for the production of the hormone erythropoietin that stimulates
the production of red blood cells (RBC’s) in the bone marrow (Venes, 2009). Because of I.S.’s renal dysfunction she has decreased amounts of erythropoietin. Also advanced age and women have greater risks of becoming anemic (Paganda & Paganda, 2011). As mentioned in previous sections, I.S. was diagnosed with anemia and given an iron supplement that does not seem to be effective in managing her anemia. Hematocrit (Hct) and Hemoglobin are closely reflected by the RBC count and the abnormal values reflect the same pathologic states (Paganda & Paganda, 2011). Although I.S.’s anemia was not resolved during her stay at the hospital, it did improve as result of two blood transfusions she received on 11/10/12.

**Urinalysis**

<table>
<thead>
<tr>
<th>Color: yellow</th>
<th>Nitrite: negative</th>
<th>Glucose: negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance: cloudy</td>
<td>WBC: &gt;100 (H)</td>
<td>Blood: moderate</td>
</tr>
<tr>
<td>WBC esterase: large</td>
<td>RBC: 2-5 (H)</td>
<td>pH: 5.5 (L)</td>
</tr>
<tr>
<td>Protein: 100 (H)</td>
<td>Mucus: none</td>
<td>Bacteria: many</td>
</tr>
<tr>
<td>Ketones: negative</td>
<td>Bilirubin: negative</td>
<td>Sq. Epith: none</td>
</tr>
<tr>
<td>Urobilinogen: 0.2</td>
<td>Specific Gr: 1.025</td>
<td></td>
</tr>
</tbody>
</table>

Urinary tract infections are a common cause of decreased level of consciousness in the elderly. A clean catch straight catheterization was performed in the ED when I.S. first arrived. I.S. Urinary analysis (UA) shows evidence of infection and renal
insufficiency. “Cloudy urine may be causes by the presence of RBC, bacteria, or pus” (Pagana & Pagana, 2011. p.1001). Leukocyte esterase and WBCs in the urine signify a urinary tract infection. Protein in the urine is consistent with I.S.’s renal insufficiency. Because of renal insufficiency, proteins in the urine are going to be a “normal” finding for I.S. Acidic urine (ph lower than 7.0) is observed in patients suffering from acidosis and is also a result of dehydration.

**Diagnostic Tests**

11/09/12 – CT scan of head – After being brought to the ED images of the brain of I.S. were obtained to rule out stroke. Images showed moderate cerebral atrophy consistent with normal ageing, patchy deep white matter and hydrodensities and previous lacunar infarct. Results were compared to a CT taken on 5/4/12 and no significant changes were noted.

11/09/12– Pelvis X-ray– Falls are common in the elderly, and fractures commonly manifest with an alteration in LOC. To rule out a fracture related to a possible fall a pelvis X-ray was performed showing no fractures and normal degenerative changes.

11/09/12– Chest X-ray– Performed and compared to a 5/4/12 chest x-ray. Results showed increased bilateral infiltrates, mild cardiomegaly as result of HTN, right shoulder prosthesis and a calcified aorta that remained in stable condition. Based on these results a diagnoses of bilateral pneumonia was made.

11/09/12 –EKG–Past medical history of DM, HTN, CAD, and stroke increase her risk for myocardial infarction. Also, hyperkalemia can cause cardiac arrhythmias.
Fortunately for I.S., her EKG showed a normal sinus rhythm with no apparent cardiac complications.

11/09/12 – Urine Culture – To isolate causative organisms and give appropriate medications for treatment. After 24 hours there was a growth of E. coli and Citrobacter koseri from the culture. Both organisms are gram negative bacteria that are part of our normal flora. These results indicated the cause of I.S.’s UTI is probably related to incontinence and poor hygiene.

11/10/12 – Chest X-ray was done to monitor the client’s pneumonia and effects of treatments. X-ray showed evidence of osteoporosis and a partial clearing of patchy bilateral air space opacities. This evidence supports her antibiotics are working and her infection may be resolving.

**Therapeutic Management**

**Treatments**

I.S. received regular visits from Respiratory Therapy (RT) to receive nebulizer treatments. Because of the increased production of secretions involved with the inflammatory process related to pneumonia, and her decreased ability to cough, I.S. was having difficulty maintaining an open airway. A nebulizer is a machine that vaporizes liquid medication into a fine mist to be inhaled into the lungs via a mouthpiece or mask (Venes, 2009).

I.S. was prescribed levalbuterol (Xopnex), as needed every hour for wheezing and signs of respiratory distress. Levalbuterol will be discussed in greater detail in the medications
part of this section. During the first four days of hospitalization, I.S. received a total of 4 treatments that were effective in decreasing wheezing.

Nutritional status of I.S. is poor related to her chronic conditions and difficulty swallowing. Following her stroke, dysphagia prevented I.S.’s ability to tolerate a regular diet. To prevent choking and aspiration, I.S. consumes a chopped diet with nectar thick liquids. Also, because of her diabetes, HTN, and CAD her diet order is an American Diabetic Association (ADA) and Cardiac Care Diet (CCD). Diabetic diets are high in fiber, low in fat, and low in carbohydrates to prevent large spikes in blood sugar. Cardiac diets are designed to reduce the risk of heart disease and focus on low sodium (to prevent HTN), low fat and cholesterol, and healthy fruits and vegetables. Although this diet is designed to be therapeutic there is little evidence to suggest showing either are helping. I.S. has shown a decreased interest in food since she has arrived, and has been eating scant amounts of food. She is able to tolerate thickened liquids, but is unable to hold a cup or drink without assistance.

To ensure the safety of I.S., after assessment by PT/OT and also speech therapy she has been placed on aspiration and fall precautions. Both are signaled on her medical chart, Kardex, and white board in her room. Aspiration precautions include elevating the head of the bed thirty degrees or greater, oral suction available at bedside, one to one feedings, and remaining upright in a chair for at least one hour after eating. Fall precautions implemented for I.S. are minimal because of her lack of mobility. When seated in her chair, I.S. in placed near to nurses station so she can be monitored more closely. When in bed, all four side rails are pulled up to prevent rolling out of bed or
getting up without assistance. I.S. has not suffered any complications since hospitalization related to falls or aspiration.

**Medications**

Normal Saline (0.9% NaCl) at 75ml/hr continuous IV fluid therapy, an isotonic fluid with added electrolytes given for fluid replacement. Laboratory studies showing normal chloride and sodium levels, assessment of skin turgor, and normal urinary output evidence IV therapy is effective in resolving dehydration and electrolyte imbalances. Mucus membranes were also moist and pink on dates of care, and there was no evidence of volume depletion.

ceftriaxone (Rocephin) 2g IV and cefuroxime (Ceftin) 250mg PO daily are both anti-infectives that “binds to the bacterial cell wall causing cell death” (Deglin & Vallerand, 2009, p.300). I.S. was given Rocephin once in the ED for diagnosis of UTI and pneumonia. On 11/10/12 X-ray results showed clearing of lungs indicating medication worked. Ceftin was prescribed on 11/14/12 after IV antibiotic therapy was no longer necessary.

azithromycin (Zithromax) 500mg IV q 12hrs for 24hours, “inhibits bacterial protein synthesis” that eventually results in the death of the microorganism (Deglin & Vallerand, 2009, p. 214). This medication is effective in treating respiratory infections and based on a decrease in WBC’s from admission.

levalbuterol (Xopenex) 3ml prn every hour for wheezing, binds to Beta-2 adrenergic receptors causing relaxation of airway smooth muscle causing bronchodilation (Deglin & Vallerand, 2009). As the beginning of I.S.’s stay in the hospital she required
frequent administration via nebulizer. As of 11/14/12 I.S.’s infection was resolved to the point where these treatments were no longer necessary.

Prednisone 40mg each day, suppresses inflammation and the immune response that is associated with pneumonia. I.S. was switched to Prednisone after a similar drug Solumedrol was causing severe hyperglycemia. I.S. still presented with bilateral wheezing on 11/16/12, inflammation is likely to still be present based on these findings.

Lisinopril (Prinivil) 20 mg oral BID, is an antihypertensive, “ACE inhibitors blocks the conversion of Angiotensin I to the vasoconstrictor Angiotensin II” (Deglin & Vallerand, 2009, p. 176). As mentioned in previous sections I.S. has suffered electrolyte imbalance and dehydration because of ACE inhibitor use. However, because of I.S.’s previous complications related to hypertension the benefits outweigh the risk. ACE inhibitors may also help decrease to progression of kidney failure in patients who suffer from nephropathy (Lewis, et al., 2011).

Hydralazine 50mg PO TID, is an “antihypertensive medication that causes peripheral arteriolar vasodilatation, reducing blood pressure (Deglin & Vallerand, 2009, p. 214). Hydralazine also increases sodium absorption, cerebral, and renal blood flow. With the understanding of I.S.’s high risk for stroke and total kidney failure related to her HTN, this drug seems like an appropriate choice for I.S.

Metoprolol (Lopressor) 25mg PO BID, is an antihypertensive beta blocker. This is a new medication prescribed for I.S. because of the previous medications were unsuccessful in reducing blood pressure. Metoprolol blocks beta adrenergic receptors decreasing heart rate and also blood pressure. On 11/15/12 0800 BP of I.S. was 173/49
prior to giving the previous three BP medications. BP at 1200 was 142/80 showing a
decrease, but a level that is still above normal limits.

furosemide (Lasix) is a loop diuretic that was previously indicated for this patient
to help manage hypertension. It inhibits the reabsorption of sodium and chloride from
the loop of Henle and distal renal tubule. Because it also increases renal excretion of
water, sodium, chloride, and calcium this medication was discontinued because of the
associated dehydration, hyponatremia, hypochloremia, and hypocalcemia (Deglin &
Vallerand, 2009).

acetylsalicylic acid (Aspirin) 81 mg PO daily, is an antipyretic non-opiod
analgesic. It was indicated for the patient as “prophylaxis of transient ischemic attack
and MI by decreasing platelet aggregation” (Deglin & Vallerand, 2009, p. 1131). The
administration seems to be effective in that the patient has not exhibited any additional
cerebrovascular damage or myocardial damage as evidence by EKG and CT scan.

nitroglycerin (Nitrodur) 0.2mg 1 patch once a day off in the evening, is an
antianginal nitrate that “increases coronary blood flow by dilating coronary arteries”
(Deglin & Vallerand, 2009, p. 929). The medication is taken to reduce myocardial
ischemia and chest pain related to coronary artery disease.

docusate sodium (Colace) 200mg/20 mL, is a laxative or stool softener. It was
ordered by the physician because the patient has failed to produce a BM since 11/11/12.
Colace promotes incorporation of water into stool, resulting in softer fecal mass (Deglin
& Vallerand, 2009). It is yet to be determined if I.S. will have a bowel movement.
Colace is also an important medication in cardiac patients because straining with stool
can initiate the vasovagal response that causes a decreased HR, BP, and may cause a loss of consciousness.

  dorzolamide HCL 2% (Cosopt) 1 drop to both eye TID, and Latanoprost 1 drop each night to both eyes are carbonic anhydrase inhibitors that decreases formation of the aqueous humor (Deglin & Vallerand, 2009). Decreasing the production of aqueous humor decreases IOP associated with glaucoma. I.S. poor vision does not seem to be effected by taking this medication. Nevertheless, I.S. does not appear to be in pain that is associated with Glaucoma. Indications of pain in I.S. may manifest as agitation, grimacing, moaning, guarding, increased HR and RR.

  Insulin mixture (Novolin 70/30) 10 units subq BID and insulin aspart (Novalog) sliding scale, 0.01 unit/0.0001 mL sub Q are both classified as antidiabetics and pancreatics. The action is to “… lower blood glucose by stimulating glucose up-take in skeletal muscle and fat, and by inhibiting hepatic glucose production (Deglin & Vallerand, 2009, p. 721). The uses of rapid, regulars and long acting insulin are intended to control hyperglycemia related diabetes. When I.S. first arrived at the hospital her CBG’s were repeatedly high, and an additional dose of Novolin was added in the evening. On the morning of the 11/16/12, I.S.’s insulin was 33 indicating too much insulin causing hypoglycemia. Her night dose was then discontinued, and the sliding scale was implemented to keep tight control over blood glucose.

  pantaprozole (Protonix) 40 mg oral daily, is an antiulcer, proton pump inhibitor which is to prevent development of stress ulcers. “It binds to an enzyme in the presence of acidic gastric pH, preventing the final transport of hydrogen ions into the gastric
lumen” (Deglin & Vallerand, 2009, p. 990). No clinical manifestations of stress ulcer have been observed.

References


Faculty Report on College-wide Academic Student Learning Outcomes (CASLO) Evidence

Program: Nursing Course: NURS230

CASLO Focus:
- Critical Thinking
- Written Communication
- Oral Communication
- Creativity
- Information Literacy
- Quantitative Reasoning
- Information Literacy

Student sample has been rated:
- Exemplary level
- Minimal level

Your course has been selected for this activity because it requires exit-level skills for the indicated CASLO focus and program. Please consider the following guidelines as you select appropriate evidence of student learning for this activity:

- Select two samples of student work, one that demonstrates exemplary achievement of the CASLO and another that demonstrates achievement at (or near) the minimal level required for students passing with at least a “C.” Choose evidence from an “embedded” assignment, project, or exam that normally exists as part of your course.

- Review the statements associated with the relevant CASLO standard (see attached) to assure that the evidence correlates adequately with the CASLO. In general, choose evidence which corresponds to at least fifty percent of the outcome statements.

- Select evidence produced with an appropriate degree of independence. In general, student work guided by significant external direction is not appropriate for this activity.

Please briefly describe your assessment of the evidence; identify qualities in the student work that establish its level of achievement for the CASLO:

In NURS230 students select a patient that they have cared for in the hospital during their practicum and write a paper demonstrating their understanding of the holistic care of the patient. Their goal is to synthesize a large amount of data and demonstrate an understanding of how the many physiologic concepts interact in a specific patient to guide individualized care. They are expected to collect, organize, and analyze the data, utilizing the paper to convey their understanding of how all the data interconnects.

In this sample, the student demonstrates minimally sufficient achievement in conveying understanding of the patient situation to the reader. Development of the main idea is mostly coherent: key data is provided, but there are some inconsistencies, gaps, and pieces of data that come as a surprise to the reader later in the paper. Details are presented but often without interpretation and without a clear portrayal of how all of the pieces fit together. Sentences generally adhere to academic writing conventions and rules of grammar, but there is at least one incomplete sentence, the person shifts between 2nd and 3rd person, acronyms are used without initial reference to the meanings, punctuation is missing in more than one place in the references. Research is incorporated in support of ideas, and source materials are generally integrated, but information is included in the medication section about several drugs without any citations.

Continue on next page.
Please briefly describe course work designed to prepare this student to demonstrate this CASLO:

This course (NURS230) is the last in the first year of the nursing program; prerequisites to the program and to this class begin to prepare students for this assignment:

* ENG100 (Composition 1)
* Writing-intensive NURS210 course
* Concept map assignment in NURS220 (creating a concept map for a patient showing interconnections between concepts and care plans)
* Library orientations in NURS210 & NURS220 (with focus on finding and utilizing nursing research)
* NURS211 (Professionalism in Nursing) with focus on use of APA format for scholarly writing
* In this course: weekly written nursing care plans, medication lists, lab analysis, and focused preparation questions for patients in practicum with written feedback from clinical instructors
History and Assessment

Precipitating Events

On July 15th of 2012 at 1630, EMS was dispatched to the home of a sixty-three year old Hawaiian man with a chief complaint of syncope followed by slurred speech and confusion. According to the report, the 265-pound male was alert and oriented to nothing and was sitting slumped in the chair of a walker with wheels with an obtunded affect. The medic was unable to palpate a peripheral pulse and the Maui fire department on scene was unable to get a blood pressure. The patient was immediately lifted onto a gurney, during which the patient showed limp legs, head drooping, and inability to assist. Once supine, the patient became verbal and stated that he was “feeling better.” Patient was able to move both arms and the right leg. He denied chest pain, dizziness, or shortness of breath. His wife stated that at approximately 1630, the patient had a syncopal event in the bathroom, which resulted in him slumping gracefully to the floor. The son and daughter were able to transfer him to the walker where he started displaying signs of slurred speech and confusion, claiming he was gambling in Las Vegas.

Medical Surgical History

The patient has an extensive past medical history including DM II, hyperlipidemia, COPD, obstructive sleep apnea, interstitial lung disease, recurrent infections, and obesity hypoinflation syndrome. R.L. had colorectal CA resulting in bowel resection and subsequent colostomy. He has paroxysmal atrial fibrillation, which was a contributing factor for his transport to telemetry. Following his cardiac arrest he experienced periods of atrial fibrillation and atrial flutter, which had resolved upon admission.

Social History

The patient is married with a son, a daughter, and five grandchildren. His wife and children were on the scene when he experienced syncope and was transported to the hospital. He is a Hawaiian male who was born and raised in Hawaii and currently resides in the Lahaina area. He denies ever smoking and
denies alcohol use, as well as recreational drugs use. His chart indicates that he has not specified any religion and that he claims disability through an occupational injury, though the type of work and injury is not specified. No family history is listed in the chart either and a thorough history was not taken due to patient's non-verbal status.

**Course of Hospitalization**

Following the patient's experience in the Emergency Department, the patient was transferred to telemetry for observation. While under observation, the patient suffered a code blue and was resuscitated successfully. After this, the patient was transferred to the intensive care unit. Once stabilized, the patient was transferred to Hale South until finally being transferred to Maui South where I was fortunate enough to help care for him. In the course of his hospitalization, the patient has received multiple surgical procedures including a tracheostomy and PEG tube placement in July and an exploratory laparotomy in August that resulted in the discovery of a sigmoid volvulus. In his current state, the patient is alert and oriented to time, place, and person. His level of performing ADLs is limited because of his tracheostomy tube and weakened gait. He has been on bed rest for the majority of his hospitalization, but recently began working closely with physical therapy and respiratory therapy to increase ambulation. My own observations of these interactions led me to witness the patient transfer with assistance from the bed to a walker and out into the hallway.

**Pathophysiology**

R.L. has a complex medical history, therefore only the most pertinent medical diagnoses will be discussed in this section.

**Atrial Fibrillation**

Atrial fibrillation is a completely disorganized and irregular atrial rhythm that is accompanied by an irregular ventricular rhythm of a variable rate. The majority of the atrial depolarizations within the SA node and myocardial cells are blocked by the AV node, resulting in only a few impulses reaching the ventricles
for contraction. Atrial fibrillation causes the atria to quiver rather than contract, which causes blood to pool within the atria and thrombi to form (Copstead, L.C. & Banasik, J.L., 2010, p. 480). In R.L., this is the likely origin of his stroke, as the thrombi likely traveled to the circulatory system in the brain. This is also the likely reason that the patent was on aggressive anticoagulation therapy.

**Acute Respiratory Failure**

Acute respiratory failure is defined as, “a state of disturbed gas exchange resulting in abnormal arterial blood gas values, a PaO₂ value less than 60mmHg(hypoxemia) and a PaCO₂ value greater than 50mmHg(hypercapnia), with a pH less than 7.30 when the patient is breathing room air” (Copstead, L.C. & Banasik, J.L., 2010, p. 530). The etiology for R.L. is multifactorial, including obstructive sleep apnea, interstitial lung disease, recurrent infections, and obesity hypoinflation syndrome. R.L. underwent a tracheostomy and is now dependent on a BiPAP machine for oxygenation. All attempts at weaning to this point have proven unsuccessful.

**Anemia**

Anemia is an erythrocyte disorder that is defined as a deficit of red blood cells. An anemic patient will experience tissue hypoxia because of the low oxygen-carrying capacity of the blood. R.L. was diagnosed with microcytosis of the red blood cells by his primary care physician. Microcytosis is a blood disorder where the red blood cells are unusually small. The most common cause of Microcytosis is iron deficient anemia. Iron deficiency in adult men usually warrants further G.I. investigation for occult blood loss, including evaluation for G.I. malignancies (Copstead, L.C. & Banasik, J.L., 2010, p. 313). R.L. has a Hx of colorectal CA resulting in bowel resection and subsequent colostomy.

**COPD**

COPD is an acronym for chronic obstructive pulmonary disease. The most common cause of this disease is smoking, but in the case of R.L. the likely cause is repeated airway infections. The form of COPD that R.L. likely has is chronic bronchitis, which is defined as, “chronic inflammation and swelling of
the bronchial mucosa resulting in scarring, increased fibrosis of the mucous membranes, hyperplasia of bronchial mucous glands and goblet cells, hypertrophy of bronchial glands and goblet cells, and increased bronchial wall thickness, which potentiates obstruction to airflow” (Copstead, L.C. & Banasik, J.L., 2010, p. 547). This was likely a contributing factor in R.L.’s acute respiratory failure. It is being treated presently with the use of the BiPAP machine.

**Diabetes Mellitus Type 2**

Type 2 diabetes is characterized by a relative lack of insulin. The processes instrumental in producing the relative lack of insulin are insulin resistance and β-cell (Copstead, L.C. & Banasik, J.L., 2010, p. 949). R.L is not currently on any anti-diabetic medications. The probable reason for lack of insulin therapy is due to his comfort care status. Due to insulin resistance, frequent infections and other symptoms, such as anorexia, nausea and vomiting, maintaining the blood glucose at “normal” levels is very difficult, if not impossible. Treatment with anti-diabetics for terminally ill patients may increase the risk of hypoglycemia. In palliative care, where the goal is to control symptoms without inducing adverse effects, wider ranges of blood glucose may be observed. The ranges between 8 and 15 mmol/L (150–250 mg/dL) could be considered normal.

**Sigmoid Volvulus**

Volvulus is twisting of the bowel on itself, causing intestinal obstruction and blood vessel compression. The two most common sites for the development of volvulus are the cecum and the sigmoid colon. A volvulus may be the result of an anomaly of rotation, an ingested foreign body, or an adhesion; however, the cause cannot always be determined. Volvulus tends to occur in patients with coexistent medical conditions. (Copstead, L.C. & Banasik, J.L., 2010, p. 846).

**Labs and Diagnostics**

**Admission Labs**
On the day that R.L. was admitted, some selective labs were drawn that were deemed pertinent to the patient’s current condition. He had a troponin level drawn, which came back with value of 0.06. This level is within the normal range, as it is less than 0.1. The patient also had a D-dimer level drawn, which came back as an elevated reading of 0.9. The fragmented D-dimer test assesses thrombin and plasmin activity; plasmin works on the fibrin polymer clot, resulting in fibrin degradation products and D-dimers. The results of the patient R.L. suggest that he has had a higher level of fibrinolysis than the average person, which could be explained by the chronic anticoagulation therapy that the patient was receiving prior to admission. The other lab values drawn on admission are listed in the table found under the following heading, in the column labeled July 15th. The abnormal values include a low sodium level, a low chloride level, and high BUN, creatinine, and glucose levels.

The low levels of chloride can be from multiple origins such as over-hydration, vomiting, chronic gastric suctioning, salt-losing nephritis, metabolic alkalosis, and respiratory acidosis. At the time of admission, it was not noted that the patient presented with any of these conditions. However, sodium-losing nephritis might be indicated by the low sodium level, elevated BUN and creatinine levels, which reflect poor kidney function. The low sodium level has several similar causative factors including over-hydration, poor dietary intake, diarrhea, vomiting, renal insufficiency, and peripheral edema. In early assessments of R.L., some peripheral edema was noted, which could explain the patient’s admitting level. The high glucose level is explained by the patient’s chronic disease Diabetes Mellitus Type 2. Please review the pathophysiology section for a more detailed discussion of this disease.

Finally, I will address the elevated BUN and creatinine levels. Creatinine is a catabolic product of creatine phosphate, which is used in skeletal muscle contraction. Along with BUN, creatinine is excreted entirely by the kidneys and is therefore a good determinate of kidney function. High levels of either of these two labs could indicate poorly functioning kidneys. There are a few exceptions as to why creatinine and BUN would be elevated, and they include: shock, dehydration, atherosclerosis, and urinary tract
obstructions. Along with the DMII, the presence of hyperlipidemia in the patient’s previous medical history would likely indicate that the patient has atherosclerosis and that both diseases are affecting kidney function.

### More Current Lab Analysis

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</tbody>
</table>

The table above shows a small look at labs during the time of admission for R.L. and his most recent labs. It shows that some lab levels have been treated and managed, while others have been problems for the duration of the hospital stay. R.L. has a diagnosis of chronic anemia, which would present with the consistently low levels of RBCs, hemoglobin, hematocrit, MCH, and MCHC, as well as the high RDW levels. If the anemia had been the result of a dietary deficiency, the hospital would have adjusted the patient’s diet to treat this. However, according to a patient history that was transferred to the patient's chart
from his primary care physician, Dr. Galen Wiger diagnosed R.L. with microcytosis of the red blood cells several years ago. As a result, R.L. has had these chronic lab values and on occasion has needed blood transfusions of packed red blood cells. He has received two during this hospital stay; one on August 15th and another August 26th.

The patient showed elevated CO₂ levels when the labs were drawn for this value. A high CO₂ level may be a result of R.L.’s loop diuretic use or his disease process known a COPD, which is discussed under the pathophysiology section. Other abnormal lab values that were not discussed yet are the calcium, PT, INR, and PTT levels. The consistently low calcium levels may be explained by the client’s chronic use of aspirin and loop diuretics, as well as his previous long-term use of anticoagulants. Renal issues can also lead to low levels of calcium. The PT, INR, and PTT labs are all used to measure clotting time. The elevated levels of the patient indicate that it takes a longer than average amount of time to efficiently use the clotting mechanism. When the patient was on chronic anticoagulation therapy, using products such as heparin and warfarin, it would not be abnormal to have elevated readings. However, when I came to care for the patient, he was no longer using these medications. Although it is unclear what day he ceased the use of these medication, I believe it was probably around the time his last lab analysis for these values were drawn, which was in the middle of September.

<table>
<thead>
<tr>
<th>UA 7/17</th>
<th>Color: yellow</th>
<th>Urobilinogen: 4.0</th>
<th>Bilirubin: +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance: Clear</td>
<td>Nitrite: -</td>
<td>Specific Gravity: &gt;1.030</td>
<td>pH: 6.1</td>
</tr>
<tr>
<td>WBC esterase: -</td>
<td>WBC: -</td>
<td>Protein: 100</td>
<td>RBC: -</td>
</tr>
<tr>
<td>Glucose: -</td>
<td>Bacteria: -</td>
<td>Ketones: -</td>
<td>Mucus: -</td>
</tr>
<tr>
<td>Blood: Large</td>
<td>Sq. Epith: -</td>
<td>Sq. Epith: -</td>
<td></td>
</tr>
</tbody>
</table>
The patient only had one abnormal urinalysis and it was taken on July 17th; the results are shown above. The abnormalities included a high urobilinogen, a positive bilirubin finding, a high specific gravity, and a large amount of both protein and blood detected. Bilirubin and urobilinogen are values that correspond with one another. The presence of bilirubin in urine suggests that either disease is affecting bilirubin metabolism after it is conjugated or there is a defect in excretion. Urobilinogen is the transformed product of bilirubin when it is met with the bacteria in the bowel. Most of the urobilinogen is excreted from the liver to the bowel, but some is excreted through the kidneys. The high specific gravity can be a result of dehydration, decreased renal blood flow, proteinuria, fever, sweating, vomiting, diarrhea, or other reasons. In the case of this patient, it is probably correlated to the high levels of protein in the patient's blood. These high levels of protein are likely a result of the patient's Diabetes Mellitus Type 2, as proteinuria is a common symptom of this disease. Finally, the causative factor for the presence of blood in the urine is difficult to determine, as there is no presence of WBC elevation to suspect infection. Therefore, a possible cause may have been a traumatic bladder catheterization, as the patient was receiving several procedures around the time of admission that may have required catheterization.

Other Diagnostics and Analysis

Echocardiograms

The patient has received two echocardiograms within the time of this hospitalization. The first was on July 16th and it was indicated due to the patient's rapid atrial fibrillation. The conclusions of the study were that the rhythm was atrial fibrillation with rapid ventricular responses. The left ventricle size was normal with mild to moderate hypertrophy and normal function. In addition, the left atria was found to be dilated. All other findings were normal. The second echocardiogram took place on August 13th and was indicated for the client due to severe shock. The new conclusions of this study were that there was definite mild left ventricular hypertrophy and an ejection fraction of 60%. The right ventricle was subsequently found to be dilated as well.
X-rays

I found three documentations for chest x-rays in the client’s chart for the period of this hospitalization. The first was on August 13th and the conclusions were that there was no interval change in the tracheostomy, the lung fields were hypoinflated, there was a probable left sided pleural effusion, there was mild bilateral congestion, and there were no pneumothoraces. The next chest x-ray was performed on August 14th and reported that the placement of the PICC line was good and there were no changes since the last x-ray. The most recent chest x-ray was performed on September 5th and it showed suspected central pulmonary venous congestion, bibasilar pulmonary edema, and a large bilateral pleural effusion with more present in the left lung field than the right.

CT scan

Two CT scans were documented in R.L.’s chart. The first was a head CT and it occurred on August 12th. It was performed without contrast and the results were that there was generalized mild cerebral atrophy but no evidence of acute hemorrhage, focal edema, masses, midline shift, or large vessel infarction. The other CT scan was of the abdomen and pelvis, performed on August 14th. The findings were a small amount of pleural effusion in the lung bases, gallstones, free air was present in the abdomen, moderate ascites, and a thickening in the wall of the small bowel and sigmoid colon.

Therapeutic Management

Interventions and Patient Responses

PT, OT, RT, and Speech Therapy

After several unsuccessful attempts to wean the patient of ventilation, R.L. was discharged from the speech therapy treatments. However, the patient has continued to have regular visits from the physical therapist and occupational therapist since the time of admission. During my care, I witnessed the patient making great progress. With the respiratory therapist present, the physical therapist worked with R.L. and assisted him with transfer to a walker. Once up on his feet the patient was able to ambulate to his doorway
without needing any periods of rest. The following day, the physical therapist and respiratory therapist returned and were able to ambulate the patient in a walker all the way out into the hall to the nurses station and towards Maui north elevators. I would estimate that this is about 75 feet in total distance. R.L. maintained an sp02 of 97% or greater during ambulation. The goal for the R.L. is to help him ambulate at a level that his wife can manage at home. While listening to the case manager following these experiences with the PT, he said that the next step would be to begin weaning R.L. off of the BiPAP machine. Overall the patient was making remarkable progress in spite of his prognosis.

Scheduled Medications

Aspirin 81 mg each day

Aspirin is a type of salicylate, which is classified as an antipyretic and a non-opioid analgesic. The indications are varied for salicylates, from the treatment of mild to moderate pain, rheumatoid arthritis pain, osteoarthritis pain, and fever. Aspirin in particular, can be indicated for the prophylaxis of transient ischemic attacks and myocardial infarctions, which is what R.L. has been prescribed this medication for. This is especially obvious because of the small children's dose that was prescribed as well as the patient's history of a stroke and atrial fibrillation. The action of this medication is to produce analgesia and reduce inflammation and fever by inhibiting the production of prostaglandins. Aspirin also has the added bonus of inhibiting platelet aggregation, which could lead to thrombi. We can assume that this medication is effective, as the patient has suffered from no further strokes and the patient's PT, PTT, and INR levels are all within normal ranges or slightly elevated. Common side effects include gastrointestinal bleeding, dyspepsia, and nausea. Monitoring the output into the patient's colostomy bag shows me that there is no frank evidence of gastric bleeding and the patient has declined feelings of nausea and dyspepsia.

Famotidine 2.5mL BID

Famotidine is a histamine H2 antagonist which is therapeutically classified as an antiulcer agent. It is indicated for this client for prevention of stress-induced upper gastrointestinal bleeding that is common in
critically ill patients. It works by inhibiting the action of histamine at the H₂-receptor site located primarily in gastric parietal cells, which as a result inhibits the secretion of gastric acid. The patient has had no frank blood evident in the stool found in his colostomy bag and his only complaint of abdominal pain came from slight distention resulting from abdominal gas. The complete blood count is a set of labs that should be monitored throughout treatment with this drug. This is used as a way to find signs of bleeding. In this patient it is difficult to monitor because the patient has had chronic anemia, but it is important to establish a base line and then monitor for any abnormal decreases in levels. There have been no abnormal drops in the CBC ranges recently, so it can be reasoned that the patient is being effectively treated by this medication.

**Furosemide 40 mg QAM**

Furosemide was prescribed for this patient to control his hypertension as well as reduce the fluid in the patient's body, which has been a contributing factor in the patient's multiple pleural effusions and past presentations of pedal edema. Furosemide inhibits the reabsorption of sodium and chloride from the Loop of Henle and distal renal tubule. This causes an increase in the renal excretion of water, sodium, chloride, magnesium, potassium, and calcium. Assessments that are made to ensure that the medication is working therapeutically include vital signs to assess blood pressure and a head to toe assessment that listens to breath sounds and checks for edema. During my care, the patient only had one high blood pressure reading of 152/63, the others were all below 120/80. In all of my assessments there were no positive signs of edema, however, when listening to breath sounds I auscultated rhonchi that was only partially cleared with inline suctioning of his tracheotomy tube. If an increase in the dose of this medication is not appropriate, a restricted fluid intake may be an indicated treatment.

**Potassium Chloride 15mL**

Potassium chloride is a potassium supplement that was prescribed to this patient in order to counteract the effects of the furosemide discussed above. According to Davis' Drug Guide (2011, p. 1041)
it is indicated in the “treatment and prevention of potassium depletion.” Furosemide increases the renal secretion of potassium, which can cause hypokalemia and the dangerous side effect associated with it – cardiac dysrhythmias. The action of the potassium chloride is to replace the potassium in the body, maintaining acid-base balance, isotonicity, and electrophysiologic balance of the cell. The most accurate way to assess for the effectiveness of this medication is to monitor serum potassium levels. The most recent labs drawn for this patient’s electrolyte levels were on October 11th, in which the potassium level was 4.0 and within normal ranges. On my assessments, the patient showed no signs or symptoms of either hypokalemia or hyperkalemia. Other assessments that should be made are taking the pulse, blood pressure, and an occasional ECG reading. Other labs that can be monitored are renal function lans, serum bicarbonate, pH level, and serum magnesium.

Paroxetine Hydrochloride 10mL

Paroxetine hydrochloride is classified as an antianxiety agent and antidepressant. It is a selective serotonin reuptake inhibitor, which means that it works by inhibiting the reuptake of serotonin in the central nervous system, thus potentiating the activity of serotonin. It results in an antidepressant effect with decreased frequency of panic attacks, OCD, or anxiety. R.L., has had a history of problems with anxiety, which caused sleep problems for some time. When I came to care for him however, he seemed happy and was full of energy. According to the night nurses’ reports, he was sleeping well through the nights. The only time that he showed any signs of anxiety was when he was having suctioning performed in his tracheostomy tube or when he was viewing his large abdominal wound. His level of anxiety seemed to be within the expected levels of the average person, showing that the medication is being therapeutic. Important considerations for patients receiving this medication are monitoring appetite and nutritional status; monitoring mental status and assessing for suicidal tendencies; and observing for signs of serotonin syndrome. A CBC with differential should be drawn occasionally to observe for signs of anemia or leukopenia.
**Sotalol tab 40mg QAM**

Sotalol is a class III antiarrhythmic as well as a beta-blocker. It is indicated for this patient in the maintenance of normal sinus rhythm with underlying symptomatic atrial fibrillation or atrial flutter. It works by blocking the stimulation of beta_1_-adrenergic receptor sites in the myocardial cells and the beta_2_-adrenergic receptor sites in the pulmonary, vascular, and uterine cells. The effect is a more controlled heart rhythm as well as a decrease in blood pressure. The effectiveness of this medication is best observed using and ECG, but an irregular heart rhythm can be detected when checking a radial or apical pulse. It is also important to monitor blood pressure to make sure that the patient is not hypotensive. In all of my full assessments of the patient I listened to an apical pulse and felt for radial pulses, the patient had a regular rhythm in all instances.

**Zolpidem tartrate 5mg Q h.s.**

Zolpidem is classified as a sedative and hypnotic. It was prescribed to this patient for insomnia. It works by binding to GABA receptors, producing depression a central nervous system. According to Davis’ Drug Guide, it’s therapeutic effects are, “sedation and induction of sleep” (2011, p.1313). Because of its sedation effects it is important to assess the patient’s mental status and respiratory rate. To assess the effectiveness, the sleeping patterns should be monitored. This medication has been effective for R.L., as the night shift nurses’ have reported that the patient “slept well through the night.” One important thing to note about this medication is its tendency to create dependency when used for more than seven to ten days (Deglin, Vallerand, & Sanoski, 2011).

**Other prescribed medications**

The patient also had a prescription for xenaderm and collagenase, which are topical ointments used in wound care. Xenaderm was applied to a wound on the left buttock and it is a combination of balsam peru, castor oil, and trypsin. Balsam Peru is an effective capillary bed stimulant used to increase circulation in the wound site area and has a mildly bactericidal action. Castor Oil is used to improve
epithelialization by reducing premature epithelial desiccation and cornification. It can act as a protective covering and aids in the reduction of pain. Trypsin is intended for debridement of eschar and other necrotic tissue. Collagenase was applied daily to the patient’s large abdominal wound and the small wound on his left shin. The action of collagenase is to remove substrates necessary for bacterial proliferation and permit antibodies, leukocytes, and antibiotics better access to the infected area.

The patient was also prescribed medications on an as needed basis, which were not given during the period of my care. They include the following: 650mg of acetaminophen as needed for pain, 2mg of alteplase as needed for PICC line occlusion, 200mg of Robitussin DM as needed for cough, up to 25mg of diphenhydramine for insomnia at bedtime, 200mg of docusate sodium as needed for constipation, up to 5mg of haloperidol for anxiety, 5mg of metoprolol for a systolic blood pressure greater than 140, one applicator of 100,000 units nystatin powder as needed for rash, and up to 8 mg of ondansetron for nausea or vomiting.

**Concept Map**

The concept map for R.L. can be found in the Appendices (Appendix B).

**Interventions and Evaluations**

See the attached intervention template sheets (Appendix C).
References


