

## Medications

### Vancomycin

- **Classifications:** Antibiotic (Therapeutic), glycopeptides (Pharmacological) (Wilkins, 2020)
- **The reason the client is taking:** The client is taking this drug to treat infections related to *S. aureus*, penicillin-resistant pneumococci, and methicillin-resistant staphylococci (Wilkins, 2020)
- **Nursing assessments before administration:** Assess the client's WBC, BUN, and creatinine levels before administration as this drug can cause fluctuation in CBC, BUN, and creatinine (Wilkins, 2020).

### Ceftriaxone

- **Classifications:** Antibiotic (Therapeutic), 3<sup>rd</sup> generation cephalosporins (Wilkins, 2020)
- **The reason the client is taking:** The client is taking this drug to treat a potential bacterial infection such as meningitis and acute otitis media (Wilkins, 2020)
- **Nursing assessments prior administration:** Assess the client's WBC, BUN, ALT, and AST values as this drug can cause fluctuation in CBC, BUN, ALT, and AST values (Wilkins, 2020)

### Doxycycline Hyclate

- **Classifications:** Antibiotic (Therapeutic), Tetracycline (Pharmacologic) (Wilkins, 2020)
- **Reason:** The client is taking this drug to treat and further prevent bacterial infections.
- **Nursing assessments prior administration:** Assess the client's WBC, BUN, and platelets as this drug can cause fluctuation in WBC, BUN, and platelet count (Wilkins, 2020)

## Demographic Data

**Admitting diagnosis:** Meningitis (unconfirmed) **Psychosocial Developmental Stage:**

**Age of client:** 13 years old

Identity vs. Role Confusion

**Sex:** Male

**Weight in kgs:** 60.4 kg

**Cognitive Development Stage:**

**Allergies:** No known allergies

Formal Operation

**Date of admission:** 9/16/2021

## Admission History

The client was admitted onto the unit on 9/16/2021 for a fever that persisted for over seven days. The client has taken measures to treat the symptoms with acetaminophen; however, the symptoms remained. The client's family decided that it was best to turn their attention to the hospital for help.

## Pathophysiology

**Disease process:** Meningitis is a condition characterized by a bacterial or viral infection within the tissues and vessels around the brain and the spinal cord after being inhaled (Capriotti, 2020). Once someone inhales bacteria such as *Neisseria meningitidis* or *Streptococcus pneumoniae*, they quickly attach to the nasopharynx's epithelial cells, cross the mucosal barrier, and enter the bloodstream (Capriotti, 2020). The bacteria then travel to the cerebral blood vessels and cross the blood-brain barrier (Capriotti, 2020). The bacteria then infect the meninges, rapidly multiply and lyse the surrounding subarachnoid space, and release bacterial endotoxins (Capriotti, 2020). Neutrophils are attracted to the rapidly growing number of bacteria and release inflammatory cytokines to fight infection (Capriotti, 2020). The cytokines increase the permeability of the blood-brain barrier, which causes cerebral edema and damages the surrounding brain tissue (Capriotti, 2020). Eventually, blood cells seep out of the damaged tissues and blood vessels which can thicken the cerebral spinal fluid and obstruct the spinal cord and the brain (Capriotti, 2020). Intracranial pressure may increase when enough CSF causes edema in the surrounding tissues (Capriotti, 2020). Viral meningitis is caused similarly to bacterial meningitis and usually involves the virus crossing the blood-brain barriers and multiplying (Capriotti, 2020).

**S/S of disease:** Sudden high fever, headache with nausea or vomiting, confusion or difficulty concentrating, no appetite or thirst, sleepiness or difficulty waking, stiff neck, and sensitivity to light (Mayo Clinic, 2020).

**Method of Diagnosis:** Blood cultures, imaging, and spinal taps are standard diagnostic tools for meningitis (Mayo Clinic, 2020). Blood cultures involve collecting a sample of blood from the client and placing it in a petri dish. The sample goes through analysis for microorganism growth in the form of bacteria. The sample can also be placed on a slide and then stained to observe the presence of bacteria (Mayo Clinic, 2020). Computerized tomography (CT) or magnetic resonance imaging (MRI) is another form of diagnosing meningitis. These tests check for swelling or inflammation present within the tissues (Mayo Clinic, 2020). Spinal taps involve the collection and analysis of cerebrospinal fluid. A positive result for meningitis will show low sugar levels, an increased white blood cell count, and protein (Mayo Clinic, 2020).

**Treatment of disease:** Treatment will depend on the type of meningitis. Treatment for bacterial meningitis involves IV antibiotics and corticosteroids (Mayo Clinic, 2020). Vancomycin, ceftriaxone, and doxycycline hyclate have been administered to the client to kill off any potentially harmful bacteria. Unlike bacterial meningitis, antibiotics are an ineffective treatment against viral meningitis. Instead, the best form of treatment will involve giving the client plenty of bed rest, fluids, and over-the-counter pain medications to treat the symptoms of viral meningitis (Mayo Clinic, 2020).

## Relevant Lab Values/Diagnostics

- Results as of 9/16/2021
  - Elevated CRP and CSF
- Results as of 9/12/2021
  - Absolute neutrophils: 9.54 (High)
  - Absolute monocytes: 0.87 (High)

### Normal lab values

- CRP test: Less than 10 mg/L (Mayo Clinic, 2021)
- CSF test: 50-80 mg/100 mL (MedlinePlus, 2021)
- Absolute neutrophils: 1.8-7.8  $10^9$  per liter (Pagana et al., 2018)
- Absolute monocytes: 0-0.80  $10^9$  per liter (Pagana et al., 2018).

### Discussion

- Infection usually causes an abnormal CRP and CSF result. Inflammation of the central nervous system and a tumor can also cause an abnormal CRP and CSF result (Mayo Clinic, 2021). The causes are consistent with the characteristics of meningitis because bacteria or viruses can cause inflammation of the brain and the spinal cord.
- Elevated WBC counts including, absolute neutrophils, monocytes, and immature granulocytes, usually indicate an infection (Capriotti, 2020)

## Medical History

**Previous Medical History:** N/A

**Prior Hospitalizations:** N/A

**Chronic Medical Issues:** N/A

**Social needs:** N/A

## Active Orders

- **Isolation – contact/droplet** (9/16/2021 at 2130 hours)
- **Diet = regular** (9/17/2021 at 0054 hours)
- **Gastrointestinal pathogen panel** (9/16/2021 at 2332 hours)
- **Spotted fever GRP, AB, IgG, IgM** (9/16/2021 at 2332 hours)

### Discussion

- Isolation precautions are necessary because the client has an unknown infection that is potentially contagious.
- The client showed signs of improvement and started eating solid food items again. He could not eat solid food items before the clinical day.
- The client suffers from an unknown infection that causes him to experience diarrhea whenever he eats solid foods. A gastrointestinal pathogen panel will help diagnose the infection.
- The client is experiencing an unknown infection. A spotted fever lab test will help diagnose the unknown infection.

**Assessment**

General	Integument	HEENT	Cardiovascular	Respiratory	Genitourinary	Gastrointestinal	Musculoskeletal	Neurological	Most recent VS (highlight if abnormal)	Pain and Pain Scale Used
<p>The client appeared oriented to time, place, situation, and person.</p> <p>The client initially appeared to be slightly fatigued and verbally unresponsive.</p> <p>The client's hair appears to be unkempt.</p> <p>The client appeared to be livelier and more talkative after 1600 hours.</p>	<p>The client's skin is pink, dry, warm, and intact.</p> <p>Skin turgor was less than 3 seconds.</p> <p>There were no rashes, bruises, or wounds seen upon inspection.</p>	<p>The client appears to be normocephalic. His neck and head are aligned.</p> <p>The client's nose is midline and does not have drainage. The client's eyes are symmetrical and exhibited PERRLA. His teeth appeared to be intact.</p> <p>The client reported experiencing headaches yesterday afternoon and the day before in the evening. Headaches are consistent with symptoms of meningitis.</p>	<p>The client's S1 and S2 heart sounds are present. No S3 or S4 heard upon auscultation.</p> <p>The client's heartbeat was regular and consistent.</p> <p>Radial, carotid, and brachial pulses were +2 bilaterally. No edema or neck vein distention was present upon assessment.</p>	<p>Breath sounds were clear, and no abnormal sounds were present upon assessment. The client's respiratory rate was 16 respirations/min .</p>	<p>The client had no problem voiding.</p>	<p>The client is on a regular diet.</p> <p>The client states that he cannot eat solid foods for the past seven days. He states that it would cause diarrhea and nausea. He showed improvement and ate a chicken strip and a small portion of French fries with no reported problem during clinical.</p> <p>The client states that he experienced diarrhea, stomach aches, and nausea whenever he tried eating solid foods for the past three days. Nausea is consistent with the symptoms of meningitis.</p> <p>The client had active bowel sounds about 5 to 30 per minute.</p>	<p>The client demonstrated equal strength in all extremities and a full range of motion. His strength is estimated to be at a +4.</p> <p>The client's gait appeared slightly rigid and unrelaxed.</p>	<p>The client exhibited PERRLA and moved all extremities, but his gait appeared slightly rigid. He is ANO x4 and has sensory in all extremities.</p> <p>The client's foot appeared to almost trip on the other.</p>	<p><b>Time:</b> 1620 hours</p> <p><b>Temperature:</b> 97.8 F</p> <p><b>Route:</b> Oral</p> <p><b>RR:</b> 16 respirations /min</p> <p><b>HR:</b> 69 bpm</p> <p><b>BP and MAP:</b> N/A</p> <p><b>Oxygen saturation:</b> 98% on room air</p> <p><b>Oxygen needs:</b> N/A</p>	<p>The client denied pain.</p>

<p align="center"><b>Nursing Diagnosis 1</b></p> <p>Impaired nutrition related to inadequate PO intake as evidenced by the client's statement, "I haven't eaten anything in the last three days."</p>	<p align="center"><b>Nursing Diagnosis 2</b></p> <p>Risk for falls related to uncoordinated gait as evidenced by the client's rigid gait and feet almost tripping on each other.</p>	<p align="center"><b>Nursing Diagnosis 3</b></p> <p>Bathing self-care deficit related to bedridden status as evidenced by greasy hair clumped together.</p>
<p align="center"><b>Rationale</b></p> <p>The client stated that he had not eaten solid foods within the last three days. The client stated that he would experience diarrhea whenever he ate solid foods within the last three days. He states that he can eat some solid foods during the clinical shift, so he thinks things improve. The client's biggest concern is his nutrition, and he is unable to receive proper nutrition due to his condition, which can negatively affect his wellbeing and recovery.</p>	<p align="center"><b>Rationale</b></p> <p>The client can move all extremities well and with adequate strength; however, he still experiences a rigid gait with small uncoordinated steps, as evidenced by almost tripping on his foot. For the most part, the client can ambulate independently, but his small uncoordinated steps put the client at a slight risk of hurting himself and should be monitored.</p>	<p align="center"><b>Rationale</b></p> <p>The client stated that he did not get up from the bed very often because he felt weak whenever he would get up. He would stay in bed unintentionally, neglecting his showers and hygiene. The client's hair appeared to be unkempt and stuck together into clumps as a result. While his hygiene is not an emergency, it can still affect his self-image.</p>
<p align="center"><b>Interventions</b></p> <p><b>Intervention 1:</b> Keep snacks at the bedside to give to the client.</p> <p><b>Intervention 2:</b> Monitor bowel sounds once per shift</p>	<p align="center"><b>Interventions</b></p> <p><b>Intervention 1:</b> Identify factors that may cause or contribute to injury from a fall.</p> <p><b>Intervention 2:</b> Provide the client with education on slowing down and proper ambulating.</p>	<p align="center"><b>Interventions</b></p> <p><b>Intervention 1:</b> Assist the client with performing bathing and hygiene.</p> <p><b>Intervention 2:</b> Allow the client enough time to perform self-care.</p>
<p align="center"><b>Evaluation of Interventions</b></p> <p>The client was happy to see food and snacks placed on his bedstand. He ate another chicken strip and stated that he felt well with no reported abdominal pain. He has active bowel sounds of approximately 5 to 10 bowel sounds per minute. The client appeared to agree with the interventions and was satisfied with having food close within reach.</p>	<p align="center"><b>Evaluation of Interventions</b></p> <p>Upon ambulation, the client's feet occasionally step too close and almost hit each other when they came to meet as the client strides. He was quickly informed and told to slow down when he walks and watch out for his feet hitting the other as he walks. The client demonstrated understanding by stating that he would try to pay more attention to his gait.</p>	<p align="center"><b>Evaluation of Interventions</b></p> <p>The client was encouraged to take a shower as his strength returned during the clinical shift. The client decided to take a shower shortly after and reported feeling better after the shower.</p>

## References

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Mayo Clinic. (2021, June 25). *C-reactive protein test*. <https://www.mayoclinic.org/tests-procedures/c-reactive-protein-test/about/pac-20385228>

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