

Medications med math down under

- Azithromycin 80 mg in 0.9% NaCl, 40ml/hr every 24 hours. The pharmacological class is Macrolide, and the therapeutic class is an antibiotic (Jones & Bartlett, 2024). The client is taking this medication because of the wheezing and shortness of breath that the client had when admitted. The client may also take this antibiotic to diagnose other human meta pneumonia viruses or possible pneumonia. Before taking this medication, nursing assessments include an allergy to this medication and similar medications, looking at labs to see if infection persists, and observing for any other medical history (Jones & Bartlett, 2024). I have found that IV administration of this medication is not recommended for pediatric patients.

- Piperacillin-tobactam (Zosyn) 1,400 mg in 0.9% NaCl 50mL. This medication's pharmacological and therapeutic class is penicillin antibacterial and beta-lactamase inhibitors (Drugs.com, 2024). The client is taking this medication for the infection. This medication can indeed cause infection if one is from the norovirus or pneumonia. Key nursing assessments are to assess for prior allergy to this medication and if there is a risk for allergy. Also, check for any medical history that can interact with this medication, such as an electrolyte imbalance (Drugs.com, 2024).

- Valproic acid (Depakene) oral syrup, 100 mg in gastric tube. The pharmacological class for this medication is carboxylic acid derivative, and the therapeutic class is an anticonvulsant (Jones & Bartlett, 2024). The client is taking this medication because of their history of seizure disorder because of their chromosomal disorder. Key nursing assessments before administration include being cautious when using multiple anticonvulsants, if the patient is at risk for hepatotoxicity, and observing serum level liver testing before administration (Jones & Bartlett, 2024).

- 0.9% NaCl 57 mL/hr continuous. This fluid is classified as parenteral fluid and a slat as the therapeutic and pharmacological class (Jones & Bartlett, 2024). The patient is on this fluid to help rehydrate them since they were diaphoretic and vomiting. The client is also on this fluid to administer medications intravenously. Before this, key nursing assessments ensure the client is not already fluid overloaded with water and fluids.

- Clobazam (Onfi) 1mg/mL, gastric tube, 5mg. The pharmacological class for this medication is benzodiazepine, and the therapeutic class is an anticonvulsant (Jones & Bartlett, 2024). The client is taking this medication for their history of seizures, which is a poor side effect of the client's chromosomal disorder. Key assessments before the administration of this medication include assessing the patient and the physical dependence on this medication (Jones & Bartlett, 2024). Assess the patient's need for this medication and their compliance with it.

- Levocarnitine (Carnitor) oral solution, 200 mg, twice daily in gastric tube. This medication's pharmacological and therapeutic classes are nutraceutical products (Drugs.com, 2024). The patient is taking this medication as a dietary supplement of carnitine. Since this patient does not take food by mouth, this medication is to help supplement her. When administering this medication, key nursing assessments are to assess for vomiting and nausea. Since this client admitted vomiting, she must keep this medication down. This medication might be unsafe to clients who have seizures, which this patient has had (Drugs.com, 2024).

Demographic Data

Admitting diagnosis: Norovirus and Human .
metapneumovirus

Age of client: 6 years old
Sex: female
Weight in kgs: 18.7 kgs
Allergies: Zofran (ondansetron)
Date of admission: 2/2/2025

Admission History

This patient arrived at the emergency department because of vomiting and constipation for three days. The client was admitted two days prior for the same reason and then later discharged. The mother of the child stated the client had not had a bowel movement for three days and was given MiraLAX for those days to help. The mother explained the emesis looked coffee ground-like, and the client appeared in no pain. The patient has a G-tube and is nonverbal. The client was also short of breath on admission and tachypneic.

Pathophysiology

This is explained at the bottom of the document.

Disease process:

S/S of disease:

Method of Diagnosis:

Treatment of disease:

Assessment		
General	This patient was awake and in no acute distress, nonverbal , and has an obvious global/developmental delay . Parent was at bedside and the patient was very responsive to the mother. The patient had a flat affect but was giggly. She had just got up from a nap and was in a good mood with her toys around her. The child was well groomed and diaphoretic . The child attempted to make eye contact but could follow my voice commands well with the help of her parent. The patient appears their age.	
Integument	The client had some redness on her left shoulder, possibly from sleep and a bruise on her left forearm . The clients skin was warm to the touch, pale, no rash or lesions noted, no wounds, no redness, and hair was appropriate for age and gender. The skin around the clients G-tube was not irritated.	
	The client had dried sleep on her eyes, microcephalic head, and esotropia . The client had no lesions, rashes, bumps, or bruises on head or face. The client had O2 on that was toned to their face . The client was drooling a bit. PERRI A was attempted but the client	
<p>Relevant Lab Values/Diagnostics</p> <p>The respiratory pathogen panel revealed the human metapneumovirus. This diagnosis is typical for this client, who frequently has respiratory issues. This test is expected to show no respiratory pathogens in the respiratory tract.</p> <p>The urinalysis revealed ketone levels in the urine at 80mg/dL. The normal ketone level is zero, but since this client is febrile, this is present (Pagana et al., 2023).</p> <p>- Red blood cells were decreased at 3.73. The typical red blood cell count is 4-5.5 in children (Pagana et al., 2023). This is indicative of the clients' dietary deficiency and illness.</p> <p>- The client's MCH slightly increased by 31.1, and the normal is 31 (Pagana et al., 2023). This can be from underlying anemia.</p> <p>Platelets decreased to 97,000, when the normal is 150,000 – 400,000 (Pagana et al., 2023). This can be due to an acute infection or underlying anemia.</p> <p>Absolute lymphocytes were 1.07, down from the normal of 20-40 (Pagana et al., 2023). This can be due to immunodeficiency problems or possible sepsis (Pagana et al., 2023).</p> <p>- Absolute eosinophils were decreased at 0.0 and are usually 1-4 (Pagana et al., 2023). This can be from increased adrenosteroid production (Pagana et al., 2023). There is no reason I could find this was decreased.</p> <p>Absolute immature granulocytes were increased at 0.05 when the normal is less than 1% (Pagana et al., 2023). This can be due to inflammation, infection, or a bone marrow issue.</p> <p>A blood culture was performed on this patient to help identify what is expected and abnormal in the blood cells (Pagana et al., 2023). The results of this test were not posted at the time of my clinical visit.</p> <p>- A chest x-ray was done to rule out pneumonia. This client presented to the emergency room with shortness of breath. This x-ray showed an increasing left pleural effusion, atelectasis, and patchy white opacities bilaterally, which is specific for pneumonia.</p> <p>An x-ray KUB was performed on this client for constipation. This test showed improvement and decreased fecal material within the colon and rectal sigmoid colon. The client presented to the emergency room with constipation, so this was to determine whether some feces were still impacted.</p> <p>- ECG 12 lead was done because when the client was admitted and had an ECG done, it showed an abnormality, and this one was to monitor and view the heart's electrical activity, which was a normal sinus rhythm.</p>	<p style="text-align: center;">Medical History</p> <p>Previous Medical History: Acute respiratory failure, parainfluenza infection, parainfluenza virus infection, seizure disorder, pneumonia, rhinovirus, RSV bronchiolitis, tracheoesophageal fistula, right foot fracture, and tetrasomy 18 p.</p> <p>Prior Hospitalizations: Pneumonia on 10/21 and 11/21, RSV bronchiolitis (10/22), acute respiratory failure (10/22), and many more prior hospitalizations, but no reason stated or date given.</p> <p>Past Surgical History: Thoracotomy right (2/5/19), bronchoscopy (3/19), eye surgery (5/20), and gastrostomy (7/22).</p> <p>Social needs: This child is in trust vs. mistrust since they rely on a caregiver and seem to have developmental delays. If we look at their age, they are in industry vs. inferiority. This client relies on the caregiver to live and perform daily activities.</p>	<p style="text-align: center;">Active Orders</p> <p>Isolation precautions include droplet/contact since this client has norovirus. A respiratory pathogen panel rules out or diagnoses a respiratory disease. SARS-COV-2/flu/RSV, Rapid PCR is to rule out another respiratory disease. Glucose – to test their sugar. ECG 12 leads to monitor their heart and ruling out any abnormalities. Diet regular – to let the nurses know to keep giving her the regular tube feedings. Pediatric feeding pattern – G-tube; home feeds – to let the care team know to continue the same feeds she gets at home. Enteral nutrition – this child has a G-tube, and this is how they get their nutrition. This is to let the healthcare team know this. Occult blood and pH, gastric aspirate – this was because of the emesis on admission to rule out anything major. Blood pressure is checked every eight hours while awake – this is done to monitor the client's health status frequently. IV access – This is appropriate in their care to make sure they get the fluids and medications needed to get healthier. Neonatal/pediatric airway status – This is important in case the client is not breathing well on her own and needs a clear airway to intubate. Notify the physician for elevated temperature, pulse, respiration, and blood pressure – this is important in case of an emergency, and the physician can step in and make decisions on the plan of care. Pulse ox to keep O2 at 92% - this is important to monitor to ensure she has good oxygen in her body since she is having trouble breathing and monitoring that frequently is important in ensuring the correct plan of care. It is also important to prevent lack of oxygen to the tissues and organs. Seizure precautions – this is important since this client has a history of seizures and is on some anticonvulsants. Attempt CPR/full treatment order is important to know in case of an emergency and the health care team knows their limits. I&O is important since this client was vomiting and constipated. Vitals every 4 hours is important to monitor the clients health status.</p>
(highlight if abnormal)	<p>RR: 42 breaths per minute.</p> <p>HR: 112 beats per minute.</p> <p>BP and MAP: 103/67 mm/Hg and 81</p> <p>Oxygen saturation: 97%</p> <p>Oxygen needs: patient was on 3L of oxygen per nasal cannula.</p>	
Pain and Pain Scale Used	The patient appeared in no pain and the FLACC scale score of 0 (Rudd & Kocisko, 2022).	

Nursing Diagnosis 1	Nursing Diagnosis 2	Nursing Diagnosis 3
Deficient fluid volume related to excessive fluid loss as evidenced by vomiting and constipation (Phelps, 2023).	Imbalanced nutrition related to gastric tube feeds as evidenced by low body weight for age (Phelps, 2023).	Risk for infection related to the clients g-tube (Phelps, 2023).
Rationale	Rationale	Rationale
I picked this diagnosis because the client was	This nursing diagnosis was picked because the	I picked this diagnosis since this a young child

<p>losing fluid and becoming dehydration. This client had IV fluids running to help with the dehydration and inadequate fluid intake.</p>	<p>client had visible undernourished look to her. She has a tracheoesophageal fistula history and cannot take food by mouth, so she eats through a feeding tube, leading to her being undernourished. This way to intake, can lead to many different diagnoses.</p>	<p>with a g-tube that can put it at higher risk for becoming infected. It is important the family and caregivers know the signs of infection as well.</p>
<p style="text-align: center;">Interventions</p> <p>Intervention 1: monitor and record vitals every 2 hours to help indicate if there is a fluid volume deficit or electrolyte imbalance (Phelps, 2023). Intervention 2: monitor input and output to monitor significant fluid loss or gain through urine, stool, and vomit (Phelps, 2023).</p>	<p style="text-align: center;">Interventions</p> <p>Intervention 1: Provide a diet that can be specific to the patient’s condition to help improve the nutritional status (Phelps, 2023). Intervention 2: Keep record of all outputs and electrolytes that can lead to nutritional imbalances (Phelps, 2023).</p>	<p style="text-align: center;">Interventions</p> <p>Intervention 1: Minimize infection risk by performing hand hygiene when dealing with the g-tube (Phelps, 2023). Intervention 2: Keep the area clean and dry (Phelps, 2023).</p>
<p style="text-align: center;">Evaluation of Interventions</p> <p>The interventions were helpful in the regaining of fluid in the client. The client was able to retain fluid with interventions in place and monitoring it was helpful in rehydrating the patient. The caregiver and health care team were responsive to these interventions put in place. I was able to observe the client receiving adequate fluid.</p>	<p style="text-align: center;">Evaluation of Interventions</p> <p>The first intervention can be done once the client is not hospitalized so it can be a more efficient routine. Maybe the family can consult with a dietitian so the client can start a new diet that can help with nutrition. The second intervention can help in aiding in observing nutritional status and nutritional absorption so they health care team can plan accordingly. Monitoring output and electrolytes can help aid in preventing dehydration as well. These interventions are well received.</p>	<p style="text-align: center;">Evaluation of Interventions</p> <p>This first intervention is important in preventing infection since the most common way to spread pathogens is unwashed hands. Keeping this area clean and dry is important in keeping the bacteria from building up and growing there. The caregivers and health care team are taking these interventions seriously since there was no sign of infection on this child’s g-tube.</p>

		What do you expect?	What did you observe?
Erickson’s Psychosocial Developmental Stage	Trust vs mistrust (Rudd & Kocisko, 2022).	It is expected this child learns to trust the caregiver and trust in the world (Rudd & Kocisko, 2022).	This client is age 6, but they are developmentally 1. This client relies on a caregiver for daily tasks and to live. She has a chromosomal disorder, tetrasomy 18p, that causes a global delay and a developmental delay. This client is nonverbal and can not walk.
Piaget’s Cognitive Developmental Stage	Sensorimotor stage (Rudd & Kocisko, 2022).	It is expected this child will have reflexes, be able to do repeated actions, learn objects and symbols, and use trial and error (Rudd & Kocisko, 2022).	This child is age 6, but they are in the sensorimotor stage since they are stuck in the motor and reflex actions. This client relies on her caregiver to live and perform activity of daily living. She has a global delay from her chromosomal disorder of tetrasomy 18p. This child gets agitated when their objects are not in sight such as her toy and tablet. This child cannot walk but can move extremities.
Age-Appropriate Growth & Development Milestones	<ol style="list-style-type: none"> 1. gain 3-5 pounds a year (Rudd & Kocisko, 2022). 2. grow 1.5-2.5 inches a year (Rudd & Kocisko, 2022). 3. move to a regular car set with a regular seat belt (Rudd & Kocisko, 2022). 		
Age-Appropriate Diversional Activities	<ol style="list-style-type: none"> 1. using a stuffed animal during an assessment 2. use of a tablet 3. using peek-a-boo when doing an assessment to be able to observe and inspect the clients body 		

Pathophysiology:

Disease process:

Norovirus is a common cause of acute gastrointestinal disorders worldwide (Capece & Gignac, 2023). In affluent countries with rotavirus vaccination systems, it is more common than rotavirus and causes pediatric gastroenteritis. It has been challenging to anticipate how norovirus infects and replicates in people. All age groups are susceptible to norovirus infection, but the elderly and those with impaired immune systems are most at risk for adverse consequences. According to studies, norovirus infection is multifaceted, involving several cell types in the human stomach. The primary cell type lining the human gut is an enterocyte, a single layer of intestinal epithelial cells. Many immune cells exist deep inside the enterocytes. The norovirus infects and grows in immune cells such as B, dendritic, and macrophages, per several studies. Among the suggested entry routes are lymphoid follicles and M cells, a particular gut cell covering the Peyer patches. The norovirus may more easily enter the host and infiltrate immune cells because M cells do not have microvilli and do not release mucus. It typically takes one to two days after viral invasion for clinical symptoms to appear, and norovirus symptoms usually go away in one to three days. Humans can have the virus in their feces for a long time, often up to 60 days, even though symptoms may go away. For months or years, immunocompromised patients may continue to spread the infection.

Signs and symptoms of disease:

Individuals infected with norovirus usually exhibit signs associated with gastroenteritis (Capece & Gignac, 2023). Frequent symptoms encompass nausea, vomiting, abdominal discomfort and cramping, diarrhea, muscle aches, headache, and chills. Some individuals may experience more diarrhea, while others may have nausea and vomiting as their primary symptoms. These symptoms can appear with or without an initial warning period and generally last one to three days. Individuals may exhibit indications of dehydration, including rapid heart rate, low blood pressure upon standing, reduced skin elasticity, and dry oral membranes, which relate to their hydration level. More serious neurological symptoms like seizures or encephalopathy may occur in some cases. Depending on their hydration level, patients may exhibit symptoms such as dry mucous

membranes, orthostatic hypotension, tachycardia, and reduced skin turgor. On rare occasions, patients may have severe neurologic symptoms like encephalopathy or seizures. My client presented to the emergency department with vomiting for three days and constipation not relieved by an osmotic laxative.

Method of diagnosis:

Many norovirus infections remain undiagnosed because many individuals do not consult a healthcare professional for treatment (Capece & Gignac, 2023). For those who do seek medical evaluation, the diagnostic process usually resembles that of other gastroenteritis cases. Typically, diagnostic tests are not necessary. However, a metabolic panel might be recommended for some patients to evaluate electrolyte imbalances and hydration levels. When norovirus is suspected, doctors can use enzyme immunoassays and RT-PCR tests to detect it. These tests are typically unnecessary for individual cases but can help identify outbreaks. Enzyme immunoassays are more commonly available, but RT-PCR is the best method for detecting norovirus. Both tests use stool or vomit samples to find GI and GII noroviruses. My patient was diagnosed with clinical symptoms and a gastrointestinal panel, which identified norovirus.

Treatment of disease:

Managing a norovirus infection involves two main goals: preventing the spread of the virus and treating symptoms (Capece & Gignac, 2023). The top priority is keeping the patient hydrated to protect them and others. Oral rehydration is key, but if dehydration is severe or if the patient is vomiting a lot, intravenous hydration or hospitalization may be needed. Generally, antibiotics should only be used if a bacterial infection is suspected. Creating a norovirus vaccine is important for public health and economic reasons. However, it is challenging due to the complex nature of the virus, how the human immune system responds, difficulties in cultivating the virus, and the lack of animal models for testing. My client was treated with antibiotics, intravenous fluids, and rest.

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Med math:

- Azithromycin: 10mg/kg/dose once daily. $10 \text{ mg} \times 18.7 = 87 \text{ mg}$ once a day. This client is given 80 mg in 24 hours. This medication is safe.
- Piperacillin-tazobactam 300mg/kg/dose. $300 \text{ mg} \times 18.7 = 5,610 \text{ mg/dose}$. This client is given 1400 mg of this medication daily in normal saline. This is a safe amount.
- Valproic acid is not recommended for clients younger than 10. The recommended therapeutic level is 10-15 mg/kg/day. $10 \times 18.7\text{kg} = 187 \text{ mg a day}$. $15 \times 18.7\text{kg} = 280.5 \text{ mg a day}$. This client receives 100 mg of this medication daily. Although this medication is below the recommended therapeutic level, it is safe. This may be because the patient is so young.
- Clobazam is measured as anyone less than 30 kg receiving 5 mg once a day; the max is 20 mg a day. This client receives 5 mg daily, which is safe for this client. No medical math is required for this dose.
- Levocarnitine initial dose is 50 mg/kg/day orally in evenly divided doses, and the max is 3 grams daily. The client is not receiving 3 grams daily; they are receiving 400 mg daily. $50 \text{ mg} \times 18.7 \text{ kg/day}$ is 935 mg a day. This patient is taking a safe amount of this medication.