

**Medications**

**Acetaminophen (Tylenol)- 115.2 mg (3.6mL) liquid given via g-tube every 4 hours as needed**  
**Pharmacological class:** Nonsalicylate, para-aminophenol derivative (Jones & Bartlett Learning, 2023)  
**Therapeutic class:** Antipyretic, non-opioid analgesic (Jones & Bartlett Learning, 2023)  
**Is this dose safe:** This medication was ordered 15mg/kg x his weight of 7.77kg for a dose of 115.2mg with available liquid medication at 160mg/5mL so that mL given per dose was 3.6mL. According to research, children ages 2-3 who weigh 10.9-15.9kg can receive 160mg of acetaminophen every 4 hours with a max of 800mg. However, this 3-year-old patient only weighs 7.8kg and a safe dosage is listed as 80mg every 4 hours for children weighing 5-8kg. Therefore, **this dose may be UNSAFE for this patient.**  
**Reason for taking:** This is prescribed PRN to address mild pain or to bring down a fever if the patient spikes a temperature of 100.4°F or greater.  
**Key nursing assessments:** Clarify with the physician whether or not this dose is safe for this patient given his weight. Monitor liver labs (Jones & Bartlett Learning, 2023).

**5% Dextrose & 0.9% Normal Saline Solution- given at a rate of 30mL per hour via IV continuous infusion**  
**Pharmacological class:** Electrolytes (National Institutes of Health, 2019)  
**Therapeutic class:** Parenteral fluid, nutrient and electrolyte replenisher (National Institutes of Health, 2019)  
**Is this dose safe:** Yes, a rate of 30mL per hour IV continuous infusion is safe for this patient.  
**Reason for taking:** This patient is currently NPO and also not receiving any tube feedings, so this medication is being used to provide the patient with hydration, electrolytes, and a source of nutrition, until he is able to begin feedings again (National Institutes of Health, 2019).  
**Key nursing assessments:** Monitor the IV site for patency, redness, warmth, swelling, and/or possible infiltration or extravasation. Auscultate lungs sounds frequently to assess for fluid overload. Monitor for hyper and hypoglycemia (National Institutes of Health, 2019).

**Metronidazole (Flagyl)- 103mg; 20.6mL/hr given via IV infusion over 1 hour every 8 hours**  
**Pharmacological class:** Nitroimidazole (Jones & Bartlett Learning, 2023)  
**Therapeutic class:** Antiprotozoal (Jones & Bartlett Learning, 2023)  
**Is this dose safe:** Yes, this dose is safe but may be **a little high.** A safe dose is considered 30 mg/kg/day divided into 4 doses a day, making sure not to exceed 4g a day (Jones & Bartlett Learning, 2023). This patient weighs 7.8kg and therefore should get 234 mg a day with 78mg given every 8 hours. He is currently getting 309mg total a day, which is higher than the recommended 30mg/kg/day, but lower than the 4g maximum.  
**Reason for taking:** This patient came to the ED with complaints of constipation related to Hirschsprung's disease which means that stool was sitting stagnant in his colon for a couple of days. Stagnant stool contains a lot of bacteria that can cause infection so this is being taken to combat any bacterial infections caused by the stagnant stool (Jones & Bartlett Learning, 2023).  
**Key nursing assessments:** This medication can cause several severe adverse reactions such as encephalopathy, hypotension, seizures, malaise, skin rashes, and constipation or diarrhea (Jones & Bartlett Learning, 2023). Therefore, frequent vital signs, skin assessments, and neurological assessments should be done before administering this medication to assess for changes in patient condition. Also, given this patient's developmental status, the nurse should watch closely for non-verbal signs of pain that could indicate adverse reactions.

**Demographic Data**

**Age of client:** 3 years old  
**Sex:** Male  
**Weight in kgs:** 7.8 kg  
**Allergies:** No known allergies  
**Date of admission:** 9/26/2024

**Admission History**

This patient was admitted to the ED on 9/26/24 accompanied by his mother with complaints of constipation that began on 9/25/24 with the patient's last bowel movement being 9/24/24. This patient has a history of Hirschsprung's disease and therefore receives feedings via a g-tube. The patient's mother stated that he was no longer able to tolerate his tube feedings and would vomit after 10 minutes of the feedings. His mother noted that his abdomen was also extremely distended. The patient had been receiving anal botox injections with the last one being 8/24/24, to help address similar episodes as this and mother stated that he had initially responded well to this treatment. Upon arrival to the ED, a rectal irrigation was performed and 1,200mL of stool was removed, but the patient's abdomen remained distended. It was determined that the patient should be admitted and remain NPO with rectal irrigations performed three times a day until this episode can be resolved.

**Pathophysiology**

**Disease process:** This patient was admitted to the hospital for constipation related to Hirschsprung's disease. Another name for this condition is congenital aganglionic megacolon (Boston Children's Hospital, 2024). It is a condition that people are born with where the nerve cells, called ganglions, in the lower portion of their colon do not develop properly (Boston Children's Hospital, 2024). This makes it so the colon cannot properly communicate with the body's nervous system so this delays the progression and expulsion of stool which leads to chronic constipation (Boston Children's Hospital, 2024). The underlying cause of this condition is not completely known, but it is thought that genetic factors may be involved (Boston Children's Hospital, 2024). This patient also has L1 Syndrome which is an X-linked recessive disorder that almost exclusively affects males and causes dysfunction in the nervous system creating many problems such as intellectual disability, hydrocephaly, and muscle problems (U.S. National Library of Medicine, 2021). Therefore, his Hirschsprung's disease may also have a relationship with the L1 syndrome.

**S/S of disease:** 80% of kids affected with Hirschsprung's disease start having symptoms within their first six weeks of life (Boston Children's Hospital, 2024). The primary symptom of the condition is constipation and failure to have regular bowel movements (Boston Children's Hospital, 2024). Other signs and symptoms include abdominal distension, vomiting, lack of appetite, fever, delayed growth, and passing only small amounts of watery stool (Boston Children's Hospital, 2024). This patient was diagnosed very early in life with this condition and struggles with chronic constipation. He presented to the ED with classic signs of constipation, severe abdominal distension, and vomiting.

**Method of Diagnosis:** Most often this disease is diagnosed in newborns and doctors will perform an abdominal x-ray to view the colon, a contrast enema to provide a clearer visual of the large intestine for abnormalities, and a rectal biopsy that can be examined for the presence or absence of ganglion cells (Boston Children's Hospital, 2024). It is unclear how exactly this patient was diagnosed, but due to the severity of his disease it is likely he had all three of these procedures performed when he was an infant.

**Treatment of disease:** The two most common treatments for this disease are either a "pull through" surgery where the diseased portion of the colon is removed and the healthy part is attached to the rectum to help promote normal bowel movements (Boston Children's Hospital, 2024). Or, an ostomy can be done, where again the diseased portion of the colon is removed but the healthy portion is then attached to the abdomen so that stool can leave the body via a stoma (Boston Children's Hospital, 2024). This patient had a pull through surgery performed when he was 6 months old. He is also receiving anal botox injections that are intended to help control bowel movements as well. This patient also has a g-tube but this is likely in place due to his dysphagia from L1 syndrome.

**Relevant Lab Values/Diagnostics**

**CT of brain w/o contrast:** A CT scan can take detailed images of the body's tissues. This patient's CT of the brain was found to be unremarkable showing no complications of hydrocephaly in the brain related to his L1 syndrome.

**X-ray of shunt:** An x-ray was performed to assess this patient's ventriculoperitoneal shunt and was also found to be unremarkable with no complications.

**WBC Count (normal range: 5,000-1000  $mm^3$ ): 11,690  $mm^3$**  This patient's WBC count was elevated. Elevations in WBC can occur due to infection, stress, inflammation, and dehydration (Pagana et al., 2023). This patient is currently under stress due to his hospitalization and is getting a surgery consult for possible infection of his colon which would also lead to inflammation and therefore an overall increase in WBC count.

**Absolute Monocytes (normal range: 100-700  $mm^3$ ): 1,210  $mm^3$**  Acute infections and inflammatory disorders can cause increases in monocytes (Pagana et al., 2023). Due to the stool that was sitting stagnant in his colon, he likely has an infection causes the increase in his monocytes.

**Absolute Eosinophils (normal range: 50-500  $mm^3$ ): 960  $mm^3$**  Increases in eosinophils is typically due to allergic reactions, however inflammation and infection can also cause this value to increase (Pagana et al., 2023). Therefore, inflammation in this patient's colon due to a possible infection is likely causing this increase.

**Total Protein (normal range: 6.2-8.0 g/dL): 9.0 g/dL** This lab value is a combination of prealbumin, albumin, and

**Medical History**

**Previous Medical History:** Hirschsprung's disease, L1 syndrome, global developmental delay, dysphagia, and hydrocephalus

**Prior Hospitalizations:** Aside from the 10/2021 date given for his Swenson pull through surgery, no dates are given for his previous hospitalizations, but he has been hospitalized several times before for a g-tube placement, ventriculoperitoneal shunt placement, and an abdominal adhesion surgery.

**Past Surgical History:** This patient primarily receives care at Lurie Hospital and had a laparoscopic Swenson pull through done 10/2021, has had a g-tube placement, a ventriculoperitoneal shunt placed, abdominal adhesion surgery, and a circumcision. Aside from the Swenson pull through, no dates were noted.

**Social needs:** This patient requires complex medical care due to his Hirschsprung's disease and L1 syndrome and therefore will require care from a skilled interdisciplinary team such as physical, occupational, and speech therapy to help him attain the highest level of motor skill and cognitive functioning as possible. His parents would also benefit from respite care due and counseling due to the prognosis of his condition.

**Active Orders**

**-NPO:** This patient must remain nothing by mouth until his abdomen decompresses and becomes less distended. If he were to continue his tube feedings it could result in vomiting, a bowel obstruction or even bowel perforation.

**-Q4H Vital Signs:** It is important to take routine vital signs as this patient could become unstable very quickly so trending his vitals every few hours is crucial for patient care.

**-Q4H Abdominal Exams:** Constipation and abdominal distention were this patient's admitting diagnosis so it is important to routinely assess his abdomen to see if his condition is improving or worsening.

**-Rectal Irrigations TID:** Rectal irrigations help to clean out the sigmoid colon by flushing any stool that may be present there. Stool that stays stagnant in the colon can cause severe infections such as enterocolitis so frequent irrigations can help keep the colon clean.

**-Measure Intake & Output:** This patient is NPO, but receiving continuous IV fluids so it is important to track his intake and output to ensure his kidneys are still functioning well and producing urine and the nurses should be vigilant for any bowel movements he may have on his own.

**-Maintain IV Access:** Because this patient is NPO he is receiving continuous IV fluids to help maintain his body's fluid balance therefore a patent IV line is crucial for maintaining his health and preventing further deterioration due to dehydration.

<p><b>Cardiovascular</b></p>	<p>There were clear S1 and S2 sounds without murmurs, gallops, or rubs and an overall regular rate and rhythm. The apical pulse was palpable at the 5<sup>th</sup> intercostal space, left mid clavicular line. Pulses were 2+ bilaterally at the radial and dorsalis pedis sites. Capillary refill was less than 3 seconds bilaterally on both fingers and toes. No edema was present in any extremities.</p>
<p><b>Respiratory</b></p>	<p>This patient had a normal rate and pattern of respirations and did not appear to be in any respiratory distress. Lung sounds were clear bilaterally both anteriorly and posteriorly with no crackles or rhonchi, though the lower lobes were slightly diminished, this is likely due to his hypotonia and lack of ability to move himself around well. This patient was on room air.</p>
<p><b>Genitourinary</b></p>	<p>This patient's genitourinary system was within defined limits. He utilized diapers and had 88mL of urine during the 6-hour shift. Urine was clear and yellow. Perineum was clean.</p>
<p><b>Gastrointestinal</b></p>	<p>The abdomen was generally soft, but some mild distension was noted upon palpation. This patient has a g-tube in place in the lower right abdomen due to dysphagia related to L1 syndrome. Bowel sounds were hypoactive in all four quadrants related to NPO status. The patient was NPO with no g-tube feedings due to his unresolved constipation and abdominal distension. He has a history of chronic constipation due to</p>

	Hirschsprung’s disease. He is currently on continuous IV fluids for nutrition. Rectal irrigations are being performed three times a day with the most recent irrigation at 13:30 removing 65mL of watery stool.
<b>Musculoskeletal</b>	All extremities have full range of motion, but the patient is only able to perform some purposeful movements of his extremities. The patient was unable to respond to verbal commands and demonstrated equal strength of both upper and lower extremities, but only at a 2/5. The patient is currently unable to walk and it is unclear if this is his baseline or if he has had any ability to walk at home. In general, this patient had an overall low muscle tone and impaired mobility. His thumbs were also adducted bilaterally which is a typical sign of L1 syndrome.
<b>Neurological</b>	The patient was alert, but not oriented to self, time, place, or situation. PERRLA was intact, but he often displayed rapid eye movement. There is a problem with the glossopharyngeal cranial nerve as the patient displays almost constant tongue movement and has difficulty swallowing. This patient also has a history of hydrocephaly. There is a severe global developmental delay due to L1 syndrome. This patient does not have speech, but coos and babbles.
<b>Most recent VS (highlight if abnormal)</b>	<p><b>Time:</b> 16:42</p> <p><b>Temperature:</b> 97.9°F</p> <p><b>Route:</b> Axillary</p> <p><b>RR:</b> 23 bmp</p> <p><b>HR:</b> 110 bmp</p> <p><b>BP:</b> 94/58 taken at 0900</p> <p><b>Oxygen saturation:</b> 96% on room air</p> <p><b>Oxygen needs:</b> none</p>
<b>Pain and Pain Scale Used</b>	Pain level was 1 out of 10 according to the FLACC pain scale due to an occasional whimper.

<b>Nursing Diagnosis 1</b>	<b>Nursing Diagnosis 2</b>	<b>Nursing Diagnosis 3</b>
Constipation related to the nervous system condition, Hirschsprung’s disease, as evidenced by not passing stool for two days, severe abdominal distension, and vomiting with tube feedings.  <p style="text-align: right;">(Phelps, 2023)</p>	Risk for imbalanced nutrition related to dysphagia and reliance on g-tube feedings as evidenced by low weight for age.  <p style="text-align: right;">(Phelps, 2023)</p>	Risk for impaired skin integrity related hypotonia and to the use of a g-tube as evidenced by the patient being unable to move his extremities well or provide hygiene care for himself.  <p style="text-align: right;">(Phelps, 2023)</p>
<b>Rationale</b>	<b>Rationale</b>	<b>Rationale</b>

<p>This nursing diagnosis was chosen and prioritized first because this patient struggles with chronic constipation due to a lack of nerve cells in his colon because of Hirschsprung’s disease. This chronic constipation puts him at a great risk for bowel obstructions and life-threatening infections due to stagnant stool in the colon. Constipation is something that will have to be constantly monitored for this patient for the entirety of this life.</p>	<p>This nursing diagnosis was chosen and prioritized second because due to this child’s complex medical history and the need of a g-tube for most of his feedings, he is at a great risk for not getting the right number of calories and nutrients that he needs. The type and amount of g-tube feedings that this patient gets must be closely monitored and frequently adjusted based off of his condition. A lack of proper nutrition can greatly affect his growth and development, which is already severely being affected due to his L1 syndrome.</p>	<p>This nursing diagnosis was chosen because having a g-tube in place puts this patient at risk for having his skin become irritated around the site of the g-tube insertion. He is also at risk for pressure injuries because of his low muscle tone and inability to change his positions well. This means that he relies entirely on his caregivers to move and turn him throughout the day and to provide good skin care at the site of his g-tube.</p>
<p style="text-align: center;"><b>Interventions</b></p> <p><b>Intervention 1:</b> Perform frequent abdominal assessment and rectal irrigations as needed.</p> <p><b>Intervention 2:</b> Monitor intake and output and provide adequate hydration to help with the elimination of stool (Phelps, 2023).</p>	<p style="text-align: center;"><b>Interventions</b></p> <p><b>Intervention 1:</b> Ensure that continuous IV fluids are being infused at the correct rate and dose and closely monitor blood glucose and electrolyte levels for signs of imbalance.</p> <p><b>Intervention 2:</b> Obtain daily weights of the patient to assess for any weight loss that may be due to poor nutrition (Phelps, 2023).</p>	<p style="text-align: center;"><b>Interventions</b></p> <p><b>Intervention 1:</b> Turn and move the patient at least every 2 hours to prevent skin breakdown (Phelps, 2023).</p> <p><b>Intervention 2:</b> Provide daily baths for the patient and perform frequent assessments of the g-tube site (Phelps, 2023).</p>
<p style="text-align: center;"><b>Evaluation of Interventions</b></p> <p>This patient tolerated the nursing interventions well. He was calm and cooperative with rectal irrigations and palpating of the stomach, but he did exhibit some discomfort by whimpering during the intervention. He is on continuous IV fluids and has been good about leaving his IV site alone.</p>	<p style="text-align: center;"><b>Evaluation of Interventions</b></p> <p>The patient tolerated these interventions well. He was NPO due to his unresolved constipation and had to get nutrition via continuous IV infusion of D5 with normal saline. He was tolerant of the nurse inspecting his IV site and was good about leaving it be while it ran. The patient was not weighed during the 6 hour shift, but he was calm and cooperative with all other assessments and likely would have been just as compliant with being weighed as well.</p>	<p style="text-align: center;"><b>Evaluation of Interventions</b></p> <p>The patient tolerated these interventions well and did not mind being moved around by the nurse. He also did not fuss when she assessed his g-tube and he did not mess with or pull on the g-tube during the shift.</p>

		<b>What do you expect?</b>	<b>What did you observe?</b>
<b>Erickson’s Psychosocial Developmental Stage</b>	<p><b>Autonomy vs. Shame and Doubt</b></p> <p>(Rudd &amp; Kocisko, 2023)</p>	<p>At this stage a child develops a sense of control over their body and actions and will try to do many tasks by themselves (Rudd &amp; Kocisko, 2023). They will be learning skills like potty training, how to dress themselves, and picking which toys they want to play with (Rudd &amp; Kocisko, 2023).</p>	<p>Based on observation, this child is in the infancy stage of development known as “Trust vs. Mistrust”. This child has a global developmental delay that affects him both physically and mentally. He depends fully on his caregivers to take care of all of his needs. Due to his hypotonia, he displays the gross motor skills of a young infant instead of a toddler. He is not able to walk independently but can lift up his head and look around. He has some control over the movements of his limbs, but it appears he is still learning to move them purposefully.</p>
<b>Piaget’s Cognitive Developmental Stage</b>	<p><b>Preoperational</b></p> <p>(Rudd &amp; Kocisko, 2023)</p>	<p>At this stage children use symbolic thinking and have very vivid imaginations with magical thinking (Rudd &amp; Kocisko, 2023). They have a very egocentric point of view and are unable to think abstractly (Rudd &amp; Kocisko, 2023). They enjoy pretend play and are continuing to develop and hone in on their language skills (Rudd &amp; Kocisko, 2023).</p>	<p>Again, because of this patient’s global developmental delay and severe intellectual ability he appeared behind the preoperational stage and was more at the sensorimotor stage. He was able to coo and babble, but did not use true language to communicate. It appears he is still learning to coordinate his motor responses and he displays little curiosity about the things around him. It is unknown what his IQ level is, but due to his L1 syndrome he may not be able to progress through Piaget’s stages.</p>
<b>Age-Appropriate Growth &amp; Development Milestones</b>	<ol style="list-style-type: none"> <li>1. Can mostly dress and undress self</li> <li>2. Walks up and down stairs independently</li> <li>3. Can tell you their first name when asked</li> </ol> <p>(Rudd &amp; Kocisko, 2023)</p>		
<b>Age-Appropriate Diversional Activities</b>	<ol style="list-style-type: none"> <li>1. Scribbling with crayons</li> <li>2. Playing pretend with stuffed animals</li> <li>3. Watching favorite cartoons or movies</li> </ol> <p>(Rudd &amp; Kocisko, 2023)</p>		

**References (3):**

Boston Children's Hospital. (2024). *Hirschsprung's disease*. Boston Children's Hospital. <https://www.childrenshospital.org/conditions/hirschsprungs-disease>

Jones & Bartlett Learning. (2023). *Nurse's drug handbook*. (23rd ed.). Jones & Bartlett Learning.

National Institutes of Health. (2019). *Dextrose and sodium chloride injection, solution*. U.S. National Library of Medicine.

<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=dcbf1907-1841-4afc-ab5d-a9893a2d7256>

Pagana, K. D., Pagana, T. J., & Pagana, T. N. (2023). *Mosby's Diagnostic and Laboratory Test Reference* (16th ed.). Elsevier.

Phelps, L. L. (2023). *Nursing diagnosis reference manual* (12th ed.). Wolters Kluwer.

Rudd, K., & Kocisko, D. M. (2023). *Davis Advantage for pediatric nursing: Critical Components of Nursing* (3rd ed.). F.A. Davis Company.

U.S. National Library of Medicine. (2021). *L1 syndrome*. MedlinePlus. <https://medlineplus.gov/genetics/condition/l1-syndrome/>