Medications

Ketorolac; 15 mg IV push Q6hr – to provide short-term moderate/severe acute pain (Jones & Bartlett, 2023)

- Pharm: NSAID
- Therapeutic: analgesic
- Key nursing assessment: need to monitor liver enzymes, if levels increase, expect for provider to stop the med to prevent hepatic impairment (Jones & Bartlett, 2023)

Morphine; 4mg/mL IV push Q3hr - to relieve pain severe enough to require opioid treatment (Jones & Bartlett, 2023)

- Pharm: opioid
- Therapeutic: opioid analgesic
- Controlled substance schedule: II
- Key nursing assessment: pt. vitals need to be monitored before administration. Can cause respiratory suppression or heart rate can decrease.

IV fluids; D5 0.9% NaCl 64mL/hr – to keep patient hydrated and electrolyte levels within normal levels, prevents hyperacidity (Jones & Bartlett, 2023)

- Pharm: electrolyte
- Therapeutic: antacid, electrolyte replenisher, systemic and urinary electrolyte
- Key nursing assessment: monitor for fluid volume overload and adjust hydration for individual need.

Folic acid: 1 mg oral daily – will help the pt. produce new red blood cells and reduce anemia symptoms (Jones & Bartlett, 2023)

- Pharm class: vitamin
- Therapeutic: supplement
- Key nursing assessment: frequent labs to assess for pt. folate status (Jones & Bartlett, 2023)

Hydroxyurea; 1,500 mg oral daily - help to reduce pain episodes and the need for blood transfusions (Jones & Bartlett, 2023)

- Pharm/therapeutic class: antimetabolites
- Key nursing assessment: can weaken immune system, educate pt. on staying away from people, along with sickness symptoms.

Demographic Data

Admitting diagnosis: sickle cell pain crisis/headache

Age of client: 15 yr old.

Sex: Female

Weight in kgs: 46.2 kg

Allergies: NKA

Date of admission: 10/02/2024

Admission History

Pathophysiology

Disease process: Sickle cell disease is a genetic disorder that results from the presence of a mutated form of hemoglobin and hemoglobin S (HbS) (Maakaron, 2023). During the first 6 months of life, infants are protected by elevated levels of fetal hemoglobin (Maakaron, 2023). Sickle cell disease can cause significant morbidity and mortality, particularly in African and Mediterranean history (Maakaron, 2023). This patient is African American, so she was more at risk to be diagnosed with this disease. The morbidity, frequency of pain, degree of anemia, and organ involvement can vary from individual to individual (Maakaron, 2023).

S/S of disease: Screening for sickle cell disease (SCD) at birth is now mandated in the United States. The signs and symptoms that could occur with this disease typically do not start manifesting until early childhood (Maakaron, 2023). The most common clinical manifestation of SCD is acute and chronic pain/pain crisis (which is why this patient was admitted) (Maakaron, 2023). Bone pain in the long bone extremities is another common sign/symptom of sickle cell (Maakaron, 2023). Anemia, aplastic crisis, splenic sequestration, infection, hand-foot syndrome, and pulmonary hypertension are other common manifestations that could be seen with this disease (Maakaron, 2023). Once the patient has had sickle cell disease for a longer period, patients could experience growth retardation, delayed sexual maturation and being underweight (Maakaron, 2023).

Method of Diagnosis: Diagnostic testing first starts with the mandatory HbS screening. Labs that are used in patients with SCD are hemoglobin electrophoresis, CBC with differential, serum electrolytes, peripheral blood smear, pulmonary function tests, kidney function, blood cultures, and ABGs (Maakaron, 2023). A chest x-ray should also be performed in patients that are experiencing respiratory symptom (Maakaron, 2023). MRI could also be useful for detection of bone marrow changes (Maakaron, 2023). To rule out cholecystitis, cholelithiasis, ectopic pregnancy, and to measure spleen and liver size, an abdominal ultrasound will be ordered (Maakaron, 2023). If the patient is also showing signs of pulmonary hypertension, then the nurse should expect an order for an echocardiography to identify this cause (Maakaron, 2023).

Treatment of disease: The goal of treatment for sickle cell disease is to control and manage symptoms. This can be done either by pharmacotherapy or non-pharmacologically. Some pharmacotherapy options could be administering antimetabolites to prevent hydroxyurea, give nonsteroidal analgesic meds, opioid analgesics such as morphine or fentanyl for pain, antibiotics, vitamins etc. (Maakaron, 2023). Some non-pharmacologic therapy could be a stem cell transplant (which could be curative), transfusions (RBC for anemia), physical therapy, heat and cold applications, acupuncture and acupressure, etc. (Maakaron, 2023). There is also an option for the combination of pharmacotherapy and non-pharmacotherapy. This is what my patient is receiving. She is receiving vigorous hydration (plus analgesics) for the vaso-occlusive crisis (pain crisis) (Maakaron, 2023).

History of sickle cell disease with worsening pain crisis. Symptoms started on 10/01 and are worse in the back, flank, and leg. Also complaining of headache. No nausea/vomiting, chest pain, or SOB. Has tried oxycodone and ibuprofen that did not work well. Pt. is rating pain 8-10 on numerical scale.

Assessment	
General	Pt. is A&O x 4. She does not seem like she is in distress but rates her pain 7/10 on the numeric scale. Groomed/appearance is appropriate for age.
Integument	Skin warm and dry to touch. Cap refill less than 3 seconds. No bruising, lesions, or rashes. Normal hair distribution. No cyanosis or clubbing
HEENT	nose. No lumps or lesions. Sclera tinted
Most recent VS (highlight if abnormal)	**Time: 1400** **Temperature: 98.4 F** **Route: Oral** **RR: 20** **HR: 89** **BP and MAP: 116/74** **Oxygen saturation: 97%** **Oxygen needs: RA**

Relevant Lab Values/Diagnostics

WBC: 10.13 (4.19-9.43)- pt. immune system is suppressed which makes this pt. easy to have an infection due to the stimulus for erythropoiesis. This is a lab that we can predict for pt with sickle cell (Yousif, 2022)

RBC: 1.58 (3.93-4.90) – body cannot replace blood cells fast enough to keep up with body needs in sickle cell disease (Villines, 2022)

Hgb: 5.7 (10.8-13.3) – this is related to the patient being diagnosed with sickle cell disease. Not able to produce enough red blood cells that the body needs (Villines, 2022)

Hct: 16.0 (33.4-40.4) – sickle cells break apart and die more easily than normal blood cells, causing low levels (Villines, 2022)

Calcium: 8.6 (8.9-10.6) – the body is not able to absorb calcium and vitamin D like normal (Nlemadim, et al., 2021)

BUN: 5 (8-21)- could be because of urea excretion and caused dehydration and the pain crisis (Phuong-Thu, 2023)

Cr: 0.51 (0.55-1.02) – SCD pt. can have a higher GFR, which will cause a lower Cr (Phuong-Thu, 2023)

Bili: 5.0 (0.2-1.2)- the sickle cell red blood cells break down faster than healthy red blood cells which increases Bili levels and risk for jaundice (CDC, 2024)

Medical History

Previous Medical History: sickle cell w/o crisis (date NA), sickle cell pain crisis 04/19/2023, acute chest syndrome 04/19/2023, PICA of infancy and childhood 11/03/2023/

Prior Hospitalizations: N/A

Past Surgical History: Tonsillectomy and adenoidectomy bilateral 08/29/2024

Social needs: No specifics noted, maybe case management to help with hospital costs/meds. Pt stated being alone all day because her mother had to be at work to “pay the bills”.

Active Orders

- **Incentive spirometer Q1hr while awake –** to help prevent respiratory complications and encourage deep breathing to prevent lung collapse.
- **Q4 vital signs –** to help assess pain along with making sure there are no suppressions with vital signs because of being on high-risk pain medications.
- **I&O –** sickle cell pt. is at a higher risk for becoming dehydrated. Need to make sure pt is continuing to intake and output within normal limits.
- **If fever over 102F, notify provider –** pt. has a suppressed immune system, we want to make sure infections are not happening or getting worse.
- **IV access –** for pt. to receive IV fluids, along with blood administration.

Pain and Pain Scale Used	7-10 numerical scale

Nursing Diagnosis 1 Ineffective tissue perfusion related to the pt rapid RBC destruction as evidence by the pt hemoglobin lab value (Salvador & Wagner, 2024)	**Nursing Diagnosis 2** Risk for decreased cardiac output related to low red blood cell count as evidence by the pt RBC lab value (Salvador & Wagner, 2024)	**Nursing Diagnosis 3** Chronic pain related to vaso-occlusive crisis as evidence by the pt. elevated pain scale (Salvador & Wagner, 2024)
Rationale Pt. hemoglobin lab value came back at 5.7 when normal lab value range is 10.8-13.3 according to Carle Epic documentation.	**Rationale** Pt. RBC value came back to 1.58 when normal range for this pt is 3.98-4.90 according to Carle Epic documentation**.**	**Rationale** Even with the high dosage pain medication, the pt. states that her pain is still a 7-10 on the numeric scale. She also was admitted into the hospital for sickle cell pain crisis.
Interventions **Intervention 1:** Oxygenate pt. as needed. **Intervention 2**: Transfuse RBCs as prescribed to enhance the quality RBC within the body (Salvador & Wagner, 2024)	**Interventions** **Intervention 1:** Administer oxygen as needed to prevent hypoxia (Salvador & Wagner, 2024) **Intervention 2:** Prepare for blood transfusion or red blood cell exchange to boost cardiac output by helping the body's circulation of healthy, oxygenated blood (Salvador & Wagner, 2024)	**Interventions** **Intervention 1:** ask the pts level and duration of pain every 2-4 hours, and each time before administering pain medication (Salvador & Wagner, 2024) **Intervention 2:** Assess the pt. fluid intake. This can often be a factor in the pt pain crisis (Salvador & Wagner, 2024). Keep pt hydrated.
Evaluation of Interventions Pt. will show increasing hemoglobin levels after receiving blood transfusion on 10/04/2024.	**Evaluation of Interventions** Pt. will maintain blood pressure and pulse rate within normal limits (Salvador & Wagner, 2024)	**Evaluation of Interventions** Pt. will be able to verbalize decreased pain using the numeric pain scale before discharge.

		What do you expect?	What did you observe?
Erickson's Psychosocial Developmental Stage	**Identity vs. Role confusion (Rudd & Kocisko, 2023)**	**Pt should be aware of her health condition and be able to know and understand the signs/symptoms of when health is getting worse.**	**Pt can express her pain levels along with symptoms of why she could be experiencing such pain.**
Piaget's Cognitive Developmental Stage	**Formal operational (Rudd & Kocisko, 2023)**	**Expect the patient to be a little more independent when making decisions upon her care and her pain management with her sickle cell pain crisis.**	**Pt knows what medications help with her pain and what doesn't. She also is very understanding and knows that blood transfusions and frequent checks are needed to happen to help with relief of medical symptoms.**
Age-Appropriate Growth & Development Milestones	**1. Aware of her individual rights (Rudd & Kocisko, 2023)** **2. Self-consciousness because of health disease** **3. Compares own body with others (Rudd & Kocisko, 2023)**		
Age-Appropriate Diversional Activities	**1. Watches favorite show** **2. Colors** **3. Listens to favorite music**		

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