HOLY FAMILY NURSING AND MIDWIFERY TRAINING COLLEGE BEREKUM

A CLIENT/FAMILY CENTERED CARE STUDY ON SICKLE CELL DISEASE

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A CLIENT/FAMILY CENTERED CARE STUDY ON SICKLE CELL DISEASE SUBMITTED TO THE NURSING AND MIDWIFERY COUNCIL OF GHANA IN PARTIAL FULFILLMENT FOR THE AWARD OF THE LICENSE TO PRACTICE AS A REGISTERED GENERAL NURSE.

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PREFACE

Virginia Henderson (1960-1964) defined nursing as assisting the individual whether sick or well in the performance of those activities contributing to health or peaceful death that he would perform unaided if he had the necessary strength, will or knowledge and to do this in such way to help him gain independence as rapidly as possible.

Nursing care has evolved from just caring for the sick and the dying, to an era of assisting people who seek health guidance and counseling, as well as promoting the health of individuals, their families and the entire community. There has also been an extension of care to the sick person's family and community, at large, in all aspects of health care. The Patient/ family care study is a detailed account of nursing care rendered to the Patient and family to meet their needs. The study is designed to give a comprehensive nursing care to both patient and family from the time of admission till when patient is finally discharged to go home, as well as follow-ups or home visits for continuity of care, hence care study has become mandatory for every final year student offering the Registered General Nursing (Diploma) programme. This is a pre-requisite for the partial fulfillment for the award of license to practice as a Registered General nurse by the Nursing and Midwifery Council (NMC) for Ghana. The study also involves the nursing process which involves assessment of patient/ family, planning of care to be rendered, implementing the plan and evaluating care rendered to patient/ family. The patient and family care study helps to broaden the scope of knowledge of the student nurse. It helps the student nurse to put his theoretical knowledge and skills acquired through training together to give a comprehensive care to patient and family. The patient and family care study also enhances the interpersonal relationship of the student nurse as he constantly communicates with the patient, relatives, friends and other health team in the various units of the hospital to provide comprehensive care of the patient. For the purpose of

confidentiality and security reasons, my patient's identity will not be disclosed; hence Miss B.S. will be used to represent patient's name throughout the script.

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Again, I am also grateful to my lovely parents Mr. Owusu Anderson and Mrs. Millicent Duodo not forgetting my lovely siblings Agyemang Opoku Kelvin, Opoku Duodu Kingsford, Opoku Kyere Christian and Naila Owusu Kyeraa for the financial, emotional, psychological and spiritual support throughout my education. I say God richly bless you and replenish whatever you lost through your support and encouragement. Finally, my thanks go to the authors from whose books information was extracted. May God richly bless you all.

INTRODUCTION

This script entails a patient/family care study written on Miss B.S., a 16-year-old girl. She comes from Kumasi in the Ashanti Region of Ghana. She was admitted the 7th December, 2022 with diagnosis of Sickle Cell Disease with vaso-occulsive crisis. She spent five days at the hospital and throughout her stay in the hospital, she had treatment and care geared towards complete recovery. On admission Miss B.S. presented with joint pains and general body weakness. Her vital signs were checked and recorded as temperature 38.0^0c, pulse 98bpm, respiration 21cpm and BP 130/86mmHg. The following laboratory test were ordered and carried out on Miss B.S. blood film for malaria parasites, blood for full blood count and urine routine examination. Intravenous normal Saline 0.9% 2 liter for 24 hours, pethidine injection 50mg/ml in 2ml stat, tablet morphine sulphate 10mg tds for 5 days, tablet cefuroxime 250mg bd for 5days, tablet paracetamol 1gram tds for 7 days, tablet folic acid 5mg for 1daily x 30days, intravenous cefuroxime injection 750 mg tds for 1 day and dextrose in Sodium Chloride 5% in 0.9% (500ml) 1L x 24hours were prescribed for her. With proper medical and nursing care Miss B.S. was discharged on 11th December, 2022 without any severe complication. Three home visits were embarked on and patient was handed over to community health nurse. First visit was embarked on the 9th December, 2022, second home visit 14th December, 2022 and third home visit 18th December, 2022.

This script is written, organized and compiled into six (6) chapters for easy reading and understanding.

Chapter one deals with the assessment of patient and family. Assessment in this chapter gives a general overview of the patient's particulars, family medical and surgical history, family socio-economic history, patient's developmental history, patient's concept of illness, obstetric history,

patient's lifestyle and hobbies and patient's past and present medical and surgical history, admission of patient, literature review and validation of data.

Chapter two entails data analysis. Analysis of data is the statistic that measures difference among group means and uses a statistical technique to equate the groups under study in relation to another given variable. Here, there is a comparison between the results of the investigations carried out and the normal values to detect any abnormality from normal.

Chapter three deals with the planning the care for patient and family where a nursing care plan is drawn and was used in the management of Miss B.S.

Chapter four of this study is the implementation phase of the nursing process involves carrying out the proposed plan of nursing care. It involves a summary of the actual nursing interventions rendered, preparation of patient for discharge and follow-up visits.

The fifth chapter is about the evaluation of care rendered to patient and family. The chapter also gives information about the amendment of nursing goals and the termination of the care rendered to patient and family.

The final chapter is the summary and conclusive part of the care rendered to the patient.

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CHAPTER ONE

ASSESSMENT OF PATIENT AND FAMILY

1.0 Introduction

Assessment is the first step and involves critical thinking skills and data collection; subjective and objective. Subjective data involves verbal statements from patient or caregiver. Objective data is measurable, tangible data such as vital signs, intake and output, and height and weight (Tammy & Jennifer, 2022). Assessment is the first step of nursing process which involves the collection, analysis and evaluation of patient's data so as to aid in an effective nursing care plan for patient. This phase deals with the collection of data from patient, family, friends and existing medical records. Data collection is also based on observation, interviews and examination. The importance of this assessment is to identify patient's health problems so that the appropriate nursing care would be rendered. This forms the bases of nursing care, since it aids the patient-centered care needed.

1.1 Patient Particulars

Patient's particulars are the details of information of the patient that has been recorded which includes; name, sex, date of birth and religion, marital status, next of kin, address and occupation. Miss B.S. is the name of the patient, she is a 16-year-old girl, born on 15th March, 2006 to Mr. K.B and Mrs. C.O. Miss B.S. is from a family of four and she is the first born of her parents. She comes from Kumasi in the Ashanti Region of Ghana. Currently, patient resides at Baako Niaba in Sunyani Bono Region. She lives with her parents with house number BN2637603 adjacent Miracle primary school, Sunyani. She speaks both English and Ghanaian

Language (Asante Twi). She is a Christian by religion and fellowships at Sunyani Church of Christ. She is fair in complexion. She weighs 30kg and a height of 1.45m with a BMI of 14.27kg/m^2 She has a complete set of teeth with black hair. She speaks both English and Asante Twi (native language). She attends Sacred heart Senior High School at Nsoatre. She has no physical impairment. She looks alert and playful. The food She likes best is Tuo Zafi. Miss B.S. likes playing volleyball. Her mother is a food Vendor and her dad is a metro bus driver. Her father uses the Kumasi-Bolga Road stretch. Her next of Kin is her father Mr. K.B. She is a beneficiary of the National Health Insurance Scheme (NHIS) with the NHIS number, 60558721 and her folder number at Sunyani Municipal Hospital was BE-AO1-AAJ9576.

1.2 Family's medical history

Family medical history is a record of the relationships among family members along with their medical histories. It focuses on the impact of psychosocial, ethnic, and cultural background on a person's health. Information is obtained on both paternal and maternal sides of family (Hinkle & Cheever, 2017).

According to Patient's mother, her family has a history of sickle cell. She said that apart from sickle cell, her family does not have any underlying or hereditary condition like Hypertension, diabetic mellitus, asthma or any mental disorder. She revealed that family members sometimes experience headache, abdominal pain and malaria which they usually purchase over-the counter drugs from the pharmacy to treat or sometimes treat with herbal preparations. Patient and family were educated to desist from buying over the counter/non-prescribed drugs and were encouraged to always visit the hospital whenever they are sick. According to patient, her grandparents, parents and siblings are all alive and are in good health. The source of treatment of Miss B.S. and

family is orthodox and herbal medicine. Patient and family have no known allergies. Miss B.S. has been hospitalized on several occasions in different hospitals on accounts of sickle cell disease (SCD).

1.3 Patient and family socio Economic History

Socio-economic history is a way of describing people based on their education, income and type of job. Socioeconomic status is usually described as low, medium and high ([NCI], 2020). It includes; family relationship/social cohesion, support systems, religious activity, source of medical care/financing (NHIS), parent employment, occupational hazards and income levels and wealth of family as well as traditions, norms, values, taboos and cultural practice.

According to patient and mother, there is a great, harmonious and peaceful relationship among the members of the family and between other people they live within the community. Miss B.S. revealed that, she is not financially sound since she was a minor and hence was not responsible for her life and upkeep. She is being supported by her parents. Both parents of patient earn almost 9,600 Ghana Cedi annually. Patient worships with the Church of Christ in Sunyani. Almost all of the members of the family are registered under the National Health Insurance Scheme (NHIS). Miss B.S. is a student at Sacred Heart Senior High School. She sometimes attends wedding and naming ceremonies. Patient and family abide and conforms to the traditions and taboos governing the community they live in.

1.4 Patient's Developmental History.

Development refers to the process of growth and differentiation which involves cognitive, psychosexual and psychosocial processes (Weller, 2019). Maturation is the process of

development in which an individual matures or reaches full functionality (Weller, 2019). Growth is the progressive development of a living thing, especially the process by which the body reaches its complete physical development (Weller, 2019).

According to mother, patient was born on 15th March, 2006. She was delivered spontaneously per vaginum with no complications. She was exclusively breastfed for the first six months. She was immunized against all the vaccine preventable diseases such as Polio, Measles and diphtheria as evidenced by Bacilli Clamette Guerin (BCG) mark on her right deltoid muscle indicating that she was immunized against Tuberculosis. She had a normal developmental milestone and child's developmental characteristics. She was able to sit at six (6) months and at the age of nine (9) months three weeks she started crawling. Patient did not suffer any childhood disease all according to the mother. Her milk teeth started erupting at the time she started crawling and started walking at the age of eleven (11) months. At one year eight months, she could talk and play with other children in the neighborhood. She started schooling when she was three (3) years at Miracle primary school, Sunyani of which she completed in 2020. She is now in Senior High School form two (2). Patient stated that she had no difficulty in learning.

Miss B.S. stated that she started developing secondary sexual characteristics at age fifteen which includes; growing of pubic hairs, development of breast, menstruation and widening of the hips. She had her menarche at age fifteen. According to patient, it's her aspiration to be a Nurse, therefore she is studying hard in order to accomplish that goal.

According to Erikson's theory of psychosocial development (1959), there are eight distinct stages with each possible result, been either success or failure.

Miss B.S. by age 16 years is classified under the fifth stage that is “Identity versus Role confusion (12 to 19 years)”. During this stage, adolescents search for a sense of self and personal identity, through an intense exploration of personal values, belief and goals. During adolescence, the transition from childhood to adulthood is most important. Children are becoming more independent and begin to look at the future in terms of career, relationships, families, housing, etc. the individual wants to belong to a society and fit in. This is a major stage of development where the child has to learn the role, he/she occupy as an adult. It is during this stage that the adolescent will re-examine his/her identity and try to find exactly who he or she is. Erickson suggests that two identities are involved; the sexual and the occupational. According to Bee (1992), what should happen at the end of this stage is “a reintegrated sense of self, of what one wants to do or be, and of one’s appropriate sex role”. During this stage the body image of the adolescent changes. Erikson claims that the adolescent may feel uncomfortable about their body for a while until they can adapt and “grow into” the changes. Success in this will lead to the virtue of fidelity. Fidelity involves being able to commit one’s self to others on the basis of accepting others, even when there may be ideological differences. During this period, they explore possibilities and begin to form their own based upon the outcome of their explorations. Failure to establish a sense of identity within society (“I don’t know what I want to be when I grow up”) can lead to role confusion. Role confusion involves the individual not being sure about themselves or their place in society. It was realized that Miss B.S. was in the identity stage of the psychosocial development because during an interaction with her, she knew what she wanted to become in future (Nurse). She was not confused about her career. According to her, she wants to become a Nurse because she is a kind and caring person who has the ability to care for people when they are in need. With this I was convinced that patient was in the Identity stage.

1.5 Obstetric History

Miss B.S. is gravid 0 para 0. According to her, she has never contracted any sexually transmitted infections (STIs) such as honorrhoea, syphilis, HIV/AIDS, among other. She has not also suffered from any breast conditions like breast cancer, mastitis and breast engorgement. She has never used any family planning method like condom or any hormonal contraceptives of any type.

1.6 Patient's Lifestyle and Hobbies

Patient lifestyle refers to pattern of daily living that an individual develops. On the initial assessment of a person entering the health care services this is considered in relation to the delivery of care by health care workers in order that the aims and objectives for care can be individualized (Weller, 2019).

According to patient's mother, Patient wakes up every morning at 6am, brushes her teeth with a toothbrush and tooth paste. Patient also empties her bowel twice daily and bladder whenever necessary. Patient normally takes tea with bread in the morning when on vacation. She normally eats rice and chicken stew with fruit juices such as kalyppo for lunch. She normally eats in between meals. On weekends, patient wakes up around 8:00am, visits the toilet, and brushes her teeth. She always helps her mother with her chores. She eats a three-square meal within the day and takes fruit beverages or fruits on its own. She has no known food/drug allergies. She also expresses herself clearly with her and with no intimidation. She again has normal sleeping pattern. Patient is an outspoken person and enjoys watching television, playing Volleyball with her friends'. She also likes dancing. Patient has no specific dislikes according to mother. She is drawn to anything she finds pleasure in. Miss B.S. sometimes attends social gathering like

funerals, wedding and naming ceremonies. She is a Christian and worships with the Church of Christ, Sunyani on Sundays. She does not use tobacco, alcohol or any illicit drugs like cocaine, marijuana, etc. She does not have any allergy to food or any drug. However, what she dislikes most is gossip, disrespect for the elderly, quarrels and laziness. She again renders apology to anybody she offends and forgives those who offend her too. Based on interaction and observation made on patient, she is an outgoing energetic lady.

1.7 Patient's Past Medical /Surgical History

Past medical history is a detailed summary of a person's past health (Hinkle & Cheever, 2017). Past medical history is a narrative or record of past events and circumstances that are relevant to a patient's current state of health. Among such information are childhood illness, allergies, accident and injury, physical disaster due to illness, medical check-up.

According to Miss B.S., she had no childhood illness like measles, whooping cough, diphtheria and other disease during infancy to adolescence. She has not had an accident before but has sustained minor injuries such as cuts from knives, and minor burns because she used to cook at home. She has been hospitalized many times at different hospitals and clinics. Miss B.S. was diagnosis with sickle cell disease when she was eight years old. Patient normally experiences minor ailments like headache, diarrhoea, common cold, cough which are always treated with drugs bought from the pharmacy shop and sometimes on out-patient basis at the hospital and clinics. She is on Tablet folic acid, vitamin B-complex and Fersolate. According to patient's mother, Miss B.S. stooped taken her medications since she had no crises. She usually goes for medical check-ups.

1.8 Patient's Present Medical History

Patient present medical history provides detail information about the chief complaints that led to patient's hospitalization. It gives information about when signs and symptoms started, how often problem occurs, activity which aggravate pain and the symptoms associated with the chief complaint.

Patient is a known sickle cell disease patient with genotype SC. She was in her usual state of health until she started experiencing joint pains, fever, bitterness in the mouth and general body weakness on the 7th December 2022 at 4:10am. She was immediately rushed to the Sunyani Municipal Hospital by her mother at 5:00am since she was well aware of the presenting signs and symptoms. Patient was detained in the Emergency unit and after thorough examination, she was being diagnosed as having the Sickle Cell Disease with Vaso Occlusive Crises and was admitted to the female medical ward for management.

1.9 Admission of patient

Admission occurs when a medical decision for the need for inpatient care is made by an appropriately qualified decision maker, a patient accepted by a hospital inpatient specialty service for ongoing management and the patient is administratively admitted to the hospital (Australasian College for Emergency Medicine [ACEM], 2022)

Admission of the patient is the process of allowing a patient to stay in hospital or unit for observation, investigation and treatment of the disease he/she is suffering from. Admission is also the initiation of care and it's usually refers to inpatient care.

Miss B.S. was admitted into the female medical ward of Municipal Hospital, Sunyani per ambulation accompanied by a student nurse and her mother in a conscious state on 7th December, 2022 around 10:00am with the diagnosis of sickle cell disease with vaso-occlusive crisis on referral from the emergency unit. They were welcomed to the nurses' station and seats were offered to them; I took over the patient from the student nurse as she handed over. Patient was made comfortable in an admission bed which was already made for her. On admission she complained of joint pains and general body weakness. On examination and observation, she was conscious and alert but was feverish (38.0^{o}c) and mother looked anxious. Patient was made comfortable in bed and her vital signs were checked and recorded as;

1. Temperature 38.0 degree Celsius
2. Pulse 98 beats per minute
3. Respiration 21 cycles per minutes
4. Blood Pressure 130/86mmHg

Patient's weight on admission was 30kg. Patient and mother were introduced to the staff nurses present and were assured of the competence of the health workers (nurses and doctors) who were going to take care of her throughout her stay at the hospital. The following information was obtained; patient's name, age, religion, address and allergies. The particulars taken were then entered into the admission and discharge book and in the daily ward state. Patient's mother was oriented to the ward, its annexes and the activities that goes on in the ward like visiting hours, time for medication and the time for checking vital signs. They were informed to bring items patient would need while she was on admission such as plates, cup, bowl, spoon, tissue paper, bathing soap, tooth brush and tooth paste, towel, sponge, bucket, adult diapers and comb. I introduced myself to patient and mother as a final year student of Holy Family Nursing and Midwifery

Training College, Berekum who would like to take her and her family for as a care study. Miss B.S. and mother were informed that the care study is a requirement by the Nursing and Midwifery Council of Ghana in partial fulfillment towards the award of a license to practice as a Registered General Nurse. I explained to patient and mother the concept of the patient/family care study and assured them of privacy and confidentiality. It was added that a report will be written after the entire event and will visit their home while still on admission and when she is been discharged home. Patient and her mother agreed to my request and promised to offer me the necessary information and assistance. I however, congratulated them on such a decision since doing so revealed a mark of a welcoming gesture. Hospital policies regarding visiting periods, payment of bills and the time vital signs will be checked were explained.

Discharged planning was initiated with the relative; thus, she will continue to care for patient (administering medication, making sure patient sleeps in treated mosquito net at home once she is well and discharged, eating hygienic and abiding by the education given to them on diet management). Patient was managed with;

1. Intravenous normal Saline 0.9% 2 liter for 24 hours
2. Pethidine injection 50mg/ml in 2ml stat.
3. Tablet morphine sulphate 10mg tds for 5 days.
4. Tablet cefuroxime 250mg bd for 5days.
5. Tablet paracetamol 1gram tds for 7 days
6. Tablet folic acid 5mg for 1daily x 30days
7. Intravenous cefuroxime injection 750 mg tds for 1 day.
8. Dextrose in Sodium Chloride 5% in 0.9% (500ml) 1L x 24hours

Drugs were collected from the pharmacy since patient is a National Health Insurance Scheme (NHIS) beneficiary. The following diagnostic investigations were requested and done for patient;

1. Blood for malaria parasites.
2. Blood for full blood count.
3. Urine Routine Examination.

Due to patient's complain of pains in the joints, a nursing diagnosis of Acute pain related to vaso-occlusive crisis as evidenced by complains of joint pains and self-rating of pain as "8" on the numerical pain rating scale was formulated. An objective of patient will be relieved of pains within 24hours as evidenced by patient rating pain as "2" or below on the numerical rating scale and Nurse visualizing patient ambulating without pain was set. Nursing interventions implement to achieve these objectives are as follows; patient was reassured that, measures such as ensuring rest and administering of drugs will be put in place to relieve her pains, patient's level of pain was assessed and patient rated it as 8 on the numerical pain rating scale of 0-10, A warm comfortable bed with warm blankets was provided for her to ensure rest, patient was encouraged to take in warm and adequate fluid, patient was engaged in diversional activities such as listening to music, prescribed intravenous fluids such as 2 litres of Normal saline was administered to flush rigid sticky sickled RBCs and restore microcirculation and prescribed pethidine 50mg in was administered to relieve her pain.

Miss B.S. was used for the study because I wanted to gain more knowledge about the condition (Sickle cell disease) that is the causes, clinical manifestation, diagnostic investigations, medical and nursing management and its complications.

1.10 Patient's concepts of illness

Patient/Family concept of illness is the understanding retained in the mind, from experience, reasoning or imagination about patient illness (Park, 2018). Miss B.S. had very little knowledge or idea about her condition and its recurrence. Patient's mother said she was frightened of the outcome of her daughter's condition. She was however enlightened about the cause of her daughter's condition. Patient was educated on her condition and all her doubts was clarified and relating questions were answered tactfully and to their outmost satisfaction. However, patient and mother did not attribute the disease to any spiritual force but rather as a result of their own negligence to inquire more from their health providers. Patient and her mother's expectations were that, she wanted her child to be well and healthy. Possibly so they could be discharged home. Patient's mother was optimistic that, the treatment given to her daughter can help in her illness resolution. She expressed her willingness to co-operate with staff.

1.11 Literature Review on Sickle Cell Disease

A literature review is a survey of scholarly sources on a specific topic. It provides an overview of current knowledge allowing you identify relevant theories, method and gaps in the existing research (scribbr, 2021).

This section reviews the material that is relevant to the medical and nursing diagnosis of the patient. It contains the standards of the patient's clinical manifestations, diagnostic investigations, treatment and other issues.

Review of Anatomy and Physiology of the Hematologic System.

The hematologic system consists of the blood and the sites where blood is produced, including the bone marrow and the reticuloendothelial system (RES). Blood is a specialized organ that

differs from other organs in that it exists in a fluid state. Blood is composed of plasma and various types of cells. Plasma is the fluid portion of blood; it contains various proteins, such as albumin, globulin, fibrinogen, and other factors necessary for clotting, as well as electrolytes, waste products, and nutrients. About 55% of blood volume is plasma (Hinkle, Cheever, & Overbaugh, 2021)

Blood

The cellular component of blood consists of three primary cell types: erythrocytes (red blood cells [RBCs], red cells), leukocytes (white blood cells [WBCs]), and thrombocytes (platelets). These cellular components of blood normally make up 40% to 45% of the blood volume. Because most blood cells have a short lifespan, the need for the body to replenish its supply of cells is continuous; this process is termed haematopoiesis. The primary site for haematopoiesis is the bone marrow. During embryonic development and in other conditions, the liver and spleen may also be involved (Hinkle, Cheever, & Overbaugh, 2021).

Under normal conditions, the adult bone marrow produces about 175 billion erythrocytes, 70 billion neutrophils (a mature type of WBC), and 175 billion platelets each day. When the body needs more blood cells, as in infection (when neutrophils are needed to fight the invading pathogen) or in bleeding (when more RBCs are required), the marrow increases its production of the cells required. Thus, under normal conditions, the marrow responds to increased demand and releases adequate numbers of cells into the circulation. Blood makes up approximately 7% to 10% of the normal body weight and amounts to 5 to 6 L of volume.

Circulating through the vascular system and serving as a link between body organs, blood carries oxygen absorbed from the lungs and nutrients absorbed from the gastrointestinal (GI) tract to the body cells for cellular metabolism. Blood also carries hormones, antibodies, and other substances to their sites of action or use. In addition, blood carries waste products produced by cellular metabolism to the lungs, skin, liver, and kidneys, where they are transformed and eliminated from the body. The danger that trauma can lead to excess blood loss always exists. To prevent this, an intricate clotting mechanism is activated when necessary to seal any leak in the blood vessels. Excessive clotting is equally dangerous, because it can obstruct blood flow to vital tissues. To prevent this, the body has a fibrinolytic mechanism that eventually dissolves clots (thrombi) formed within blood vessels. The balance between these two systems, clot (thrombus) formation and clot dissolution or fibrinolysis, is called haemostasis (Hinkle & Cheever, 2017).

Functions of the blood

According to American Society of Hematology (2021), the function of the human blood includes;

1. Transporting oxygen and nutrients to the lungs and tissues
2. It helps in the formation of blood clots to prevent excess blood loss
3. It carries cells and antibodies that fights infections
4. It brings waste products to kidneys and liver, which filter and clean the blood
5. It regulates the body temperature

Erythrocytes (Red Blood Cells)

The normal erythrocyte is a biconcave disk that resembles a soft ball compressed between two fingers. It has a diameter of about 8m and is so flexible that it can pass easily through capillaries that may be as small as 2.8m in diameter. The membrane of the red cell is very thin so that gases, such as oxygen and carbon dioxide, can easily diffuse across it; the disk shape provides a large surface area that facilitates the absorption and release of oxygen molecules. Mature erythrocytes consist primarily of hemoglobin, which contains iron and makes up 95% of the cell mass. Mature erythrocytes have no nuclei, and they have many fewer metabolic enzymes than do most other cells. The presence of a large amount of hemoglobin enables the red cell to perform its principal function, the transport of oxygen between the lungs and tissues. Occasionally the marrow releases slightly immature forms of erythrocytes, called reticulocytes, into the circulation. This occurs as a normal response to an increased demand for erythrocytes (as in bleeding) or in some disease states. The oxygen-carrying hemoglobin molecule is made up of four subunits, each containing a heme portion attached to a globin chain. Iron is present in the heme component of the molecule. An important property of heme is its ability to bind to oxygen loosely and reversibly. Oxygen readily binds to hemoglobin in the lungs and is carried as oxyhemoglobin in arterial blood. Oxyhemoglobin is a brighter red than hemoglobin that does not contain oxygen (reduced hemoglobin); thus, arterial blood is a brighter red than venous blood. The oxygen readily dissociates (detaches) from hemoglobin in the tissues, where the oxygen is needed for cellular metabolism. In venous blood, hemoglobin combines with hydrogen ions produced by cellular metabolism and thus buffers excessive acid. Whole blood normally contains about 15 g of hemoglobin per 100 mL of blood (Hinkle & Cheever, 2017).

Figure 2.1: Diagram of a Red Blood Cell

Red Blood Cell Destruction

The average lifespan of a normal circulating erythrocyte is 120 days. Aged erythrocytes lose their elasticity and become trapped in small blood vessels and the spleen. They are removed from the blood by the reticuloendothelial cells, particularly in the liver and the spleen. As the erythrocytes are destroyed, most of their hemoglobin is recycled. Some hemoglobin also breaks down to form bilirubin and is secreted in the bile. Most of the iron is recycled to form new hemoglobin molecules within the bone marrow; small amount is lost daily in the feces and urine and monthly in menstrual flow (Hinkle, Cheever, & Overbaugh, 2021).

Sickle Cell Disease (SCD)

Sickle cell disease (SCD) is a group of inherited red blood cell disorder. Red blood cells contain hemoglobin, a protein that carries oxygen. Healthy red blood cells are round and they move through small blood vessels to carry oxygen to all parts of the body. In someone who has SCD, the hemoglobin is abnormal, which causes the red blood cells to become hard and sticky and look like a C-shaped farm tool called a “sickle”. The sickle cells die early, which causes a constant shortage of red blood cells. Also, when they travel through small blood vessel, they get stuck and clog the blood flow. This can cause pain and other serious complications such as infection, acute chest syndrome and stroke (Center for Disease Control and Prevention [CDC], 2022).

Sickle cell disease is a group of disorders that causes red blood cells to become missharpen and break down. With sickle cell disease, an inherited group of disorders, red blood cells contort into sickle shape. The cells die early, leaving a shortage of healthy red blood cells (sickle cell anemia) and can blood blood flow causing pain (scikle cell crisis) (Mayo Clinic, 2022).

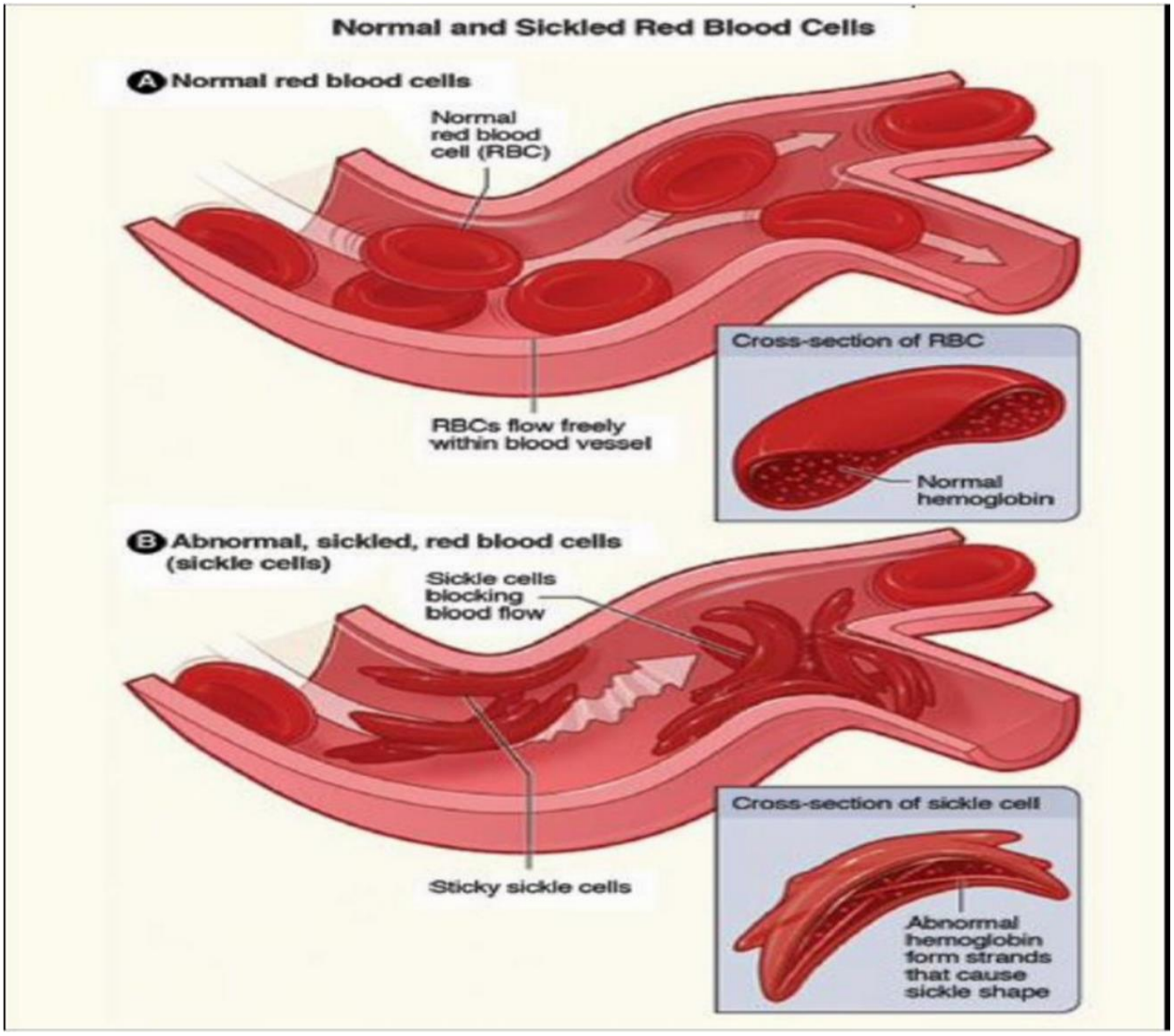

Figure 1.2: Diagram of a normal RBC and a Sickled RBC

Incidence

Sickle cell disease (SCD) affects millions of people throuhgout the world and is particularly common among those whose ancestors came from sub-Saharan; Spanish-speaking regions in the Western Hemisphere (South America, the Caribbean and Central American). It affects approximately 100,00 Ameriacns. SCD occurs among about 1 out of every 365 black or African-Ameriacn births. SCD occurs more often among people from parts of the world where malaria is

or was common.it is believed that people who carry the sickle cell trait are less likely to have severe forms of malaria ([CDC], 2022).

Types of Hemoglobin

There are two classes of hemoglobin. There are the normal and the abnormal hemoglobin.

Normal types of hemoglobin include;

a. Hemoglobin (Hgb) A: the most common type of hemoglobin in healthy adults
b. Hemoglobin (Hgb) F, fetal hemoglobin: This type of hemoglobin is found in unborn babies and newborns. HgbF is replaced by HgbA shortly after birth (MedlinePlus, 2021).

If levels of HgbA or HgbF are too high or too low, it can indicate certain types of anemia.

Abnormal types of hemoglobin include:

1. Hemoglobin (Hgb) S: This type of hemoglobin is found in sickle cell disease. Sickle cell disease is an inherited disorder that causes the body to make stiff, sickle-shaped red blood cells. Healthy red blood cells are flexible so they can move easily through blood vessels. Sickle cells can get stuck in the blood vessels, causing severe and chronic pain, infections, and other complications.
2. Hemoglobin (Hgb) C. This type of hemoglobin does not carry oxygen well. It can cause a mild form of anemia.
3. Hemoglobin (Hgb) E. This type of hemoglobin is mostly found in people of Southeast Asian descent. People with HgbE usually have no symptoms or mild symptoms of anemia (MedlinePlus, 2021).

Four different hemoglobin species are commonly recognized:

1. Oxyhemoglobin (oxy-Hb)
2. Deoxyhemoglobin (deoxy-Hb)
3. Methemoglobin (met-Hb)
4. Hemichromes

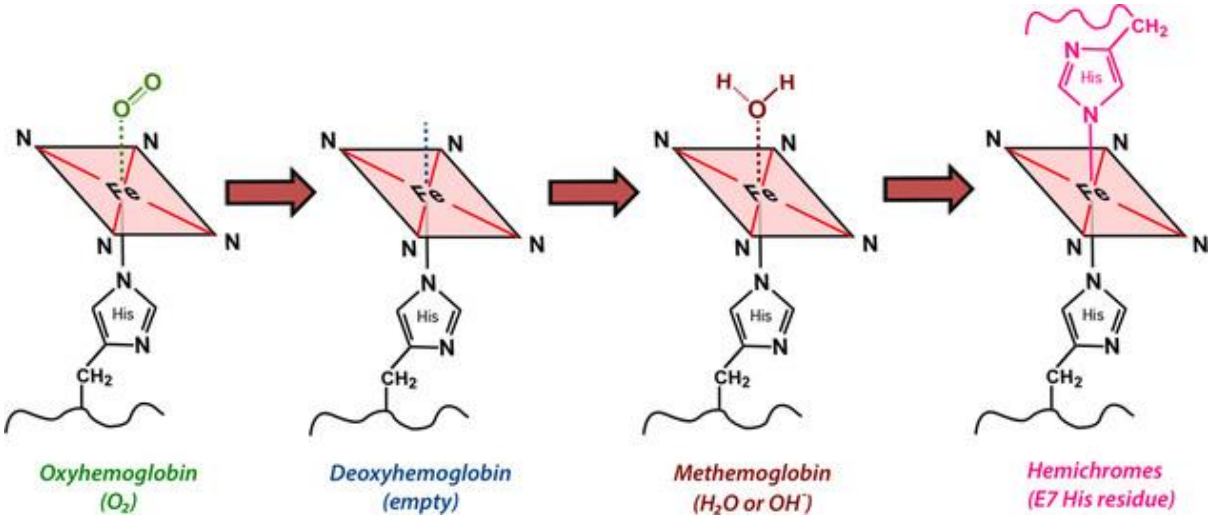

Figure 1.3: Diagram of the types of Haemoglobin

Following this evolutionary transition methemoglobin and hemichromes are enzymatically cleaved into multiple small fragments. Iron atoms are released, but coalesce by the thousands into large, chunky metallo-protein complexes known as ferritin and hemosiderin. Ferritin and hemosiderin are engulfed by invading macrophages and ultimately deposit along the walls of the old hematoma cavity.

Forms of Sickle Cell Disease

According to Sickle Cell Association of the National Capital Area, Inc [SCANCA, INC], There are several types of sickle cell disease. The most common are: Sickle Cell Anemia (SS), Sickle Hemoglobin-C Disease (SC), Sickle Beta-Plus Thalassemia and Sickle Beta-Zero Thalassemia.

1. Sickle Cell Anemia (SS): When a child inherits one substitution beta globin genes (the sickle cell gene) from each parent, the child has Sickle Cell Anemia (SS). Populations that have a high frequency of sickle cell anemia are those of African and Indian descents.
2. Sickle Hemoglobin- C Disease (SC): Individuals with Sickle Hemoglobin-C Disease (SC) have a slightly different substitution in their beta globin genes that produces both hemoglobin C and hemoglobin S. Sickle Hemoglobin-C disease may cause similar symptoms as sickle cell anemia but less anemia due to a higher blood count level. Populations that have a high frequency of Sickle Hemoglobin-C disease are those of West African, Mediterranean and Middle Eastern descents.
3. Sickle Beta-Plus Thalassemia: Individuals with Sickle Beta Thalassemia (SB) disease also contain substitutions in both beta globin genes. The severity of the disease varies according to the amount of normal beta globin produced. When no beta globin is produced, the symptoms are almost identical to sickle cell anemia, with severe cases needing chronic blood transfusions. Populations that have a high frequency of Sickle Beta Thalassemia are those of Mediterranean and Caribbean descents.
4. Sickle Hemoglobin-D Disease: Through research, hemoglobin D, which is a different substitution of the beta globin gene, has been found to interact with the sickle hemoglobin gene. Individuals with Sickle Hemoglobin-D disease (SD) have moderately

severe anemia and occasional pain episodes. Populations that have a high frequency of Sickle Hemoglobin-D disease are those of Asian and Latin American descents.

5. Sickle Hemoglobin-O Disease: Hemoglobin O, another type of substitution in the beta globin gene, also interacts with sickle hemoglobin. Individuals with Sickle Hemoglobin-O disease (SO) can have symptoms of sickle cell anemia. Populations that have a high frequency of Sickle Hemoglobin-O disease are those of Arabian, North African and Eastern Mediterranean descents.

Causes of Sickle Cell Disease

Sickle cell disease is a genetic condition that is present at birth. It is inherited when a child receives two genes that is one from each parent that code for abnormal hemoglobin ([CDC], 2022). If a person has a faulty gene form just one parent, they will have sickle cell trait but not sickle cell disease. If a person inherits a faulty gene from each parent, they will have sickle cell disease (Biggers, 2020).

Pathophysiology

Sickle Cell Disease (SCD) is caused by a mutation in the gene that encodes the beta-globin chain of the hemoglobin molecule. The mutation results in the formation of sickle hemoglobin (HbS), which has the unique feature of polymerizing on deoxygenation. Because of a single base-pair point mutation (GAG to GTG) in the beta-globin gene, the amino acid glutamic acid (which is hydrophilic) is replaced by valine (which is hydrophobic) at position 6 of the beta-globin molecule, resulting in the formation of HbS. HbS polymerization causes erythrocyte sickling, leading to vaso-occlusion and episodes of ischemia, referred to as crises. Organs including the

brain, bones, lungs, spleen, and liver can be severely damaged during crises, with substantial morbidity and mortality (Dhingra, 2021).

The normal hemoglobin contains two alpha and two beta chains. There are two genes for the synthesis of each chain. People with trait AS and AC have inherited only one of the abnormal gene so their red blood cell can synthesis both normal beta chain and beta sickling. Thus, they have normal A and hemoglobin S. If two people with the trait marry, a part of their children may inherit two abnormal genes and will then have only beta sickling chain and hemoglobin S. These children have the condition.

The sickling hemoglobin is less soluble than hemoglobin A, especially when it gives out its oxygen and when the pH is below normal, firm crystals are formed within the cells which are distorted and assume a crescent or sickle shape. It increases the viscosity of the blood which does not flow readily through the capillary. The hemoglobin lifespan is about 26-35 days instead of the normal 120 days, so there is frequent breakdown of the red blood cell causing jaundice.

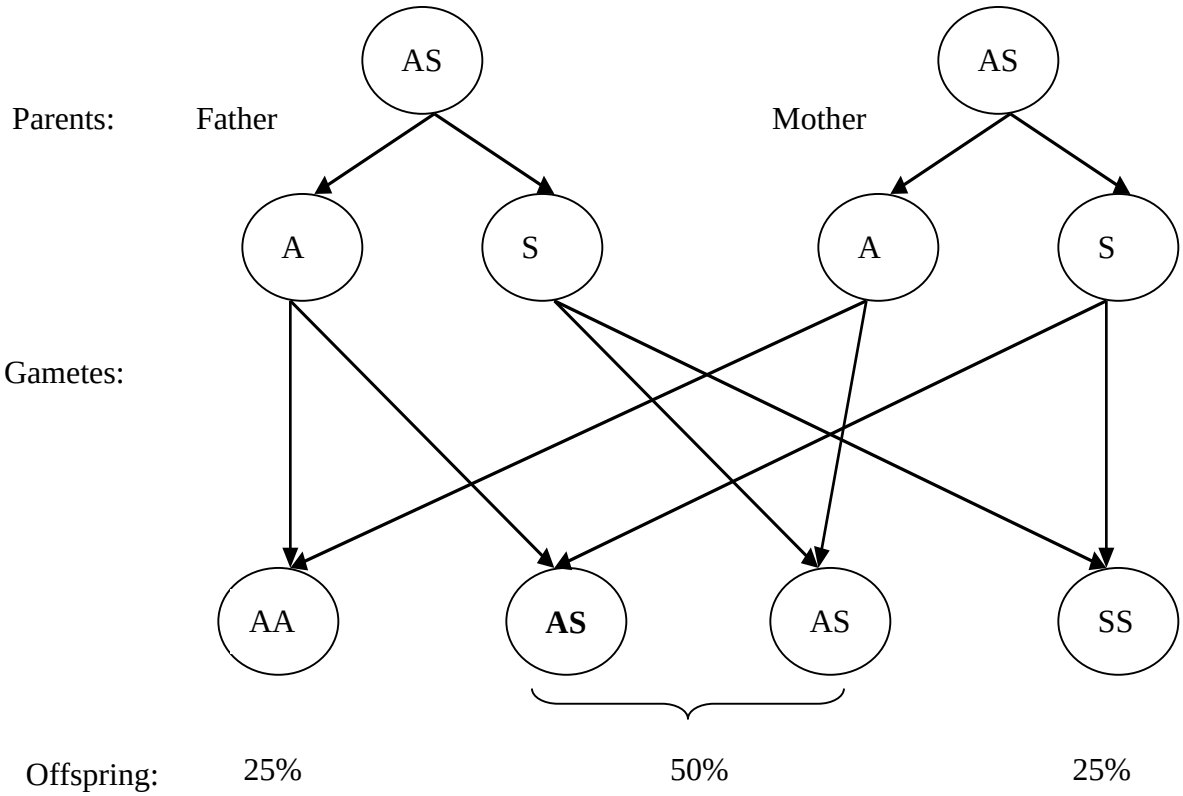

Figure 1.4: Inheritance pattern for Sickle Cell Disease

The above illustration if figure 4 indicate that there is 25% chance of having a normal hemoglobin (AA), 25% for the infant to develop sickle cell anemia (SS) and 50% chance of being a carrier or possessing sickle cell trait (AS) when both parents are carriers of the sickle cell trait.

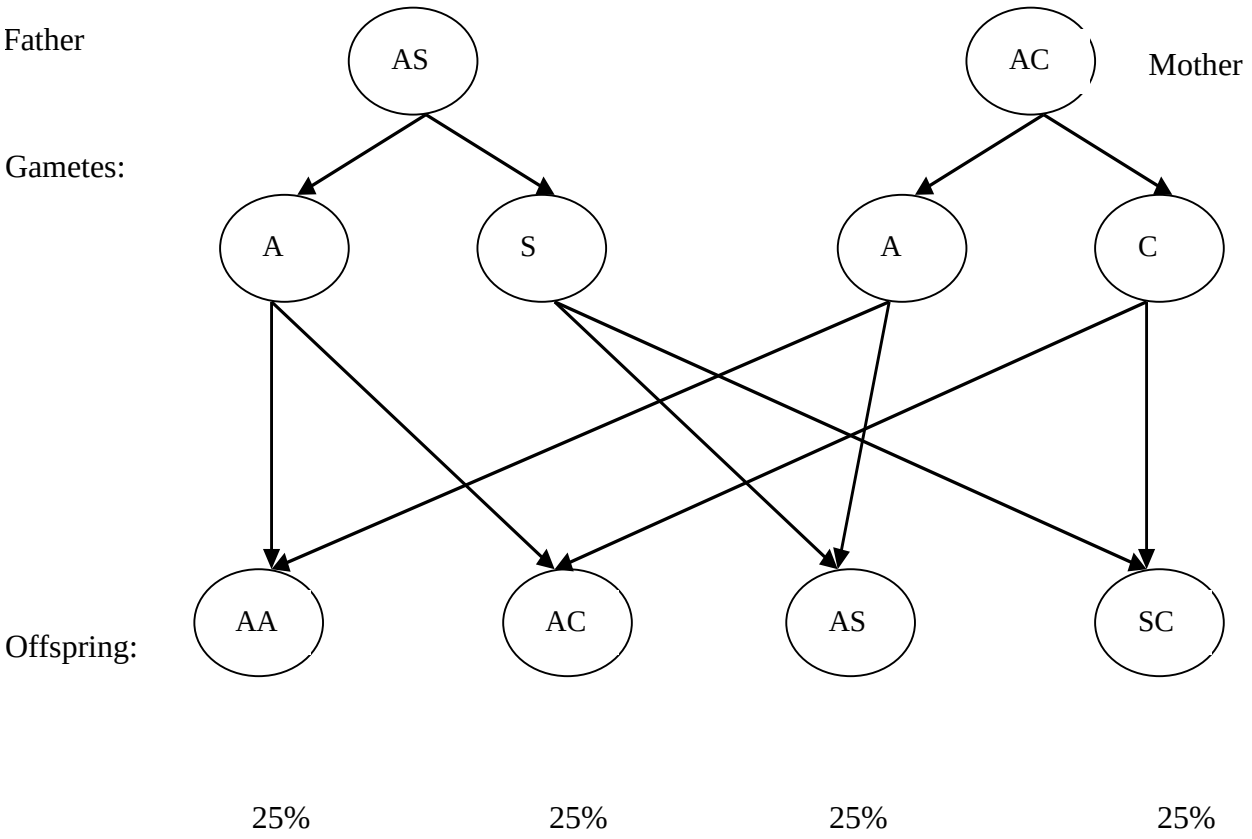

Figure 1.5: Inheritance pattern for Sickle Cell Disease

From figure 5, When one parent has a sickle cell trait (AS) and the other (AC), there is 25% chance of having normal hemoglobin (AA), 25% chance of possessing a trait of either (AC) and 25% chance of becoming a carrier with (AS) trait while there is another chance 25% carrying an abnormal (SC).

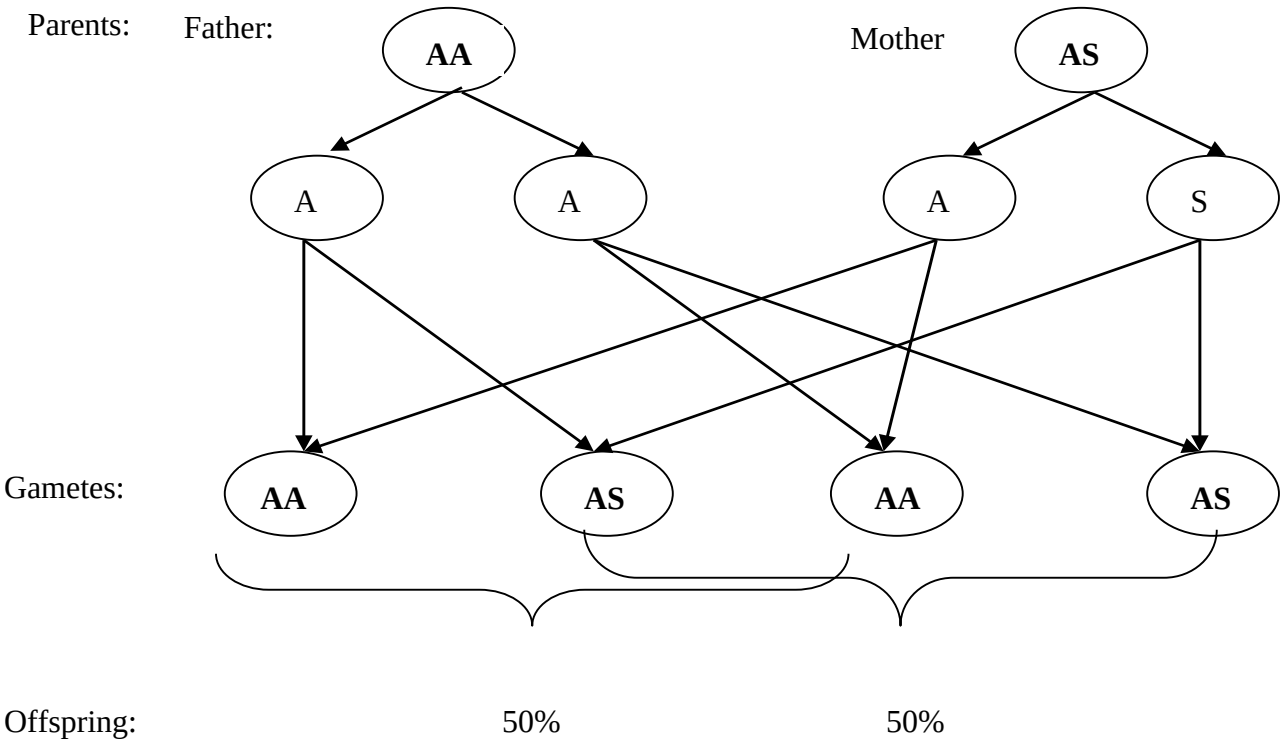

Figure 1.6: Inheritance pattern for Sickle Cell Disease

The illustration in Figure 6, above indicates that when two parents with one being a carrier (AS) and the other having a normal hemoglobin (AA), there is 50% chance of their offspring having normal hemoglobin (AA) and 50% chance of possessing sickle cell trait or being carriers (AS).

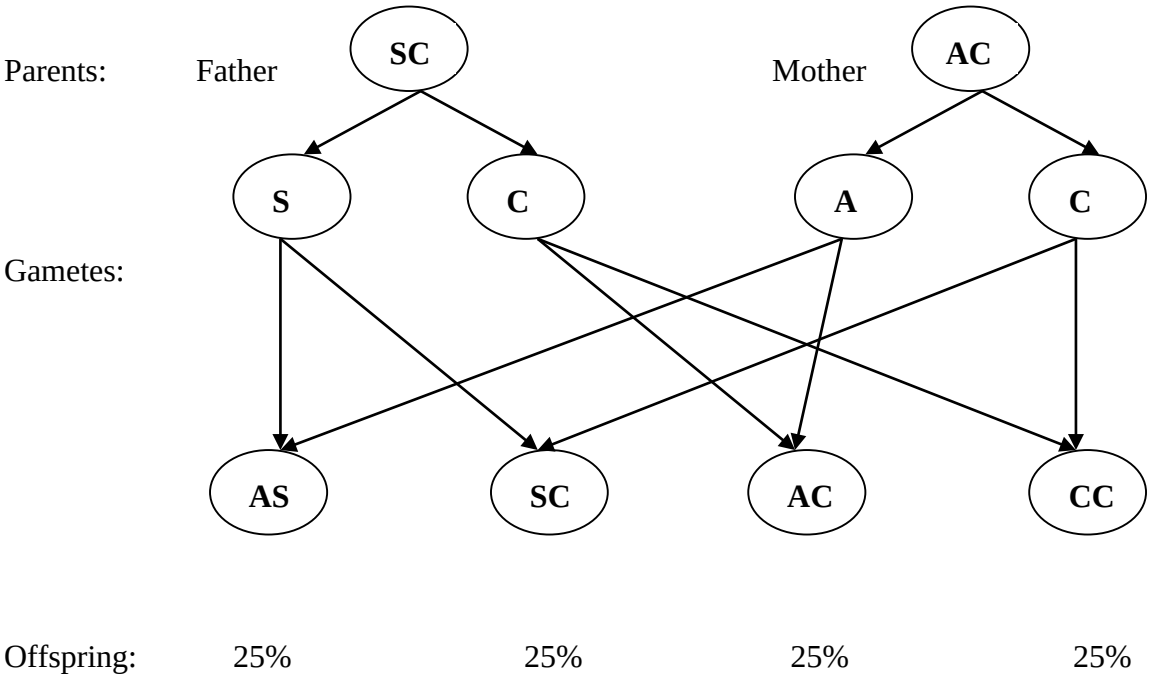

Figure 1.7: Inheritance pattern for Sickle Cell Disease

Figure 7 illustrates one parent being a sickle cell carrier (AC) and the other sickle cell (SC). In this case, there is 25% chance of their offspring being carrier AS, AC or CC with the remaining 25% having sickle (SC).

Diagnostic investigation of sickle cell disease

According to Hinkle and Cheever (2017), the diagnostic investigations for sickle cell disease includes;

1. Blood for Full blood count
2. Genetic screening
3. Physical examination and clinical manifestation

Sickle Cell Crisis

A sickle cell crisis is a painful episode that may begin suddenly in a person who has sickle cell disease. A sickle crisis occurs when sickle-shaped red blood cells clump together small blood vessels that carry blood to certain organs, muscles and bones. This causes mild to severe pain. The pain can last from hours to days. “Painful event” and “painful crisis” are other terms used to describe these episodes (Husney & Gabica, 2021).

Types of Sickle Cell Crisis

According to Mahesh and Kondamudi (2022), there are five types of sickle cell crisis. These are;

1. **Vaso-occlusive Crisis (VOC):** Patients present with moderate to severe pain, which has variable intensity and frequency. Young children can have severe pain and swelling of both hands and feet (dactylitis). Most patients with SCD experience pain by the age of 6 years. Pain can begin from any part of the body but frequently affects the extremities and back and chest areas. Fever can accompany vaso-occlusive crisis in some patients. Although pain in patients with SCD is likely to be due to VOC, it is prudent to perform a thorough evaluation for other life-threatening causes that can be misattributed to sickle cell pain. There is no objective measure or lab test to determine the quality and severity of pain in SCD, and therefore, patient report is the only available guide.
2. **Splenic Sequestration Crisis:** Patients with SCD have spleen infarction before the end of childhood. The spleen is affected due to its narrow vessels and its role as a key player in the lymphoreticular system. Splenic sequestration crisis causes acute, painful

enlargement of the spleen due to intrasplenic trapping of red cells. Patients with splenic sequestration crisis may have a sudden drop in hemoglobin levels, and one should be vigilant about hypovolemic shock. If not treated promptly, this can be a life-threatening situation.

3. **Aplastic Crisis:** Sickling Crisis presents with sudden pallor and weakness confirmed by rapidly dropping hemoglobin levels that are accompanied by reticulocytopenia. The usual trigger for aplastic crisis is parvovirus B19 that directly suppresses the bone marrow affecting RBC production, but it can also be caused by other viral infections. The shortened lifespan of RBC in SCD results in worsening of the patient's baseline anemia, which can dip to dangerously low levels. The infection is self-limited, typically lasting 7 to 10 days.
4. **Acute Chest Syndrome (ACS):** This complication of SCD accounts for 25% of deaths and can follow vaso-occlusive crises. The trigger for ACS is frequently hypoxia due to hypoventilation of the chest caused by VOC crisis. It could also occur as a result of fat embolism originating from the distal bone in VOC. The hypoxia leads to adhesion of sickled erythrocytes to pulmonary microvasculature, setting up local hypoxia in the lungs and causing sickling of more RBCs; this sets up a vicious cycle. The presenting symptoms and signs include fever, cough, tachypnea, chest pain, hypoxia, wheeze, respiratory distress, and even failure. Any pulmonary infiltrate on chest radiography accompanied by abnormal lung findings should raise the suspicion of ACS.
   Affected patients can rapidly progress to worsening respiratory failure and death if not aggressively treated and monitored.

5. **Hemolytic Crisis:** An acute drop in hemoglobin level marks this crisis. It is common in patients with coexistent G6PD deficiency.

Precipitating Factors

1. Local tissue hypoxia
2. Environmental exposure to heat or cold
3. Fatigue
4. Psychological stressors
5. Dehydration secondary to infection
6. Acidosis
7. Excessive alcohol intake
8. Poor nutrition
9. Viral illness
10. High altitudes
11. Arduous physical labour (Buchanan-Perry, 2019).

Signs and symptoms of vaso-occlusive crisis

According to Anaebere and Armitage (2022), the signs and symptoms of vaso-occlusive crisis are;

1. Weakness and fatigue
2. Headache
3. Dizziness or lightheadedness
4. Yellowing of the skin and eyes (jaundice)
5. Swelling in the hands and feet

6. Anemia
7. Chest pain and shortness of breath
8. Frequent infections
9. Vision problems
10. Episodes of pain
11. Joint pain
12. Edema

Specific Medical Treatment

There is no effective form of treatment for sickle cell disease. The use of drug is often for supportive and conservative treatment. The basic aim of the treatment is to alleviate symptoms and control or reduce painful crisis;

1. Analgesics examples morphine, and ibuprofen given to alleviate pain of vaso-occlusive crisis and anti-pyretics for temperature.

2. Vitamin supplements such as Folic acid, Vitamin B-complex and Fersolate to boost appetite and prevent anemia

3. Antibiotics like Cefuroxime, cefataxine, cerfezidime, ceftriaxone and ciprofloxacin

4. Intravenous normal saline and dextrose saline are often prescribed to correct fluid and electrolytes imbalance, reduce blood viscosity and prevent vaso – occlusive crisis.

5. Oxygen therapy is given to prevent hypoxemia.

6. Blood transfusion may be necessary in cases of sickle cell anemia.

Nursing Management

1. **Reassurance**
    a. Patient is reassured that she is in the hand of competent stuff or health team, this will help relax patient and relieve from anxiety, restore comfort and co-operation and establish good rapport.
    b. Other measures that are put in place for reassuring patient and giving psychological are include giving diversional therapy such as watching television, listening to music etc. then to distract her attention especially during patient's period of pain and anxiety.
    c. Patient could also be introduced to other patients responding to treatment to help relax patient. All bright lights should be switched off and dim lights replaced when necessary. Activities that are going to be carried on patients should be well organized not to interfere with patient's sleep.
    d. Allow patients and relatives to express their fears and anxiety by asking questions. Provide answers for them in simple terms to their understanding and refer the rest to any officer or nurse in charge to answer.
    e. Introduce patient and family to other patients with similar condition who are recovering to talk to patient and family to help boost their confidence.
2. **Observation**
    a. Monitor vital signs, i.e., Temperature, Pulse, Respiration, Blood Pressure and Oxygen Saturation level are monitored and recorded every four hourly in nurse's note and report any abnormalities, this will help to access progression in the patient's condition.

b. Assess patient's hydration status. Thus, monitor intake and output and check for signs of dehydration such as cracked lips and dry lips. Record the results in the intake and output chart.

c. Assess for tenderness and swelling of the joint's deformities.

d. Observe patient's level of consciousness, thus orientation to time, place and situation.

e. Monitor for signs and symptoms of sickle cell crisis and chronic complications like congestive heart failure. Observe for signs and symptoms of infections such as fever or chills.

f. Monitor patient's respiratory status. Perform respiratory assessments including auscultation of breath sounds regularly. Observe the rate of flow of intravenous infusion to prevent fluid overload.

g. Observe the amount, odor and color of patient's urine.

3. Position

a. Patient is made to assume a position that does not contraindication to her condition to enhance her comfort and promote early recovery. This will also enhance comfort, release pressure of the chest and joints, maintain patient airway and promote circulation. It also helps to minimize pains.

4. Protection From Injury

a. Patient is protected from injury by nursing patient on a low bed with side rails.

b. Sharp instruments are also taken away from the patient's vicinity.

c. The floor of the ward should be kept dry to prevent from slipping and falling.

d. Oxygen cylinders would be taken away when not in use to prevent it from falling on the patient and tourniquets would be removed after use.
e. If patient can tolerate, nurse patient in a bright environment to enhance visibility.

5. Rest and Sleep

a. Rest and sleep help to enhance recovery processes, conserve energy, reduce metabolic activity, relax patient and promote general wellbeing.
b. Encourage bed rest with head elevated to decrease tissue oxygen demand. This is ensured by providing a comfortable bed which is free from creases and crumbs.
c. Remove unpleasant odor from bedside and open nearby windows to provide adequate ventilation.
d. Warm drinks should be served in the evening and provide warmth to stimulate sleep.
e. Organize and perform all nursing activities in order not to disturb sleep.
f. Soiled bed linen would be changed to enhance comfort.

6. Personal Hygiene

a. Ensure that patient maintains adequate personal hygiene.
b. Assist patients to bath twice daily to prevent body odor.
c. Maintain adequate oral hygiene to prevent halitosis.
d. Care of the hands and feet of patients to prevent infection.
e. The hair should be cleared regularly with soap and water to prevent lice infestation.
f. Fingernails and toe nails would be cared for by cutting it short to prevent them from harboring microbes.

g. Treat pressure areas to prevent bedsores and apply Vaseline. Change patient's position every two hours to prevent the developments of bedsores.

h. Educate patient to wash hands her hands before and after eating using soap and under running water and also after visiting the toilet to prevent infection.

7. Nutrition

a. Ensure that patient receives adequate amount of folic acid rich foods such as green leafy vegetables.

b. Serve high caloric diet to give patient energy and enough protein like fish and eggs to build and repair worn out tissues.

c. Encourage adequate fluid intake to hydrate the patients.

d. Meals served should be supplemented with fruits and vitamins to boost the immune system.

e. If there are food restrictions, discuss with the patient and give rationales to help her practice.

f. Serve food warm to patient.

g. Provide snacks in between meals and also food should be served in bits to stimulate appetite.

8. Provision of Comfort

a. Apply warm compress, warm thermal blankets and pads to painful areas of patient's body to relieve pain. Never apply cold to painful areas.

b. Ensure patient's mouth is well cleaned before serving her meals to stimulate appetite.

9. Elimination

a. It includes bowels and coronary elimination. Serve patient bedpan and urinal on request. Observe amount, odor and color of stool and urine.
b. Ensure that patients meal contain adequate amount of roughage to prevent constipation.
c. Encourage adequate fluids and intake to enhance free bowel movement.

10. Exercise

a. Depending on the patient's ability to tolerate the nurse, perform mild to moderate exercises with patient. This will help to promote circulation, prevent embolism, joint stiffness and muscle wasting.
b. The patient can be made to sit up in bed around her bed with the help from a nurse or relative.
c. She can also be made to undertake range of motion exercises such as flexion, abduction and rotation.

11. Pain Management

a. Assist patient to assume a comfortable position and painful areas with firm pillows.
b. Allow warm or cold compresses on the pain site to help reduce pain.
c. Allow patient to rest in order to promote circulation and reduce pain.

d. Engage patient in diversional therapy such as reading an interesting storybook or listening to music or engaging in an interesting conversation. These will take her mind off the pain and calm nerves.
e. Administering prescribed analgesics to relieve her of the pain.

12. Education

a. Educate patient to avoid cold temperatures, infection, strenuous exercise and high altitude as this trigger sickle cell crisis.
b. Emphasis on the need to prompt treatment of infection to prevent sickle cell complication. Explain the need to increase fluid intake to prevent dehydration.
c. Stress on the need to inform all health care providers that She has sickle cell disease before She undergoes any treatment. Suggest and encourage patient to join appropriate support group such as the National Association for Sickle Cell Disease.
d. Encourage patient to take in adequate amount of folic acid rich foods like green leafy vegetables to prevent anemia.
e. Teach patient to take in meals that contain adequate of roughages to prevent constipation and foods rich in protein and carbohydrate to repair worn out tissues and give energy as well. Teaching aids may be used to clarify issues. Ask patient for feedback and thank her for her co-operation.

Complications of Sickle Cell Disease

According to Mayoclinic (2022), Sickle cell anemia can lead to a host of complications, which includes:

1. **Stroke:** Sickle cells can block blood flow to an area of the brain. Signs of stroke include seizures, weakness or numbness of the arms and legs, sudden speech difficulties, and loss of consciousness. If your child has any of these signs and symptoms, seek medical treatment immediately. A stroke can be fatal.
2. **Acute chest syndrome:** A lung infection or sickle cells blocking blood vessels in the lungs can cause this life-threatening complication, resulting in chest pain, fever and difficulty breathing. It might require emergency medical treatment.
3. **Pulmonary hypertension:** People with sickle cell anemia can develop high blood pressure in their lungs. This complication usually affects adults. Shortness of breath and fatigue are common symptoms of this condition, which can be fatal.
4. **Organ damage:** Sickle cells that block blood flow to organs deprive the affected organs of blood and oxygen. In sickle cell anemia, blood is also chronically low in oxygen. This lack of oxygen-rich blood can damage nerves and organs, including kidneys, liver and spleen, and can be fatal.
5. **Splenic sequestration:** A large number of sickle cells can get trapped in the spleen, causing it to enlarge and possibly causing belly pain on the left side of the body. This can be life-threatening. Parents of children with sickle cell anemia should learn to regularly feel their child's spleen for enlargement.

6. **Blindness:** Sickle cells can block tiny blood vessels that supply the eyes. Over time, this can lead to blindness.
7. **Leg ulcers:** Sickle cell anemia can cause painful open sores on the legs.
8. **Gallstones:** The breakdown of red blood cells produces a substance called bilirubin. A high level of bilirubin in the body can lead to gallstones.
9. **Priapism:** In this condition, men with sickle cell anemia can have painful, long-lasting erections. Sickle cells can block the blood vessels in the penis, which can lead to impotence over time.
10. **Deep vein thrombosis:** Sickling of red cells can cause blood clots, increasing the risk of a clot lodging in a deep vein (deep vein thrombosis) or a lung (pulmonary embolism). Either can cause serious illness or even death.
11. **Pregnancy complications:** Sickle cell anemia can increase the risk of high blood pressure and blood clots during pregnancy. It can also increase the risk of miscarriage, premature birth and having low birth weight babies.

1.12 Validation of data

This is the process to confirm or verify that data collected is correct. The purpose of verifying the data collected is to keep it free from any errors, bias and misinterpretations (Mosby, 2019).

It is the confirmation and verification of data collected. This is to keep the information free from errors, biases and misinterpretation as much as possible. All information collected from patient and her family were confirmed by patient, family members, health team, ward staff nurses, laboratory investigations, literature review, medical records and textbooks. Therefore, the data collected is accurate and factual free from errors and misinterpretations.

CHAPTER TWO

ANALYSIS OF DATA

2.0 Introduction

Analysis of data is the process of systematically applying statistical and /or logical techniques to describe and illustrate, condense and recap, and evaluate data (Johnson, 2020)

Data analysis has multiple facets and approaches, encompassing diverse techniques, under a variety of names in different business, science and social domain.

This aspect of the care study deals with the critical examination and interpretation of the data collected during the assessment of the patient. Here, there is a comparison between the results of the investigations carried out and the normal values to detect any abnormality from normal. Again, there is a comparison between the causes, clinical manifestations, treatment and complications in the literature review to those ones of the patient. This chapter also deals with the patient and family strengths, their health problems and the corresponding nursing diagnosis. It is the second phase of the nursing process and it helps the nurse to draw conclusion from the data collected.

2.1 Comparison of Data with Standards

This is comparing the data collected with that of the standards. The following data will be compared with standards;

A. Diagnostic test/ investigations

B. Causes

C. Clinical manifestation

D. Treatments

E. Complications

2.1.1. Diagnostic Investigations/Tests

It is simply defined as identification of a condition, disease, disorder, or problem by systematic analysis of the background or history, examination of the signs or symptoms, research or test results, and investigation of the assumed or probable causes.

The following investigations were carried out on Miss B.S. to aid in the diagnosis and treatment;

1. Blood film for malaria parasite (MPs)

2. Full Blood Count (FBC)

3. Urine Routine Examination

Table 2.1: Diagnostic Investigations/Tests in Literature Review Compared with Those Carried Out on Patient.

Diagnostic Investigation in Literature.	**Diagnostic Investigations carried out on Miss B.S.**
Clinical manifestation	Clinical manifestation was used to confirm patient's condition.
History and physical examination	History and physical examination were done for patient
Complete or Full blood count	Full blood count was done for patient
Genetic screening	Genetic screening was not done for patient

Urine routine examination was done for patient but was not indicated in the literature review. Diagnosis for Miss B.S. was based on clinical manifestations, history, physical examination and results of full blood count.

Table 2.2: Results of Diagnostic Investigation

Date	Specimen	Investigation	Results	Normal Values	Interpretation	Remarks
7/12/2022	Blood	Blood film for malaria parasites	Negative	No malaria parasites should be present.	Negative means there is no presence of malaria parasites	No treatment was given.
7/12/2022	Blood	**Full Blood Count**				
		WBC	10.67 x 10^9/L	3.50-9.50 x 10^9/L	WBC is above normal range	Tablet cefuroxime 250mg bd for 5days
		MCV	84.6fL	37.0- 54.0fL	MCV level is above normal values.	No treatment given
		Lymphocyte	2.952 x 10^9/L	1.100-3.200 x 10^9/L	Lymphocyte are within normal values	No treatment given
		Hemoglobin estimation	10.2g/dL	Males: 11-18g/dl Female:11-15g/dl Children:14-16g/dl	Hemoglobin level is slightly below normal values.	Tablet folic acid 5mg daily

Table 2.3: Results of Diagnostic Investigation continue

Date	Specimen	Investigation	Results	Normal Values	Interpretation	Remarks
7/12/2022	Urine	Leukocytes in urine	Negative	Negative	Leukocytes in urine were within normal range	No Treatment given
		Nitrates in urine	Negative	Negative	Nitrates in urine were within normal range	No Treatment given
		Bilirubin in urine	Negative	Negative	Bilirubin in urine were within normal range	No Treatment given
		Proteins in urine	Trace	Negative	Protein in urine were within normal range	No Treatment given
		Glucose in urine	Negative	Negative	Glucose in urine were within normal range	No Treatment given
		Ketones in urine	Negative	Negative	Ketones in urine were within normal range	No Treatment given
		Blood in urine	Negative	Negative	Blood in urine were with normal range	No Treatment given
		pH	7.5	5.5-8.1	Urine pH is within normal range	No Treatment given
		Appearance	Hazy	Amber	Appearance of urine was within normal range	No treatment given

2.1.2. Causes of the Patient Illness

With reference to the literature review on the causes of sickle cell and the diagnostic investigations carried out on Miss B.S. the cause of the illness is genetics but precipitating factors that could aggravate her condition could be infection and extreme exposure to cold weather.

2.1.3. Clinical Manifestation

Table 2.4: Comparison of Clinical Manifestation Exhibited by Miss B.S. as Compared with Literature Review

Clinical Manifestation in Literature Review	Clinical Manifestation Presented by Miss B.S.
1. Weakness and fatigue	1. Patient experienced weakness and fatigue
2. Headache	2. Patient experienced headache
3. Dizziness or light-headedness	3. Patient had no dizziness
4. Yellowing of the skin and eyes (jaundice)	4. Patient experienced mild jaundice
5. Swelling in the hands and feet	5. Patient hand and feet were not swollen
6. Anemia	6. Patient had mild anemia
7. Chest pain and shortness of breath	7. Patient did not complain of chest pain shortness of breath.
8. Frequent infections	8. Patient had an infection
9. Vision problems	9. Patient's vision was not affected
10. Episodes of pain	10. Patient complained of pains
11. Joint pain	11. Patient complained of joint pain
12. Edema	12. Edema was not experienced by patient

From table 2, it indicated that Miss B.S. presented with most of the clinical manifestations as indicated in the literature review.

2.1.4 Treatment given to patient.

According to Pitone (2022), treatment is something that health care providers do for their parents to control a health problem, lessen its symptoms or clear it up. Treatment for sickle cell disease as indicated in the literature review are as follows;

1. Analgesics examples morphine, and ibuprofen given to alleviate pain of vaso-occlusive crisis and anti-pyretics for temperature.
2. Vitamin supplements such as Folic acid, Vitamin B-complex and Fersolate to boost appetite and prevent anemia
3. Antibiotics like Cefuroxime, cefataxine, cerfezidime, ceftriaxone and ciprofloxacin
4. Intravenous normal saline and dextrose saline are often prescribed to correct fluid and electrolytes imbalance, reduce blood viscosity and prevent vaso – occlusive crisis.
5. Oxygen therapy is given to prevent hypoxemia.
6. Blood transfusion may be necessary in cases of sickle cell anemia.

Based on the clinical manifestations presented by Miss B.S. and the laboratory investigations conducted, the following drugs were prescribed and administered to her;

1. Intravenous normal Saline 0.9% 2 litre for 24 hours
2. Pethidine injection 50mg/ml in 2ml stat.
3. Tablet morphine sulphate 10mg tds for 5 days.
4. Tablet cefuroxime 250mg bd for 5days.

5. Tablet paracetamol 1gram tds for 7 days
6. Tablet folic acid 5mg for 1daily
7. Intravenous cefuroxime injection 750 mg tds for 1 day.
8. Dextrose in Sodium Chloride 5% in 0.9% (500ml) 1L

Table 2.5: Comparison of Treatment Administered to Miss B.S. with Standard

Treatment stated in Literature	**Treatment Administered to Patient**
1. Analgesics examples morphine, and ibuprofen	1. Tablet morphine, tablet paracetamol and injection pethidine were administered
2. Vitamin supplements such as Folic acid, Vitamin B-complex and Fersolate	2. Tablet folic acid was administered
3. Antibiotics like Cefuroxime, cefataxine, cerfezidime, ceftriaxone and ciprofloxacin	3. IV cefuroxime and tablet cefuroxime were administered
4. Intravenous normal saline and dextrose saline	4. IV normal saline and IV dextrose in sodium chloride were administered
5. Oxygen therapy	5. No oxygen therapy was done
6. Blood transfusion may be necessary in cases	6. Blood transfusion was not required

With reference to the literature review of drug treatment, patient was treated with most of the drugs which includes; Intravenous normal Saline, pethidine injection, tablet morphine sulphate, tablet cefuroxime, tablet folic acid, Intravenous cefuroxime injection, tablet paracetamol and dextrose in Sodium Chloride. This shows that, patient's treatment was in line with the treatment of sickle cell disease as indicated in the literature review.

Table 2.6: Pharmacology of Drugs/Conservative Treatment Given to Miss B.S.

Date	Drug	Dosage/ Route of Administration (Literature)	Dosage/ Route of administration given to patient	Classification	Desired Effect	Actual Action Observed	Side Effect/ Remedies	Remarks
7/12/2022	Pethidine	**Dosage:** Adult: 50-100mg 4 hourly Pediatrics: 25-100mg **Route:** orally, intramuscularly and intravenously	50mg/ml in 2ml stat Intravenously	Opioid (narcotic) analgesics	It binds to the opioid receptors and exerts its principal pharmacological actions on the CNS where its analgesics and sedative effects are of particular therapeutic value.	Patient was relieved from pains.	Tremors, twitches, seizure, dizziness, constipation, lightheaded, nausea and vomiting.	No side effect was experienced.

Table 2.7: Pharmacology of Drugs/Conservative Treatment Given to Miss B.S.

Date	Drug	Dosage/ Route of Administration (Literature)	Dosage/ Route of administration given to patient	Classification	Desired Effect	Actual Action Observed	Side Effect/ Remedies	Remarks
7/12/2022	Morphine	**Dosage:** Adult: 5-10mg 4 hourly Pediatrics: 200-300mcg **Route:** orally, subcutaneously intramuscularly and intravenously	10mg tds x 5 days Orally	Opioid (narcotic) analgesics	It acts on the receptors located on neuronal cell membranes. The presynaptic action of opioids to inhibit neurotransmitter release is considered to be their major effect in the nervous system	Patient was relieved from pains.	Agitation, bronchospasm, hypotension, ileus, mood altered.	No side effect was experienced.

Table 2.8: Pharmacology of Drugs/Conservative Treatment Given to Miss B.S.

Date	Drug	Dosage/ Route of Administration (Literature)	Dosage/ Route of administration given to patient	Classification	Desired Effect	Actual Action Observed	Side Effect/ Remedies	Remarks
7/12/2022	Normal Saline	Amount depends on patient's fluid and electrolyte level and age as well as doctor's prescription **Route:** Intravenously	1liter for 24 hours Intravenously	Isotonic solution of sodium chloride	To correct dehydration and it's also associated with increased sickle red cell stiffness and prolonged transit times in microfluidic model of capillary system.	Patient was hydrated and was relieved of joint pains	Pulmonary oedema, venous thrombosis, circulatory over load and hypocalcemia	No side effect was experienced

Table 2.9: Pharmacology of Drugs/Conservative Treatment Given to Miss B.S.

Date	Drug	Dosage/ Route of Administration (Literature)	Dosage/ Route of administration given to patient	Classification	Desired Effect	Actual Action Observed	Side Effect/ Remedies	Remarks
7/12/2022	Tablet folic acid	**Dosage:** Adult: 400mcg daily Paediatrics: 1mg daily **Route:** Orally	5mg daily x 30days Orally	Hematinic	Helps in the production of new Red Blood Cells and used for the treatment of iron deficiency anaemia.	Patient blood levels raised	Malaise, rash, slight flushing and pruritus	No side effect was experienced

Table 2.10: Pharmacology of Drugs/Conservative Treatment Given to Miss B.S.

Date	**Drug**	**Dosage/ Route of Administration (Literature)**	**Dosage/ Route of administration given to patient**	**Classification**	**Desired Effect**	**Actual Action Observed**	**Side Effect/ Remedies**	**Remarks**
7/12/2022	Dextrose 5%	Amount depends on patient's fluid and electrolyte level and age as well as doctor's prescription **Route:** Intravenously	1liter for 24 hours Intravenously	Glucose-Elevating Agents	To correct dehydration and low blood sugar levels.	Patient was hydrated	Headache, bluish color, rapid breathing, fast or slow heartbeat	No side effect was experienced

Table 2.11: Pharmacology of Drugs/Conservative Treatment Given to Miss B.S.

Date	Drug	Dosage/ Route of Administration (Literature)	Dosage/ Route of administration given to patient	Classification	Desired Effect	Actual Action Observed	Side Effect/ Remedies	Remarks
7/12/2022	Paracetamol	**Dosage:** Adult dosage: 650-1000mg every 6-8hours Children dosage; 10-15mg/kg body weight every 4-6hours. **Route:** Orally, Rectal, intravenously	1gram tds x 7 days Orally	Analgesic, anti-inflammatory and anti-pyretic.	To relieve pain and fever by inhibiting prostaglandin synthesis in the nervous system.	Pain and fever reduced gradually.	Dark urine, clay-coloured stools, breathing difficulties and liver toxicity.	No side effect was experienced

Table 2.12: Pharmacology of Drugs/Conservative Treatment Given to Miss B.S.

Date	Drug	Dosage/ Route of Administration (Literature)	Dosage/ Route of administration given to patient	Classification	Desired Effect	Actual Action Observed	Side Effect/ Remedies	Remarks
7/12/2022	Cefuroxime	**Dosage:** Adult: Tablet: 125mg-250mg Intravenous: 500mg-750mg Paediatrics: 30mg/kg daily **Route:** Orally, intravenously	Tablet: 250mg bd for 5days Intravenous: 750 mg tds for 1 day	Cephalosporins, Second-Generation	It is used to treat bacterial infections. It works by killing bacteria or preventing their growth	Patient's white blood cell count was reduced to normal range.	Feeling of discomfort, tarry stools, fever, cough	No side effect was experienced

2.1.5. Complication

With reference to the literature review, the complications of sickle cell disease include; stroke, acute chest syndrome, pulmonary hypertension, organ damage, splenic sequestration, blindness, leg ulcer, gallstones, priapism, deep vein thrombosis and pregnancy complications. None of these complications were experienced by patient.

2.2 Patient/Family strengths

Strength is the ability to do things that need lot of physical or mental effort (Cambrigde advanced learner's dictionary, 2023). Patient and family strengths refers to the resources that can enable them to cope with stressful conditions leading to patient's recovery. These involve the activities that contribute to the well-being of patient and her family as well as her speedy recovery. The following were identified during the assessment phase as Miss B.S and family's strength;

1. Patient could verbalize the intensity of the pain (7/12/2022).
2. Patient reports fever (7/12/2022)
3. Patient could walk from her bed to the Nurses' station and back (7/12/2022).
4. Patient could eat 70mls of porridge served (8/12/2022)
5. Patient could sleep for 2 hours at night and an hour during the day (8/12/2022)
6. Patient and mother verbalized two precipitating factors of the condition (9/12/2022)

2.3 Patient/family health problems

Problem is defined as a situation, person that needs attention and needs to be dealt with or solved (Cambrigde advanced learner's dictionary, 2023). These are the problems or factors that affect the patient physically, mentally, socially and spiritually that can hinder her speedy recovery.

From the data collected during assessment, the following health problems were noticed on patient;

1. Patient complained of joint pains (7/12/20220)
2. Patient had fever (38.0^{o}C) (7/12/2022)
3. Patient has difficulty walking (7/12/2022)
4. Patient complained of loss of appetite (8/12/2022)
5. Patient had difficulties sleeping after awakening (8/12/2022)
6. Patient and mother has little knowledge about the condition (Sickle cell disease) (9/12/2022)

2.4 Nursing Diagnoses

According to NANDA International, nursing diagnosis is a clinical judgment concerning a human response to health conditions/life processes, or vulnerability for that response, by an individual, family, group, or community (Herdman & Kamitsuru, 2018). These nursing diagnoses were formulated based on the health problems that were identified on Miss B.S.

1. Acute pain related to vaso-occlusive crisis as evidenced by complains of joint pains and self-rating of pain as “8” on the numerical pain rating scale (7/12/2022)
2. Hyperthermia related to sepsis as evidenced by skin warm to touch (7/12/2022)
3. Impaired walking related to joint pains secondary to vaso-occlusive crisis as evidenced by impaired ability to walk required distance and fatigue (7/12/2022)
4. Imbalanced nutrition: less than body requirement related to inadequate dietary intake as evidenced by poor appetite for food (8/12/2022)
5. Insomnia related to pain as evidenced by early awakening and difficulty maintain sleep state (8/12/2022).

6. Knowledge deficit (patient and mother) related to lack of adequate information on the causes, clinical manifestation and management of sickle cell disease (9/12/2022).

CHAPTER THREE

PLANNING FOR PATIENT AND FAMILY CARE

3.0 Introduction

Planning is where goals and outcomes are formulated that directly impact patient care based on Educational Development Plan (EDP) guidelines. These patient-specific goals and the attainment of such assist in ensuring positive outcome. Nursing care plans are essential in this phase (Tammy & Jennifer, 2022). Planning involves writing of the nursing care plan and it is the third phase of the nursing process. Nursing diagnosis is used to formulate a plan on how the patient will be cared for. Planning includes setting of priorities, goals, objectives/outcome criteria and outlining the care strategies in the nursing care plan. In writing the plan of care, objectives/outcome criteria must tally with nursing diagnosis and must be arranged in order of importance.

3.1 Objectives /Outcome Criteria for Patient/Family Care

After priorities of the nursing diagnosis have been established, goals and nursing action appropriate for attaining the goals are identified. The patient and his/her family are included in the establishment of goals for the nursing actions. The goal is the desired outcome of the nursing intervention and the outcome is the expected change in the patient status. Outcome criteria and statements that describe specific, observable and measurable responses of the patient. They determine whether the goals have been achieved and they are essential tools in evaluation.

The following are some of the nursing objectives and outcome criteria formulated for patient/family care;

1. Patient will be relieved of pains within 24hours as evidenced by;

a. Patient rating pain as “2” or below on the numerical rating scale

b. Nurse visualizing patient ambulating without pain

2. Patient will regain her normal body temperature within 48 hours as evidenced by;

a. Patient verbalizing that she has no more fever

b. Nurse recording an axillary temperature ranging from 36.2^{o}c to 37.2^{o}c

3. Patient will regain her ability to walk within 48 hours as evidenced by;

a. Patient verbalizing relief of pain and fatigue

b. Nurse observing patient walking from the bed to the bathroom, nurses’ station and back

4. Patient’s normal nutritional pattern will be restored throughout the period of hospitalization as evidenced by;

a. Patient verbalizing, she has regained her appetite

b. Nurse visualizing patient consuming ¾ of every meal served.

5. Patient will regain her normal sleep pattern within 48hours as evidenced by;

a. Mother verbalizing patient can sleep normally.

b. Nurse observing patient sleep for 6hours at night and at daytime nap of at least 1hour.

6. Patient and mother will attain adequate knowledge on patient’s condition (sickle cell disease); causes, its treatment and management within 24hours as evidenced by;

a. Patient and mother demonstrating the measures to manage sickle cell disease.

b. Nurse observing patient and mother asking questions to seek for clarification about the condition.

Table 3.1: Nursing Care Plan for Miss B.S. and Family

Date and Time	Nursing Diagnosis	Objective/Outcome Criteria	Nursing orders	Nursing Interventions	Date and Time	Evaluation	Sign
7/12/2022 At 10:10am	Acute pain related to vaso-occlusive crisis as evidenced by complains of joint pains and self-rating of pain as "8" on the numerical pain rating scale	Patient will be relieved of pains within 24hours as evidenced by; a. Patient rating pain as "2" or below on the numerical rating scale. b. Nurse visualizing patient ambulating without pain	1. Reassure patient that measures such as ensuring rest and administering of drugs will be put in place to relieve her pain 2. Assess patient's level of pain using the numerical pain rating scale. 3. Provide a warm comfortable bed and blanket. 4. Encourage patient on the intake of warm drinks and fluids. 5. Engage patient in diversional activities.	1. Patient was reassured that, measures such as ensuring rest and administering of drugs will be put in place to relieve her pains 2. Patient's level of pain was assessed and patient rated it as 8 on the numerical pain rating scale of 0-10 3. A warm comfortable bed with warm blankets was provided for her to ensure rest 4. Patient was encouraged to take in warm and adequate fluid 5. Patient was engaged in diversional activities such as listening to music.	8/12/2022 At 10:10am	Goal fully met as; a. Patient rated her pain as 2 on the numerical rating scale b. Nurse visualizing patient ambulate without complains of pain	O.P.C.

Table 3.1: Nursing Care Plan for Miss B.S. and Family continue

Date and Time	Nursing Diagnosis	Objective/Outcome Criteria	Nursing orders	Nursing Interventions	Date and Time	Evaluation	Sign
			6. Administer prescribed intravenous fluids. 7. Administer prescribed analgesics	6. Prescribed intravenous fluids such as 2 litres of Normal saline was administered to flush rigid sticky sickled RBCs and restore microcirculation. 7. Prescribed pethidine 50mg in was administered to relieve her pain			O.P.C.

Table 3.2: Nursing Care Plan for Miss B.S. and Family continue

Date and Time	Nursing Diagnosis	Objective/Outcome Criteria	Nursing orders	Nursing Interventions	Date and Time	Evaluation	Sign
7/12/2022 At 10:10am	Hyperthermia related to sepsis as evidenced by skin warm to touch	Patient will regain her normal body temperature within 48 hours as evidenced by; a. Patient verbalizing that she has no more fever. b. Nurse recording an axillary temperature ranging from 36.2^{o}c to 37.2^{o}c	1. Reassure patient and mother that measures will be taken to reduce fever. 2. Monitor axillary temperature every 15-20 minutes. 3. Tepid sponge patient every 15-20 minutes until axillary temperature falls below 38.0^{o}c 4. Serve cold fluids 5. Keep louvers open to provide ventilation 6. Administer prescribed antipyretics	1. Patient and her mother were reassured that fever control measures were being instituted to control fever 2. Axillary temperature was monitored and read 37.0^{o}c on evaluation 3. Patient was tepid sponged and sheets were changed afterwards 4. Patient was served with cold “Malt” and water 5. Louvers were kept open to ensure adequate ventilation. 6. 1g of tablet paracetamol was administered.	9/12/2022 At 10:10am	Goal fully met as; a. Patient verbalized she has fever no more b. Nurse recording an axillary temperature of 37.0^{o}c	O.P.C.

Table 3.3: Nursing Care Plan for Miss B.S. and Family continue

Date and Time	Nursing Diagnosis	Objective/Outcome Criteria	Nursing orders	Nursing Interventions	Date and Time	Evaluation	Sign
7/12/2022 At 11:00am	Impaired walking related to joint pains secondary to vaso-occlusive crisis as evidenced by impaired ability to walk required distance and fatigue	Patient will regain her ability to walk within 48 hours as evidenced by; a. Patient verbalizing relief of pain and fatigue. b. Nurse observing patient walking from the bed to the bathroom, nurses' station and back	1. Assess patient's ability to walk 2. Encourage patient to take copious fluid 3. Encourage patient to take nutritious diet rich in carbohydrate, protein and iron 4. Encourage patient to have enough rest. 5. Administer prescribed hematinic 6. Manage patient's pain.	1. Patient's ability to walk was assessed. Patient walked from bed to nurses' station and later from bed to the bathroom and back. 2. Patient was encouraged to take 8 cups of copious fluid to prevent dehydration 3. Patient was served with nutritious diet rich in calories, proteins and iron to increase her energy level 4. A comfortable bed free from creases and cramps was made to ensure adequate rest 5. Tablet folic acid 5mg daily was administered. 6. Patient's pain was managed with diversional therapy and tablet morphine 10mg. Patient also reported measure of pain management.	9/12/2022 At 11:00am	Goal fully met as; a. Patient verbalized the relief of pain and fatigue b. Nurse observed patient walk from the bathroom, nurses' station and back.	O.P.C.

Table 3.4: Nursing Care Plan for Miss B.S. and Family continue

Date and Time	Nursing Diagnosis	Objective/Outcome Criteria	Nursing orders	Nursing Interventions	Date and Time	Evaluation	Sign
8/12/2022 At 8:30am	Imbalanced nutrition: less than body requirement related to inadequate dietary intake as evidenced by poor appetite for food	Patient's normal nutritional pattern will be restored throughout the period of hospitalization as evidenced by; a. Patient verbalizing, she has regained her appetite. b. Nurse visualizing patient consuming ¾ of every meal served.	1. Reassure patient that her normal eating pattern will be restored. 2. Perform oral hygiene 3. Involve patient/ family in planning of her diet and serve patient's food at right intervals (3-4 times) daily. 4. Serve food attractively and provide a pleasant environment during meals. 5. Serve patient's favourite meals to stimulate her appetite and encourage feeding.	1. Patient was reassured restoring her normal eating pattern. 2. Patient brushed her teeth twice daily and mouth rinsed before and after meals. 3. Patient was always asked about the food he will like to eat and food was served at right intervals (3-4 times) daily. 4. The environment was always kept neat and free from nauseated substances such as vomits, urine, stool and dirty linen. 5. Patient's favorite meals (rice and stew) was prepared and served.	11/12/2022 At 8:30am	Goal fully met as; a. Patient verbalized that she had gained her appetite. b. Nurse observed that patient consumed ¾ of rice and stew served.	O.P.C.

Table 3.5: Nursing Care Plan for Miss B.S. and Family continue

Date and Time	Nursing Diagnosis	Objective/Outcome Criteria	Nursing orders	Nursing Interventions	Date and Time	Evaluation	Sign
8/12/2022 At 9:00am	Insomnia related to pain as evidenced by early awakening and difficulty maintain sleep state	Patient will regain her normal sleep pattern within 48hours as evidenced by; a. Mother verbalizing patient can sleep normally. b. Nurse observing patient sleep for 6hours at night and a daytime nap of at least 2hours	1. Assess patient's sleep pattern. 2. Encourage regular evening routine that promote sleep. 3. Make sure there is no noise at the ward. 4. Prepare and make a comfortable bed for patient to ensure quality sleep. 5. Plan sleep and activity periods. 6. Assess patient each night and morning to determine the quality of sleep she had.	1. A complete history of patient's sleep was obtained which indicated that patient sleeps for at least 6hours normal and a daytime nap of 1hour. 2. Bathing, urinating and toileting before going to bed were performed for the patient. 3. The ward was kept calm and conducive for sleeping. 4. A simple warm occupied bed free from creases and cramps was made for patient for to ensure a comfortable sleep. 5. A plan was developed for patient to sleep that is she was to sleep for 6hours at night uninterrupted and 1hour during the day. 6. On assessment it showed that, patient sleeps for 6hours at night and an hour during the day.	10/12/2022 At 9:00am	Goal fully met as; a. Relative verbalized patient could sleep well at night and during the day. b. Nurse observed patient sleeping for 6hours at night and 1hour during the day.	O.P.C.

Table 3.6: Nursing Care Plan for Miss B.S. and Family continue

Date and Time	Nursing Diagnosis	Objective/Outcome Criteria	Nursing orders	Nursing Interventions	Date and Time	Evaluation	Sign
9/12/2022 At 10:00am	Knowledge deficit (patient and mother) related to lack of adequate information on the causes, clinical manifestation and management of sickle cell disease	Patient and mother will attain adequate knowledge on patient's condition (sickle cell disease); causes, its treatment and management within 24hours as evidenced by; a. Patient and mother demonstrating the measures to manage sickle cell disease. Nurse observing patient and mother asking questions to seek for clarification about the condition	1. Reassure patient and her mother of acquiring much information about SCD; causes, clinical manifestation and management. 2. Assess motivation and willingness of patient and family to learn. 3. Adjust teaching according to level of understanding, educational background and learning styles for the patient and relative.	1. Patient and mother were reassured of gaining enough knowledge on SCD; causes, clinical manifestation and its management. 2. Patient and mother's motivation and willingness to learn was assessed by observing their level of concentration. Teaching was adjusted to the level of understanding, educational background and learning style of the patient and relative by dividing the topic in subtopics and explaining them into details for maximum understanding before moving to the next subtopic.	10/12/2022 At 10:00am	Goal fully met as; a. Patient and mother verbalized the causes, management and complications of SCD. Nurse observed patient and mother asked enough questions to clarify their doubt about SCD.	O.P.C.

Table 3.6: Nursing Care Plan for Miss B.S. and Family continue

Date and Time	Nursing Diagnosis	Objective/Outcome Criteria	Nursing orders	Nursing Interventions	Date and Time	Evaluation	Sign
			4. Establish good interpersonal relationship with patient and relative. 5. Educate patient and family about the clinical manifestation and management of SCD. 6. Encourage patient and mother to ask questions bothering their mind and answer the questions tactfully. 7. Assess the patient and mother on what has been taught	3. Good interpersonal relationship was established with patient and her mother to facilitate the learning process 4. Patient and relative were educated on the clinical manifestation, precipitating factors and management of SCD. 5. Patient and relative were encouraged to ask questions bothering their mind and answers were provided tactfully in the language they understand. 6. Patient and her mother correctly verbalized the causes, management, and complications of SCD just as they were taught.			O.P.C.

CHAPTER FOUR

IMPLEMENTATION OF PATIENT/FAMILY CARE PLAN

4.0 Introduction.

The implementation phase of the nursing process involves carrying out the proposed plan of nursing care. The nurse assumes responsibility for the implementation and coordinates the activities of all those involved in implementation, including the patient and family, other members of the nursing team and other members of the health care team, so that the schedule of activities facilitates the patient's recovery (Hinkle, & Cheever, 2017). This chapter is the fourth phase of the patient and family care study and it involves a summary of the actual nursing interventions rendered. This is where the objectives set and nursing orders given are really put in to practice with the purpose of aiding in patient recovery and getting over a health problem. It formally begins after the nurse develops a plan of care. It also includes the nursing care rendered on daily basis, preparation of patient and family towards discharge, continuity of care or home visits and rehabilitation. It also involves putting the nursing care plan which includes both medical and nursing interventions into action in order to obtain the desired outcome criteria of the patient.

4.1 Summary of Actual Nursing Care Rendered to Patient and Family

The actual nursing care rendered to patient and her family started on the day of admission 7th December, 2022 to the time care was terminated. The aim of management was to meet patient and family's psychological, physiological, emotional, spiritual needs, avoid complications and to ensure early recovery of patient.

First Day of Admission 7th December, 2022

Miss B.S. was admitted into the female medical ward of Municipal Hospital, Sunyani per ambulation accompanied by a student nurse and her mother in a conscious state on 7th December, 2022 around 10:00am with the diagnosis of sickle cell disease with vaso-occlusive crisis on referral from the emergency unit. They were welcomed to the nurses' station and seats were offered to them; I took over the patient from the student nurse as she handed over. Patient was made comfortable in an admission bed which was already made for her. On admission she complained of joint pains and general body weakness. On examination and observation, she was conscious and alert but was feverish (38.0^{o}c) and mother looked anxious. Patient was made comfortable in bed and her vital signs were checked and recorded as;

1. Temperature 38.0 degree Celsius
2. Pulse 98 beats per minute
3. Respiration 21 cycles per minutes
4. Blood Pressure 130/86mmHg

Patient's weight on admission was 30kg. Patient and mother were introduced to the staff nurses present and were assured of the competence of the health workers (nurses and doctors) who were going to take care of her throughout her stay at the hospital. The following information was obtained; patient's name, age, religion, address and allergies. The particulars taken were then entered into the admission and discharge book and in the daily ward state. Patient's mother was oriented to the ward, its annexes and the activities that goes on in the ward like visiting hours, time for medication and the time for checking vital signs. They were informed to bring items patient would need while she was on admission such as plates, cup, bowl, spoon, tissue paper, bathing

soap, tooth brush and tooth paste, towel, sponge, bucket, adult diapers and comb. I introduced myself to patient and mother as a final year student of Holy Family Nursing and Midwifery Training College, Berekum who would like to take her and her family for as a care study. Miss B.S. and mother were informed that the care study is a requirement by the Nursing and Midwifery Council of Ghana in partial fulfillment towards the award of a license to practice as a Registered General Nurse. I explained to patient and mother the concept of the patient/family care study and assured them of privacy and confidentiality. It was added that a report will be written after the entire event and will visit their home while still on admission and when she is been discharged home. Patient and her mother agreed to my request and promised to offer me the necessary information and assistance. I however, congratulated them on such a decision since doing so revealed a mark of a welcoming gesture. Hospital policies regarding visiting periods, payment of bills and the time vital signs will be checked were explained.

Discharged planning was initiated with the relative; thus, she will continue to care for patient (administering medication, making sure patient sleeps in treated mosquito net at home once she is well and discharged, eating hygienic and abiding by the education given to them on diet management). Patient was managed with;

1. Intravenous normal Saline 0.9% 2 liter for 24 hours
2. Pethidine injection 50mg/ml in 2ml stat.
3. Tablet morphine sulphate 10mg tds for 5 days.
4. Tablet cefuroxime 250mg bd for 5days.

5. Tablet paracetamol 1gram tds for 7 days

6. Tablet folic acid 5mg for 1daily x 30days

7. Intravenous cefuroxime injection 750 mg tds for 1 day.

8. Dextrose in Sodium Chloride 5% in 0.9% (500ml) 1L x 24hours

Drugs were collected from the pharmacy since patient is a National Health Insurance Scheme (NHIS) beneficiary. The following diagnostic investigations were requested and done for patient;

1. Blood for malaria parasites.

2. Blood for full blood count.

3. Urine Routine Examination.

At 10:10am, due to patient's complain of pains in the joints, a nursing diagnosis of Acute pain related to vaso-occlusive crisis as evidenced by complains of joint pains and self-rating of pain as "8" on the numerical pain rating scale was formulated. An objective of patient will be relieved of pains within 24hours as evidenced by patient rating pain as "2" or below on the numerical rating scale and Nurse visualizing patient ambulating without pain was set. Nursing interventions implement to achieve these objectives are as follows; patient was reassured that, measures such as ensuring rest and administering of drugs will be put in place to relieve her pains, patient's level of pain was assessed and patient rated it as 8 on the numerical pain rating scale of 0-10, A warm comfortable bed with warm blankets was provided for her to ensure rest, patient was encouraged to take in warm and adequate fluid, patient was engaged in diversional activities such

as listening to music, prescribed intravenous fluids such as 2 litres of Normal saline was administered to flush rigid sticky sickled RBCs and restore microcirculation and prescribed pethidine 50mg in was administered to relieve her pain.

At 10:10am, patient had fever (38.0^{o}C) therefore a nursing diagnosis of Hyperthermia related to sepsis as evidenced by skin warm to touch was formulated. An objective of patient will regain her normal body temperature within 48 hours as evidenced by; Patient verbalizing that she has no more fever and Nurse recording an axillary temperature ranging from 36.2^{o}c to 37.2^{o}c was set. Nursing interventions implemented includes; Patient and her mother were reassured that fever control measures were being instituted to control fever, Axillary temperature was monitored and read 37.0^{o}c on evaluation, Patient was tepid sponged and sheets were changed afterwards, Patient was served with cold "Malt" and water, Louvers were kept open to ensure adequate ventilation and 1g of tablet paracetamol was administered.

At 11:00am, patient reported of having difficulty walking, a nursing diagnosis of Impaired walking related to joint pains secondary to vaso-occlusive crisis as evidenced by impaired ability to walk required distance and fatigue was formulated. An objective of patient will regain her ability to walk within 48 hours as evidenced by; Patient verbalizing relief of pain and fatigue and Nurse observing patient walking from the bed to the bathroom, nurses' station and back was set. Nursing interventions implemented are as follows; Patient's ability to walk was assessed. Patient walked from bed to nurses' station and later from bed to the bathroom and back, Patient was encouraged to take 8 cups of copious fluid to prevent dehydration, Patient was served with nutritious diet rich in calories, proteins and iron to increase her energy level, A comfortable bed free from creases and cramps was made to ensure adequate rest, Tablet folic acid 5mg daily was

administered and Patient's pain was managed with diversional therapy and tablet morphine 10mg. Patient also reported measure of pain management.

At 2:00pm, patient's vital signs were checked and recorded as indicated in the appendix. Patient was served with mashed kenkey and bread for lunch of which she ate 1/4th of the meal served.

At 6:00pm, patient's vital signs were checked and recorded and due medication were administered. She was served with rice and stew for supper. Patient was assisted to perform her personal hygiene and was made comfortable in bed.

At 10:00pm, patient's vital signs were checked and recorded. Patient went to bed at 10:20pm.

Second Day of Admission 8th December, 2022

On the second day of admission, Miss B.S. woke up around 5:10am. At 5:30am, Miss B.S. took her bath and brushed her teeth. At 6:00am, patient's vital signs were checked and recorded as indicated in the appendix and due medications were administered. At 8:10am, patient was served with rice porridge and bread for breakfast of which she ate about three teaspoons of the rice porridge.

At 8:30am, patient was reviewed by the medical officer on duty during ward rounds. Miss B.S. was examined and she complained of loss of appetite and difficulties sleeping.

At 8:30am, patient complained of loss of appetite, therefore a nursing diagnosis of Imbalanced nutrition: less than body requirement related to inadequate dietary intake as evidenced by poor appetite for food was formulated. An objective of Patient's normal nutritional pattern will be restored throughout the period of hospitalization as evidenced by; Patient verbalizing, she has regained her appetite and Nurse visualizing patient consuming ¾ of every meal served was set.

Nursing interventions implemented include; Patient was reassured restoring her normal eating pattern, Patient brushed her teeth twice daily and mouth rinsed before and after meals, Patient was always asked about the food he will like to eat and food was served at right intervals (3-4 times) daily, the environment was always kept neat and free from nauseated substances such as vomits, urine, stool and dirty linen and Patient's favorite meals (rice and stew) was prepared and served.

At 9:00am, Miss B.S. complained of having difficulties sleeping after awakening, a nursing diagnosis of Insomnia related to pain as evidenced by early awakening and difficulty maintain sleep state was formulated. An objective of patient will regain her normal sleep pattern within 48hours as evidenced by; Mother verbalizing patient can sleep normally and Nurse observing patient sleep for 6hours at night and a daytime nap of at least 2hours was set. Nursing interventions implemented includes; A complete history of patient's sleep was obtained which indicated that patient sleeps for at least 6hours normal and a daytime nap of 1hour, Bathing, urinating and toileting before going to bed were performed for the patient, The ward was kept calm and conducive for sleeping, A simple warm occupied bed free from creases and cramps was made for patient for to ensure a comfortable sleep, A plan was developed for patient to sleep that is she was to sleep for 6hours at night uninterrupted and 1hour during the day and On assessment it showed that, patient sleeps for 6hours at night and an hour during the day.

At 10:00am, patient's vital signs were checked and recorded, due medication was administered.

At 10:10am, the objective set on 7th December, 2022 to relieve patient of joint pains was evaluated and goal was fully met as; Patient rated her pain as 2 on the numerical rating scale and Nurse visualizing patient ambulate without complains of pain.

At 2:00pm, vital signs were checked and recorded. Patient was served with mashed kenkey and bread for lunch.

At 6:00pm, patient's vital signs were checked and recorded and due medication were administered. She was served with ampesi and palava sauce for supper. Patient performed her personal hygiene and was made comfortable in bed.

At 10:00pm, patient's vital signs were checked and recorded. She went to bed at 10:20pm.

Third Day of Admission 9th December, 2022

Miss B.S. woke up around 5:00am and performed her personal hygiene. Her bed linens were removed and changed with clean ones to make her comfortable in bed. At 6:00am, her vital signs were checked and recorded and her due medications administered. At 7:30am, she was served with porridge with bread for breakfast and patient ate more than half indicating sign of improvement in her appetite at 8:30am.

At 9:00am, the doctor on duty conducted ward round. Patient was examined and did not have any new complaint.

At 10:00am, patient's vital signs were checked and recorded.

At 10:00am, upon conversation and observations made on patient and mother, it was realized that they had little knowledge about the condition (sickle cell disease), a nursing diagnosis of Knowledge deficit (patient and mother) related to lack of adequate information on the causes, clinical manifestation and management of sickle cell disease was formulated. An objective of patient and mother will attain adequate knowledge on patient's condition (sickle cell disease); causes, its treatment and management within 24hours as evidenced by; Patient and mother

demonstrating the measures to manage sickle cell disease and Nurse observing patient and mother asking questions to seek for clarification about the condition was set. Nursing interventions implemented are as follows; Patient and mother were reassured of gaining enough knowledge on SCD; causes, clinical manifestation and its management, Patient and mother's motivation and willingness to learn was assessed by observing their level of concentration, Teaching was adjusted to the level of understanding, educational background and learning style of the patient and relative by dividing the topic in subtopics and explaining them into details for maximum understanding before moving to the next subtopic, Good interpersonal relationship was established with patient and her mother to facilitate the learning process, Patient and relative were educated on the clinical manifestation, precipitating factors and management of SCD, Patient and relative were encouraged to ask questions bothering their mind and answers were provided tactfully in the language they understand and Patient and her mother correctly verbalized the causes, management, and complications of SCD just as they were taught.

At 10:10am, the objective set on 7th December, 2022 for patient to record a normal body temperature ranging from 36.2^{o}c to 37.2^{o}c" was evaluated and goal was fully met as; Patient verbalized she has fever no more and Nurse recorded an axillary temperature of 37.0^{o}c.

At 11:00am, the objective set on 7th December, 2022 for patient to regain her ability to walk within 48 hours was evaluated and goal was fully met as patient verbalized the relief of pain and fatigue and Nurse observed patient walk from bedside to the bathroom without any challenges.

At 12:30pm, I went for my first home visit. At 1:20pm, patient was served with fried yam with hot pepper for lunch. She ate 3/4th of the meal indicating improvement in her appetite.

At 2:00pm, patient's vital signs were checked and recorded. Due medications were administered. Miss B.S. took her bath at 5:40pm.

At 6:00pm, patient's vital signs were checked and recorded and due medications were administered. At 6:20pm, she was served with rice with light soup for supper. Patient performed her personal hygiene and was made comfortable in bed.

At 10:00pm, patient's vital signs were checked and recorded. Patient went to bed at 10:20pm.

Fourth Day of Admission 10th December, 2022

Miss B.S. woke up in the morning around 5:20am, emptied her bowel and bladder. She performed her personal hygiene and her bed linen was changed and replaced by a clean linen. At 6:00am, her vital signs checked and recorded as indicated in the appendix. At 8:00am, patient was served tea with bread for breakfast. She was able to eat all the meal served. Due medication was administered. She was then reviewed by the House officer during ward rounds and Miss B.S. had no new complains. She was asked to continue with her medication. She was also told that, she would be discharged the next day if there were no further complains.

At 9:00am, the objective set on 8th December, 2022 "Patient will regain her normal sleep pattern within 48hours as evidenced by; Mother verbalizing patient can sleep normally and Nurse observing patient sleep for 6hours at night and a daytime nap of at least 2hours" was evaluated and goal was fully met as Relative verbalized patient could sleep well at night and during the day and Nurse observed patient sleeping for 6hours at night and 1hour during the day.

At 10:00am, the objective set on 9th December, 2022 "Patient and mother will attain adequate knowledge on patient's condition (sickle cell disease); causes, its treatment and management within 24hours as evidenced by; Patient and mother demonstrating the measures to manage

sickle cell disease and Nurse observing patient and mother asking questions to seek for clarification about the condition" was evaluated and goal was fully met as Patient and mother verbalized the causes, management and complications of SCD and Nurse observed patient and mother asked enough questions to clarify their doubt about SCD.

Patient's vital signs were checked and recorded at 10:00am.

At 2:00pm, patient's due medications were administered and vital signs were checked and recorded. She was served with malt and pie for lunch.

Miss B.S. took her bath at 5:00pm after resting for a while she was served with kenkey with okro stew for supper. At 6:00pm, her vital signs were checked and recorded. Patient was made comfortable in bed. Her vital signs were checked and recorded at 10:00pm. At 10:30pm, patient went to bed.

Fifth Day of Admission (11th December, 2022).

According to the night staffs Miss B.S. woke up around 5:45am. Patient and mother had a cheerful facial expression because they knew they would possibly be discharged since she was well. At 6:00am, her vital signs were checked and recorded as indicated in the appendix. Her due medications were administered. She was served with oat with milk and bread as breakfast.

During ward rounds at 9:00am, patient did not lodge any new complains. Upon assessment by the medical officer, it confirmed that Miss B.S. was fit and well to be discharged. Patient was informed to come for review on the 16th December, 2022 at Municipal Hospital, Sunyani. Patient's mother was informed and hospital bills were assessed.

At 8:30am, the objective set on 8th December, 2022 “Patient’s normal nutritional pattern will be restored throughout the period of hospitalization as evidenced by; Patient verbalizing, she has regained her appetite and Nurse visualizing patient consuming ¾ of every meal served” was evaluated and goal was fully met as; Patient verbalized that she had gained her appetite and Nurse observed that patient consumed ¾ of rice and stew served.

Patient was discharged home with;

1. Tablet folic acid 5mg daily x 30days

Miss B.S. and mother were directed as to how to take the drug at home, side effect of the drug and the need to report any illness

Patient and mother were educated on the need to take nutritious diet rich in folic acid especially from green leafy vegetables and iron rich foods to prevent anemia, high caloric diet to give patient energy, protein to build and repair worn out tissue and supplemented with vitamins and fruit and to boost the immune system. They were also educated to ensure patient avoid stressors such as physical exertion, infections, dehydration and extreme cold as these trigger sickle cell with Vaso-Occlusive Crisis. I planned with patient on my second home visit on 14th December, 2022 and that all necessary arrangements for the visit were made. Vital signs prior to discharge were checked and recorded. They were accompanied to settle the bills.

She went through it easily since patient was insured. Patient’s name was written in the discharge book and her name was cancelled in the daily ward state. All other interventions undertaken were documented for easy referencing. Her mother was also assisted to carry their belongings in a taxi that was waiting for them in front of the ward and bade them goodbye. After the patient had been

discharged, the bed side locker and the bed were disinfected. All dirty bed linens and materials were removed. This was done to ensure cleanliness at the ward and to prevent cross infections.

4.2 Preparation of Patient/Family for Discharge

Preparation of Miss B.S. and family for discharge started on the day of admission to the day of discharge. It was aimed at ensuring provision of sufficient care and also giving patient and family insight into her condition (SCD).

Patient and mother were informed that staying in the hospital was for a temporal period of time. Education of patient and family on Sickle cell Disease were reemphasized. Patient was advised to adhere to medication regimen and follow up visits to the health facility. This was aimed at helping patient and mother in the provision of adequate care. They were also educated on the need to maintain hydrated and environmental hygiene to help improve immunity and blood circulation. They were advised to adhere to treatment given and also to report to the hospital immediately she experiences any abnormalities in her health so that early measure will be taken. Patient was asked to come for review on 14th December, 2022. The importance and necessity of the review was explained to the patient.

4.3 Follow Up/Home Visit/Continuity of Care

Home visit is a family-nurse contact which allows the health worker to assess the home and family situation in order to provide the necessary nursing care and health related services. The purpose of home visit is to find out needs of patient/family and community in relation to health, socio-economic and cultural aspects, to provide teaching regarding the prevention and control of

diseases, to assess the living condition of the patient/family, and to establish a close relationship between the nurses and the patient/family.

4.3.1 First Home Visit (9th December, 2022)

My first home visit to patient's house at Baako Niaba was on 9th December, 2022 at 12:30pm while patient was still on admission. Baako Niaka is a suburb in Sunyani. The main aim of the visit was to acquaint myself with the Patient's home environment, to familiarize myself with the other family members, to confirm information given to me about the family and their home environment, to find out their health needs and assist towards effective solutions to any health problems that may be identified and to find a healthcare provider I would hand over Patient to during the termination for care.

I left the hospital at 12:30pm to Baako Niaba based on the directions given by patient and mother. It was about a 20 minutes' drive from the hospital to patient's house. I reached patient's house with the house number BN2637603 adjacent Miracle primary school, Sunyani. I met patient's father at home upon arrival. We exchanged greeting, offered me a seat and water. I was asked the reason for the visit. I introduced myself as a final year student of Holy Family Nursing and Midwifery Training College, Berekum who had taken her grandmother to render her comprehensive nursing care in the hospital till she was discharged. I told him my visit was to help me interact with the other members of the family, give them the necessary support to promote health and also to find a healthcare provider to hand over patient to after I terminate my care.

Patient and family lived in their own house which was a "boys' quarters" with 5 rooms, a kitchen, a toilet and a bathroom. It was built with cement and blocks, roofed with corrugated iron

sheets and the windows are made of nets and Louver blades. Electricity was their main source of light. The rooms are spacious and have enough windows for good ventilation. The refuse bin is about 2km away from the house, but the house was littered with refuse and the refuse bin was dirty with flies which made the environment unclean. The source of water was a standing pipe which was in the middle of the house. The gutters were choked with stagnant water and refuse. I had the chance to enter patient's bedroom. She lived in a single room. The rooms had a bed, a computer, 2 plastic chairs, wardrobe and a standing fan. Her room was well kept and tidy. I used the opportunity to educate patient's father on the need to tidy their house environment and its importance. He thanked me for given him such education. He was reassured of his daughter health. I asked him for healthcare facility in their area of which he told me the health center has not been completely built but there was a nurse who lived 3 blocks from their house. I went to see him and told him my motive for handling over Miss B.S. to him after terminating care. Nurse R.T. agreed to take care Miss B.S., we exchanged contacts. I sought for permission to leave at 2:30pm.

4.3.2 Second Home Visit (14th December, 2022)

On Wednesday, 14th December, 2022 this was the third day after patient had been discharged. I paid Miss B.S. and family a visit at their home as planned. The purpose of this visit was to check on how patient was faring after discharge, to ascertain whether the education given to patient and her family during the period of hospitalization and first home visit had been adhered to and also to remind them of the review date.

On arrival to patient's home at 12:00noon, we exchanged greeting and pleasantries, the family were happy to see me again. Upon investigation, I realized that patient's condition had improved.

I was offered a seat and was asked my mission for visiting them. I told them of my mission for coming to the house, thus, to know how Miss B.S. was responding to the care being given in the house and also to emphasize on the need to keep their environment clean, it was also to remind them of the review date. I congratulated them for keeping the environment clean. Emphasis was made on the need for patient to take a well-balanced diet, prevent infection and keep hydrated. Lastly, I reminded them of the review date which was Friday, 16th December, 2022 and its importance.

I used that opportunity to observe her room and the environment again. I looked through the windows and realized it was cleaned. Patient and family had complied with the education given to them with regards to their personal hygiene.

At 1:20pm, I sought permission to leave and told them that I would officially visit them for the last time where I would terminate the care given. I bade them fare well and they expressed their gratitude for the help they had gotten so far from me and accompanied me to the road side before they departed.

4.3.3 Review: 16th December, 2022

On 16th December, 2022, patient and mother were met at the Out-Patient-Department of Municipal Hospital, Sunyani at 9:00am looking cheerful and lovely as noted from facial expression. Upon interaction with patient, it was observed that her condition had really improved. They were accompanied to go for the patient's card to be assessed. The vital signs were checked and recorded as follows; temperature 37.3^{o}C, pulse 92bpm, respiration 21cpm and Blood Pressure 120/84mmHg. At the Out-Patient-Department patient was seen by the medical

officer at the consulting room. Upon assessment by the medical officer, Miss B.S. was healthy. Patient made no complains. Patient and mother were told not to hesitate to report to the hospital if she should encounter any health problem. She was encouraged to eat well balanced diet and fruits. Patient was assured of a third home visit. I then accompanied them to get a taxi to their home.

4.3.4 Third Home Visit: 18th December, 2022

My last home visit was made on the 18th December, 2022 at 2:00pm. The main reason for conducting the third home visit was to: Assess the general condition of patient and family, reinforce the need to comply with treatment regimen, hand them over to the community nurse and finally terminate care.

On arrival we exchanged greetings, patient and relatives welcomed me warmly. Miss B.S. was happy and cheerful to see me again. She told me she was doing fine. I thanked them for their co-operation during the care. I also told them I was terminating care, but I had to leave them in the care of a healthcare provider. I called Nurse R.T., to patient's house. I handled over Miss B.S. to he and he promised to take care of her. Patient and family also promised to give their maximum co-operation with Nurse R.T. Permission was sought to leave. We all said a prayer and they escorted me to the roadside.

CHAPTER FIVE

EVALUATION OF CARE RENDERED TO PATIENT AND FAMILY

5.0 Introduction

Evaluation is the final step of the nursing process which allows the nurse to determine the patient's response to the nursing interventions and the extent to which the objectives have been achieved. The plan of nursing care is the basis for evaluation (Hinkle, & Cheever, 2017). This is the last phase of the nursing process. The chapter gives information about the statement of evaluation, amendment of nursing goals and the termination of the care rendered to patient and family.

5.1 Statement of Evaluation.

During patient's period of hospitalization with the diagnosis of sickle cell disease at the Sunyani Municipal Hospital, six health problems were recorded and objectives were set for them. Below is the summary of the interventions carried out and to what extent the goals were met.

1. Patient was relieved from joint pains within 24 hours (8th December, 2022)

On 7th December, 2022 at 10:10am, patient complained of pains in the joints, a nursing diagnosis of Acute pain related to vaso-occlusive crisis as evidenced by complains of joint pains and self-rating of pain as "8" on the numerical pain rating scale was formulated. An objective of patient will be relieved of pains within 24hours as evidenced by patient rating pain as "2" or below on the numerical rating scale and Nurse visualizing patient ambulating without pain was set. Nursing interventions implement to achieve these objectives are as follows; patient was

reassured that, measures such as ensuring rest and administering of drugs will be put in place to relieve her pains, patient's level of pain was assessed and patient rated it as 8 on the numerical pain rating scale of 0-10, A warm comfortable bed with warm blankets was provided for her to ensure rest, patient was encouraged to take in warm and adequate fluid, patient was engaged in diversional activities such as listening to music, prescribed intravenous fluids such as 2 litres of Normal saline was administered to flush rigid sticky sickled RBCs and restore microcirculation and prescribed pethidine 50mg in was administered to relieve her pain.

On 8th December, 2022 at 10:10am, the objective "Patient will be relieved of pains within 24hours as evidenced by; Patient rating pain as "2" or below on the numerical rating scale and Nurse visualizing patient ambulating without pain" set on 7th December, 2022 was evaluated and goal was fully met as; Patient rated her pain as 2 on the numerical rating scale and Nurse visualizing patient ambulate without complains of pain.

2. **Patient body temperature was restored to normal range within 48 hours (9th December, 2022)**

On 7th December, 2022 at 10:10am, patient had fever (38.0^{o}C) therefore a nursing diagnosis of Hyperthermia related to sepsis as evidenced by skin warm to touch was formulated. An objective of patient will regain her normal body temperature within 48 hours as evidenced by; Patient verbalizing that she has no more fever and Nurse recording an axillary temperature ranging from 36.2^{o}c to 37.2^{o}c was set. Nursing interventions implemented includes; Patient and her mother were reassured that fever control measures were being instituted to control fever, Axillary temperature was monitored and read 37.0^{o}c on evaluation, Patient was tepid sponged and sheets

were changed afterwards, Patient was served with cold "Malt" and water, Louvers were kept open to ensure adequate ventilation and 1g of tablet paracetamol was administered.

On 9th December, 2022 at 10:10am, the objective set on 7th December, 2022 for patient to record a normal body temperature ranging from 36.2°c to 37.2°c" was evaluated and goal was fully met as; Patient verbalized she has fever no more and Nurse recorded an axillary temperature of 37.0°c

3. Patient regained her ability to walk within 48 hours (9th December, 2022)

On 7th December, 2022 at 11:00am, patient reported of having difficulty walking, a nursing diagnosis of Impaired walking related to joint pains secondary to vaso-occlusive crisis as evidenced by impaired ability to walk required distance and fatigue was formulated. An objective of patient will regain her ability to walk within 48 hours as evidenced by; Patient verbalizing relief of pain and fatigue and Nurse observing patient walking from the bed to the bathroom, nurses' station and back was set. Nursing interventions implemented are as follows; Patient's ability to walk was assessed. Patient walked from bed to nurses' station and later from bed to the bathroom and back, Patient was encouraged to take 8 cups of copious fluid to prevent dehydration, Patient was served with nutritious diet rich in calories, proteins and iron to increase her energy level, A comfortable bed free from creases and cramps was made to ensure adequate rest, Tablet folic acid 5mg daily was administered and Patient's pain was managed with diversional therapy and tablet morphine 10mg. Patient also reported measure of pain management.

On 9th December, 2022 at 11:00am, the objective set on 7th December, 2022 for patient to regain her ability to walk within 48 hours was evaluated and goal was fully met as patient verbalized the

relief of pain and fatigue and Nurse observed patient walk from bedside to the bathroom without any challenges.

4. **Patient regained her normal nutritional pattern throughout the period of hospitalization. (11th December, 2022)**

On 8th December, 2022 at 8:30am, patient complained of loss of appetite, therefore a nursing diagnosis of Imbalanced nutrition: less than body requirement related to inadequate dietary intake as evidenced by poor appetite for food was formulated. An objective of Patient's normal nutritional pattern will be restored throughout the period of hospitalization as evidenced by; Patient verbalizing, she has regained her appetite and Nurse visualizing patient consuming ¾ of every meal served was set. Nursing interventions implemented include; Patient was reassured restoring her normal eating pattern, Patient brushed her teeth twice daily and mouth rinsed before and after meals, Patient was always asked about the food he will like to eat and food was served at right intervals (3-4 times) daily, the environment was always kept neat and free from nauseated substances such as vomits, urine, stool and dirty linen and Patient's favorite meals (rice and stew) was prepared and served.

On 11th December, 2022 at 8:30am, the objective set on 8th December, 2022 "Patient's normal nutritional pattern will be restored throughout the period of hospitalization as evidenced by; Patient verbalizing, she has regained her appetite and Nurse visualizing patient consuming ¾ of every meal served" was evaluated and goal was fully met as; Patient verbalized that she had gained her appetite and Nurse observed that patient consumed ¾ of rice and stew served.

5. **Miss B.S.'s regained her normal sleep pattern within 48 hours (10th December, 2022)**

On 8th December, 2022 at 9:00am, patient complained of having difficulties sleeping after awakening, a nursing diagnosis of Insomnia related to pain as evidenced by early awakening and difficulty maintain sleep state was formulated. An objective of patient will regain her normal sleep pattern within 48hours as evidenced by; Mother verbalizing patient can sleep normally and Nurse observing patient sleep for 6hours at night and a daytime nap of at least 2hours was set. Nursing interventions implemented includes; A complete history of patient's sleep was obtained which indicated that patient sleeps for at least 6hours normal and a daytime nap of 1hour, Bathing, urinating and toileting before going to bed were performed for the patient, The ward was kept calm and conducive for sleeping, A simple warm occupied bed free from creases and cramps was made for patient for to ensure a comfortable sleep, A plan was developed for patient to sleep that is she was to sleep for 6hours at night uninterrupted and 1hour during the day and On assessment it showed that, patient sleeps for 6hours at night and an hour during the day.

On 10th December, 2022 at 9:00am, the objective set on 8th December, 2022 "Patient will regain her normal sleep pattern within 48hours as evidenced by; Mother verbalizing patient can sleep normally and Nurse observing patient sleep for 6hours at night and a daytime nap of at least 2hours" was evaluated and goal was fully met as Relative verbalized patient could sleep well at night and during the day and Nurse observed patient sleeping for 6hours at night and 1hour during the day.

6. **Patient and mother had enough knowledge about the disease, Sickle Cell Disease within 24 hours (10th December, 2022)**

On 9th December, 2022 at 10:00am, upon conversation and observations made on patient and mother, it was realized that they had little knowledge about the condition (sickle cell disease), a nursing diagnosis of Knowledge deficit (patient and mother) related to lack of adequate

information on the causes, clinical manifestation and management of sickle cell disease was formulated. An objective of patient and mother will attain adequate knowledge on patient's condition (sickle cell disease); causes, its treatment and management within 24hours as evidenced by; Patient and mother demonstrating the measures to manage sickle cell disease and Nurse observing patient and mother asking questions to seek for clarification about the condition was set. Nursing interventions implemented are as follows; Patient and mother were reassured of gaining enough knowledge on SCD; causes, clinical manifestation and its management, Patient and mother's motivation and willingness to learn was assessed by observing their level of concentration, Teaching was adjusted to the level of understanding, educational background and learning style of the patient and relative by dividing the topic in subtopics and explaining them into details for maximum understanding before moving to the next subtopic, Good interpersonal relationship was established with patient and her mother to facilitate the learning process, Patient and relative were educated on the clinical manifestation, precipitating factors and management of SCD, Patient and relative were encouraged to ask questions bothering their mind and answers were provided tactfully in the language they understand and Patient and her mother correctly verbalized the causes, management, and complications of SCD just as they were taught.

On 10th December, 2022 at 10:00am, the objective set on 9th December, 2022 "Patient and mother will attain adequate knowledge on patient's condition (sickle cell disease); causes, its treatment and management within 24hours as evidenced by; Patient and mother demonstrating the measures to manage sickle cell disease and Nurse observing patient and mother asking questions to seek for clarification about the condition" was evaluated and goal was fully met as Patient and mother verbalized the causes, management and complications of SCD and Nurse observed patient and mother asked enough questions to clarify their doubt about SCD.

5.2 Amendment of care

Despite the numerous problems identified, with the individualized comprehensive nursing care and support from other members of the health team and co-operation of Miss B.S. and family, all the goals set were fully achieved. The care plan was therefore not amended.

5.3 Termination of care

This forms the last aspect of the interaction with patient and family. Due to the psychological effects accompanying separation, it could sometimes lead to anxiety and depression. To avoid this, patient and family were prepared psychologically from the day of admission to the day of discharge.

I made my last home visit on the 18th December, 2022. The main aim of the visit was to find out how patient and her family members were doing and to terminate the care by handing over healthcare provider and members of her family to continue the care.

After exchange of greetings and a little interaction, patient and her family confirmed they were doing well. I thanked them for their co-operation. I informed them that now that Miss B.S.'s health has been restored; the care has officially ended. I advised them to report to the nearest health facility in case of any illness. They were not surprise to hear of the termination of care due to prior notice.

She was however handed over fully to a nurse, who promised to take very good care of her. I told them I would visit them unofficially whenever I had the chance. They were happy and said that they would miss my care and would strictly adhere to all instructions given to them. It was a moment to remember when I told them of my intention to leave. There was no separation anxiety

as patient and the relatives had enough psychological preparations from the day of admission till discharge but it was still difficulty bidding them farewell.

CHAPTER SIX

SUMMARY AND CONCLUSION

6.0 Introduction

Summary is a brief statement or resentment of main points, especially as a conclusion to a work (Mcintosh, 2022). Conclusion is the last part of something or an opinion reached after some thought or the final part something (Mcintosh, 2022). This is the last step of the patient/family care study which entails the student's personal appreciation of the therapeutic relationship with the patient as well as the use of the nursing process.

6.1 Summary of care rendered.

Miss B.S., a 16-year-old girl was admitted on 7th December, 2022 around 10:00am at the Municipal Hospital Sunyani with sickle cell disease with vaso-occlusive crisis on referral from the emergency unit. Her vital signs on the day of admission were checked and recorded as;

1. Temperature 38.0 degree Celsius
2. Pulse 98 beats per minute
3. Respiration 21 cycles per minutes
4. Blood Pressure 130/86mmHg
5. Weight 65kg

She presented with high body temperature, joint pains and difficulties walking. She spent a total of five days at the hospital. During her period of hospitalization six (6) health problem were identified. These were; fever, joint pains, loss of appetite, difficulties walking, difficulties sleeping after awakening and inadequate information on sickle cell disease. Nursing diagnosis was formulated for each of the problems and in order to solve these problems objectives were set,

nursing orders were given, orders were implemented and all the goals were fully met. The following diagnostic investigations were done;

1. Blood for malaria parasites was negative
2. Blood for full blood count indicated WBCs were above normal range.
3. Urine Routine Examination indicated normal

Patient was managed with;

1. Intravenous normal Saline 0.9% 2 liter for 24 hours
2. Pethidine injection 50mg/ml in 2ml stat.
3. Tablet morphine sulphate 10mg tds for 5 days.
4. Tablet cefuroxime 250mg bd for 5days.
5. Tablet paracetamol 1gram tds for 7 days
6. Tablet folic acid 5mg for 1daily x 30days
7. Intravenous cefuroxime injection 750 mg tds for 1 day.
8. Dextrose in Sodium Chloride 5% in 0.9% (500ml) 1L x 24hours

On 11th December, 2022 during ward round patient was discharged. She was discharge with tablet folic acid 5mg daily for 30days. Her mother was directed to go to the billing office to assess their bill. I accompanied patient's mother to go and pay the assessed bill. Patient was encouraged to continue taking her drugs and was educated on the side effects of the drug and the need to report any illness.

Patient and mother were informed of the review date 16th December, 2022. The need to take in medication was emphasized and review date was stressed. Patient and relative were educated on how to keep the home clean and also abide by all the preventive measures already communicated to them.

Three (3) home visits were embarked upon. My first home visit was on 9th December, 2022, the main aim of the visit was to acquaint myself with the patient's home environment, to familiarize myself with the other family members, to confirm information given to me about the family and their home environment, to find out their health needs and assist towards effective solutions to any health problems that may be identified and to find a healthcare provider in the town to handover patient to after the termination of care. The second home visit was on 14th December, 2022 and the purpose of the visit was to ascertain whether the education given to her and her family during the period of hospitalization and first home visit had been adhered to and also to remind them of the review date. The third home visit was on 18th December, 2022 and the reason for the visit was also to assess the general condition of patient and family, reinforce the need to comply with treatment regimen, hand them over to the healthcare provider and finally terminate care.

6.2 Conclusion.

The care study for Miss B.S. and her family ended successfully and it has increased and given me much knowledge on the causes, signs and symptoms, diagnosis, treatment and complications of sickle cell disease. The study has equally assisted me to transfer the theoretical knowledge into practice and I have gained enough knowledge in the practical aspect. This study enabled the patient to have increased time with clinical team members and also help patient gain better

understanding of their condition and management. It has also helped me to establish a good interpersonal relationship and skills with the patient and her family which enhanced her recovery. I therefore recommend that every health institution should employ the use of the nursing process, so as to enable them provide individualized, holistic and comprehensive nursing care to help decrease re-occurrences of diseases in our hospitals as well as reducing mortality rate. I also recommend that every nursing student be given the opportunity to embark on the patient/family care study to enable them obtain more insight on the condition under study.

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APPENDIX

Date	**Time**	**Temperature (^{O}c)**	**Pulse (Bpm)**	**Respiration (Cpm)**	**Blood Pressure (Mmhg)**
7/12/2022	10:00am	38.0	98	21	130/86
	2:00pm	37.0	78	20	110/60
	6:00pm	37.1	70	22	121/54
	10:00pm	36.2	82	24	119/63
8/12/2022	6:00am	36.9	66	19	128/74
	10:00am	35.4	62	18	127/56
	2:00pm	36.8	53	19	110/80
	6:00pm	36.4	88	25	129/70
	10:00pm	37.0	89	24	130/80
9/12/2022	6:00am	36.7	84	20	140/70
	10:00am	37.2	79	22	130/84

	2:00pm	36.4	81	21	132/72
	6:00pm	36.9	84	23	120/70
	10:00pm	37.8	80	24	119/88
10/12/2022	6:00am	37.0	80	24	130/71
	10:00am	37.2	82	22	129/69
	2:00pm	36.9	81	23	118/70
	6:00pm	37.0	78	21	129/80
	10:00pm	36.8	89	24	130/80
11/12/2022	6:00am	36.8	84	22	120/84
	10:00am	37.0	89	24	130/80
16/12/2022 (Review date)	9:30am	37.3	92	21	120/84

SIGNATORIES

THE STUDENT NURSE

NAME: CINDY OPOKU BOAHEN

SIGNATURE: .....

DATE: 05-07-2023

THE NURSE-IN-CHARGE OF FEMALE MEDICAL WARD (MUNICIPAL HOSPITAL, SUNYANI)

NAME: Mrs. OWUSU BRIDGET

SIGNATURE: .....

DATE: 05/07/2023

THE SUPERVISOR, NURSING AND MIDWIFERY TRAINING COLLEGE, BEREKUM

NAME: JOSEPH APPIAH

SIGNATURE: for .....

DATE: 05-07-2023

THE PRINCIPAL OF HOLY FAMILY NURSING AND MIDWIFERY TRAINING COLLEGE, BEREKUM

NAME: MONICA NKRUMAH

SIGNATURE: .....

DATE: 17/07/23

PRINCIPAL
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