

“A Study To Assess The Knowledge Of Internship Students On Management Of Blood Transfusion And Its Complications At Teerthanker Parshvnath School Of Nursing With A View To Develop An Information Booklet”

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Abstract

Blood transfusion is the process of transferring blood products into one's circulation intravenously. A study was conducted to assess the knowledge of internship students on management of blood transfusion and its complications at Teerthanker Parshvnath School Of Nursing with a view to develop an Information Booklet . The research approach and design selected for the study was **Quantitative with non experimental descriptive design**. The sample size for the study was 40 GNM internship students. Sampling technique adopted for was **purposive sampling technique**. Tools used for the study were: Tool 1: Demographic variables, Tool 2: Self structured knowledge questionnaire and Tool 3: information booklet. Validity of the tool was done by giving it to five experts in the field of Medical Surgical Nursing and Community health Nursing. Majority of 17(42.5%) GNM internship students were in the age group of (20-22) years, maximum 27 (67.5%) were female students. Highest 23(57.5%) parents were from non medical field, majority of 30 (75%) had previous knowledge on management of blood transfusion and its complications and about 14(35%) of internship students are getting information from class. Majority of 30 (75%) had knowledge and 10 (25%) had no knowledge at all on management of blood transfusion and its complications. Related to the sources of information about 14(35%) of internship students are getting information from class, 6(15%) of them from internet, 15(37.5%) of them from books, 5(12.5%) of them from internet. Majority 33(82.5%) students had moderate knowledge. Maximum 5(12.5%) student had high and 2(5%) students had low knowledge on management of blood transfusion and its complications. For variables; age ($\chi^2=5.189$, $p=0.269$), Gender ($\chi^2=3.435$, $p=0.180$), Parents occupation ($\chi^2=1.719$, $p=0.423$), previous knowledge ($\chi^2=0.344$, $p=0.842$), sources of information ($\chi^2= 8.799$, $p=0.186$), was not found to be associated with Knowledge scores.

Date of Submission: 01-02-2023

Date of Acceptance: 11-02-2023

I. INTRODUCTION

Blood transfusion is one of the most important aspect for nursing professional. The nurse's knowledge about the blood transfusion is essential for the safe practice.¹ It is a lifesaving procedure which promotes the health condition of the patient if done in well manner. If not, then there is elevated risk for severe adverse conditions of the patient.

Statement:

“A study to assess the knowledge of internship students on management of blood transfusion and its complications at Teerthanker Parshvnath School Of Nursing with a view to develop an information booklet”

Objective of the study:

1. To identify the socio-demographic variables
2. To assess the knowledge of GNM internship student on management of blood transfusion and its complication.
3. To determine the association between the knowledge of internship student on management of blood transfusion and its complication with selected demographic variables.
4. To develop an information booklet on management of blood transfusion and its complication.

Hypothesis

H1: The internship student may have inadequate knowledge on management of blood transfusion and its complication.

H2: There will be significant association between the knowledge on management of blood transfusion and its complications.

Conceptual framework

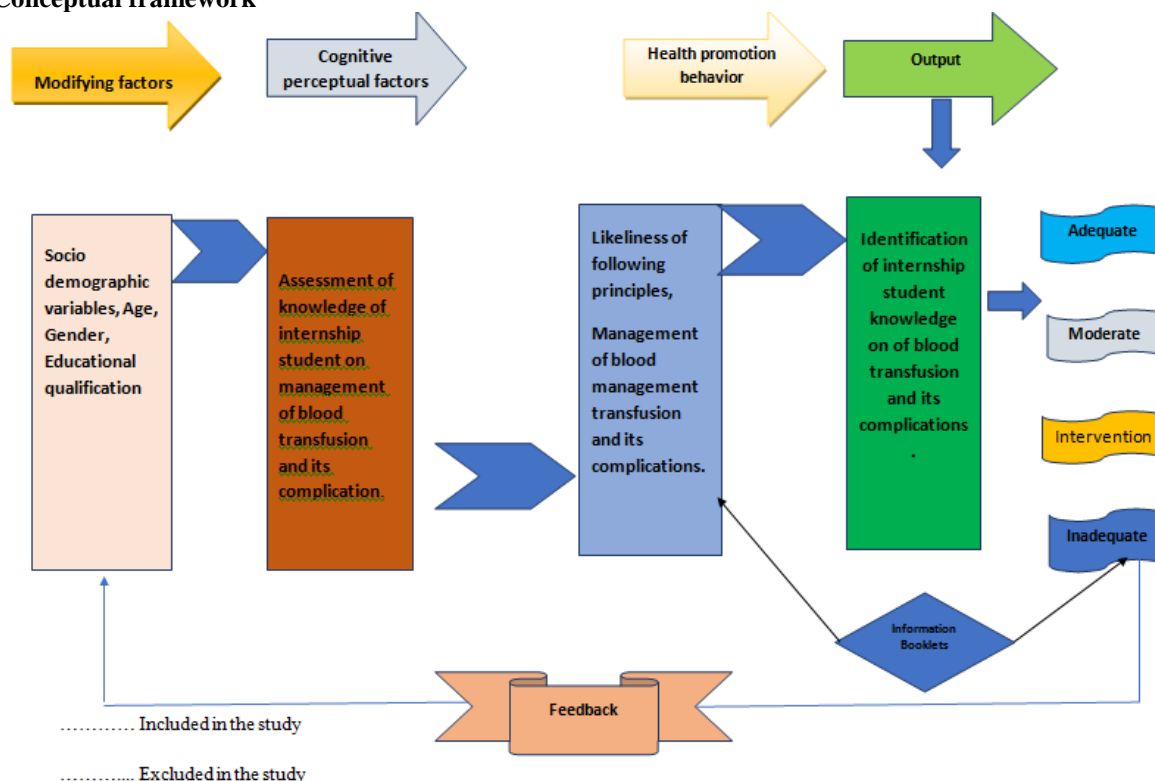


Figure. Modified Pender’s Health promotion Model (1996)

Research methodology

A **Non-experimental descriptive** study was conducted to assess the knowledge of internship student on management of blood transfusion and its complications. In this study, Knowledge score of internship student on the management of blood transfusion and its complications was the dependent variable. The target population of the present study is GNM Internship students of Teerthanker Parshvnath College of Nursing , TMU Moradabad. The sample size of present study was comprised of 40 GNM internship students who fulfill the inclusion criteria were selected to collect the data. The purposive sampling technique was used to collect data from the available samples falling under inclusion criteria. Data collection tool used for the present study is a Self-Administered Structured Questionnaire. The resulting score of knowledge were ranged in arbitrary scoring as follows: Low (1-13), Moderate (14-26), High (27-40)

Results

SECTION –1

Distribution of the demographic characteristics

This section describes frequency and percentage distribution of demographic characteristics of 40 GNM internship students from Teerthanker Parshvnath College of nursing

Table 1:Frequency and percentage distribution of the demographic characteristics of the GNM internship students

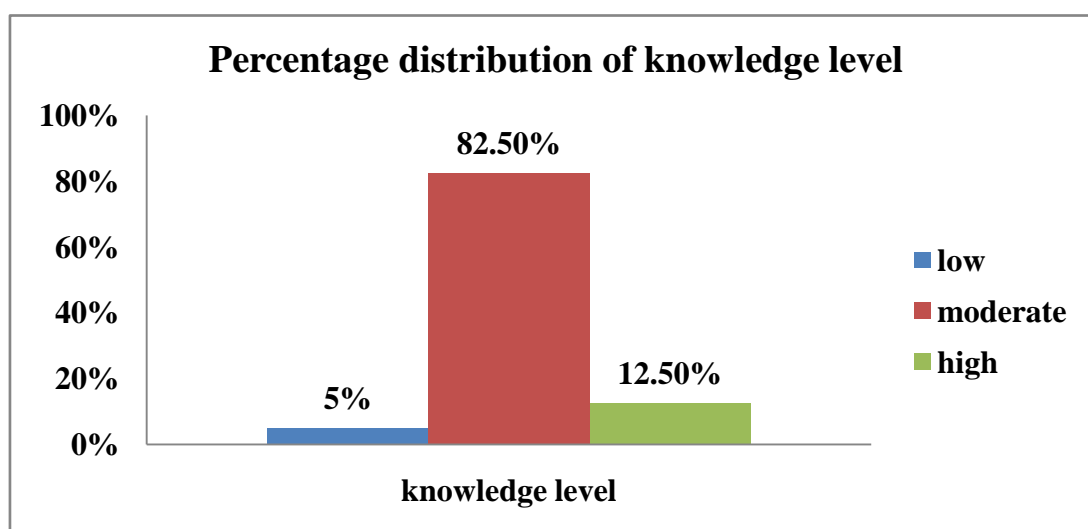
n=40

S.No	Variables	Frequency (f)	Percentage (%)
1.	Age in years		
	a) 19-20	15	37.5
	b) 20-22	17	42.5
	c) 22-25	8	20
2.	Gender		
	1. Male	13	32.5
	2. Female	27	67.5
3.	Parents occupation		
	1. Medical	17	42.5
	2. Non medical	23	57.5
4.	Any previous knowledge related to management of blood transfusion and its complication		
	1. Yes	30	75
	2. No	10	25
5.	If any sources information		
	1. Class	14	35
	2. Internet	6	15
	3. Books	15	37.5
	4. Seminar	5	12.5

The data presented in table above shows that majority of 17(42.5%) GNM internship students were in the age group of (20-22) years, 15(37.5%) were in the age group of (19-20) and 8(20%) were in the age group of (22-25)years. In gender maximum 27 (67.5%) were female and 13(32.5%) were male students. Highest 23(57.5%) parents were from non medical and about 17 (42.5%) were from medical field. Majority of 30 (75%) had knowledge and 10 (25%) had no knowledge at all on management of blood transfusion and its complications. Related to the sources of information about 14(35%) of internship students are getting information from class, 6(15%) of them from internet, 15(37.5%) of them from books, 5(12.5%) of them from internet.

SECTION –2

Section 2; A; Knowledge level of GNM internship students on management of blood transfusion and its complications. Total no of items were 40. Knowledge was categorized in following; low (1-13), moderate (14-26), high (27-40).



The data presented in above fig 2 shows that majority 33(82.5%) students had moderate knowledge. Maximum 5(12.5%) student had high and 2(5%) students had low knowledge on management of blood transfusion and its complications.

Section 2: B; Table 2; Mean and mean percentage distribution of knowledge scores on management of blood transfusion and its complication

Sl. No.	Area wise aspects	No. of items	Knowledge score	
			mean	Mean %
1	Management of blood transfusion and its complication	40	21	52.59

The data presented in the Table 2 above shows that overall mean percentage of knowledge level was 52.59%.

SECTION -3

Association between selected socio-demographic variables with knowledge

The association between selected socio-demographic variables with knowledge presented in Table 3 below: -

Table 3: -Association between selected socio-demographic variables with knowledge level on management of blood transfusion and its complication

<i>n=40</i>								
Sl. No	Sample characteristics	Frequency (f)	Knowledge score			Chi-square	Df	p value
			Low	Moderate	High	χ^2		
1	Age in years					5.187	4	.269
	a) 19-20	15	2	8	5			
	b) 21-22	17	1	14	2			
	c) 23-25	8	0	8	0			
2	Gender					3.435	2	.180
	a) Male	13	1	11	1			
	b) Female	27	2	19	6			
3	Parents occupation					1.719	2	.423
	a) Medical	17	1	12	4			
	b) Non medical	23	18	2	3			
4	Any previous knowledge related to management of blood transfusion and its complication					0.344	2	.842
	a) Yes	30	2	22	6			
	b) No	10	1	8	1			
5	If any sources information					8.799	6	.186
	a) Class	14	1	12	1			
	b) Internet	6	0	5	1			
	c) Books	15	1	9	5			
	d) Seminar	5	1	4	0			

***Significant at 0.05 level**

The data is the above mentioned Table.3.shows that the variables age ($\chi^2=5.189$, $p=0.269$), Gender ($\chi^2=3.435$, $p=0.180$), Parents occupation ($\chi^2=1.719$, $p=0.423$), previous knowledge ($\chi^2=0.344$, $p=0.842$), sources of information ($\chi^2= 8.799$, $p=0.186$), was not found to be associated with Knowledge scores.

Hence, research hypothesis (H₂) was rejected and null hypothesis was accepted.

II. Discussion

Assessment of knowledge

The present study shows that majority 33(82.5%) students had moderate knowledge. Maximum 5(12.5%) student had high and 2(5%) students had low knowledge on management of blood transfusion and its complications.

The findings of the present study conducted by Y Aslani, Shahram and N Kobra (2004), on knowledge of blood transfusion among nurses. Total sample size was 117. The results of the study found that maximum 12% had poor knowledge on blood transfusion, about 21% had good knowledge and 66.7% had average knowledge on blood transfusion.²

The finding of present study was conducted on knowledge on management of blood transfusion and its complications. The overall mean percentage of knowledge level was 52.59%.

The finding of the present study conducted by B Encan and S Akin (2019) on assessment of knowledge of blood transfusion among nurses. The mean score was 23.65 of a possible score of 40.³

Association between selected socio-demographic variables with knowledge level on management of blood transfusion and its complication

The data presented in present study were, for variables;age ($\chi^2=5.189, p=0.269$), Gender ($\chi^2=3.435, p=0.180$), Parents occupation ($\chi^2=1.719, p=0.423$), previous knowledge ($\chi^2=0.344, p=0.842$), sources of information ($\chi^2=8.799, p=0.186$), was not found to be associated with Knowledge scores. It shows there was no statistical significance between demographic characteristics with knowledge score.

The present study was conducted by Siliman M Hanan, Elhapashy M Heba (2021), on nurses' competence in safety blood transfusion: the impact of training module. The study results shows that for variables;age ($\chi^2=3.348, p=0.817$), Gender ($\chi^2=4.640, p=0.031$), yr of experience ($\chi^2=8.929, p=0.030$), was not found to be associated with Knowledge scores. It shows there was no statistical significance between demographic characteristics age and gender with knowledge level but the variable year of experience was associated with knowledge level.⁴

III. Conclusion:

The finding of the present study concluded that the nurses had a moderate knowledge on management of blood transfusion and its complications. There was a positive association of high statistical significance between the demographic characteristics and knowledge level. Blood transfusion is both a life saving and a high risk invasive procedure. Students need to expose more in clinical areas and require more support to improve their knowledge, as well as more support and education to improve competence in safe blood transfusion knowledge and practices.

Nursing implications

1. Information booklet and questionnaire can be kept in the library as a resources material.
2. In service education and workshop can be conducted in the blood bank department to increase the knowledge of blood transfusion regarding management of blood transfusion and its complication.
3. Designing educational programs and ensuring the exposure of clinical area is likely to update the student's knowledge and skills.

Recommendations

1. A similar study may be conducted on a large sample for wider generalization
2. A similar study may be conducted to evaluate the effectiveness of self instructional module regarding management of blood transfusion and its complications.

3. A similar study can be conducted in hospital to assess the knowledge and practices of staff nurses.
4. An experimental study could be undertaken with control group.
5. Training programs can be administered in nursing colleges and hospitals.
6. Optimizing the use of nursing interventions during blood transfusion and improving standards of care through adhering to blood transfusion practice guidelines.
7. Evidence based practices for blood transfusion should be integrated into the nursing curriculum.

INFORMATION BOOKLETS ON MANAGEMENT OF BLOOD TRANSFUSION AND ITS COMPLICATION.



INTRODUCTION: -

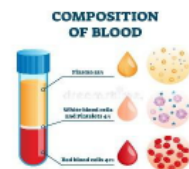
Blood is a collection of cells that have been described as the fluid connective tissue that carries oxygen and nutrients to the body. The normal volume of blood in the human body is 5 liters generally the PH of blood is 7.4 which is slightly alkaline. The blood comprises of 8% of our total body weight.



❖ COMPOSITION OF BLOOD

Blood is a straw-colored fluid which is composed of Plasma about 55% and 45% cells respectively.

- Plasma: The plasma constitutes about 92% of water and 8% of organic and inorganic substances. About that 7% are replaced by plasma proteins.
- Cellular components: All the blood cells are originated from pluripotent stem cells, then only they are transformed into R.B.C, W.B.C, platelets, through the process of hematopoiesis.

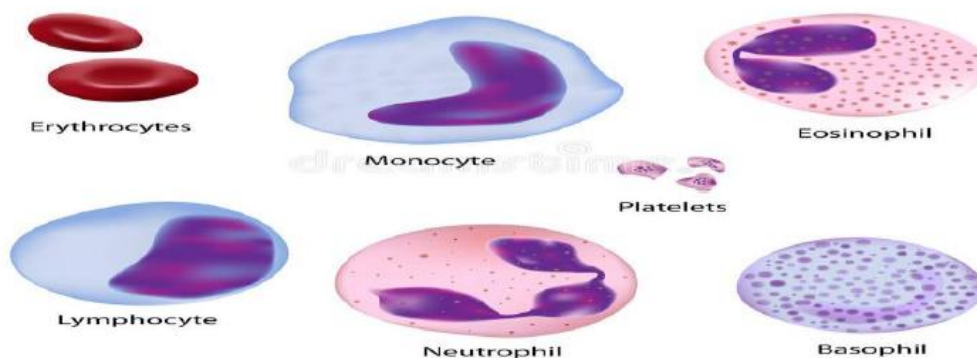


Three are three types of blood cells are present in the body,

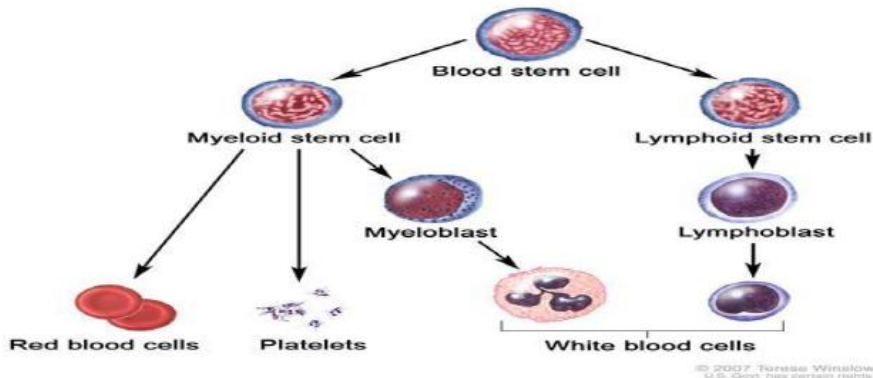
1. Erythrocytes or red blood corpuses.
2. Leukocytes or white blood corpuses.
3. Platelets or thrombocyte.



The Elements of Blood



❖ DIAGRAMATIC REPRESENTATION OF BLOOD CELLS FORMATION: -



❖ ERYTHROCYTES:

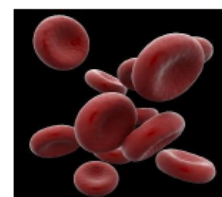
The RBC are formed through the process of hemopoiesis. Generally, the RBC are about 4.5-5.5 million/ cumm and they are biconcave in shape which carries the hemoglobin. * Hemoglobin is a conjugated protein which is synthesized inside the erythrocytes.

* In this the protein portion is called globin and the non-protein portion is called

“heam”.

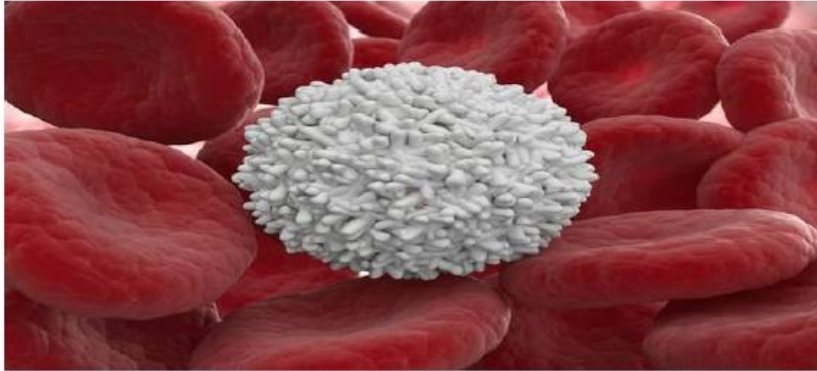
* The normal level of hemoglobin is 12.5gm/dl. The life span is about 120days.

* After 120 days, they undergo lysis and splits and converted into bilirubin and biliverdin which can be excreted in urine and feces. If this hemoglobin level decreases, it leads to anemia.

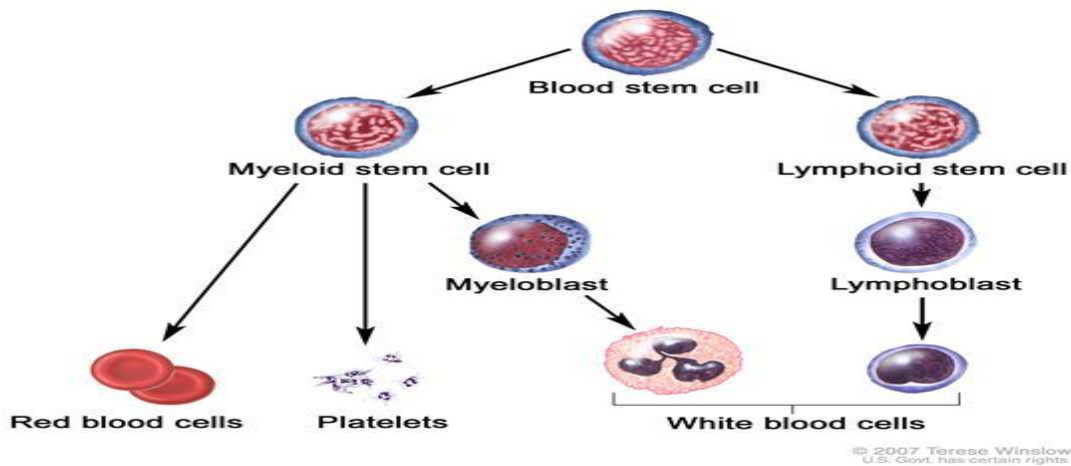


❖ **LEUKOCYTES: -**

These are also called as white blood corpuscles, which are mainly responsible for the defense mechanism against the foreign substances. It includes granulocytes and agranulocytes. The granulocytes consist of neutrophils, basophils, eosinophils. Whereas the agranulocytes consist of monocytes and lymphocytes. The normal WBC count is 4000-11,000/cu/mm.



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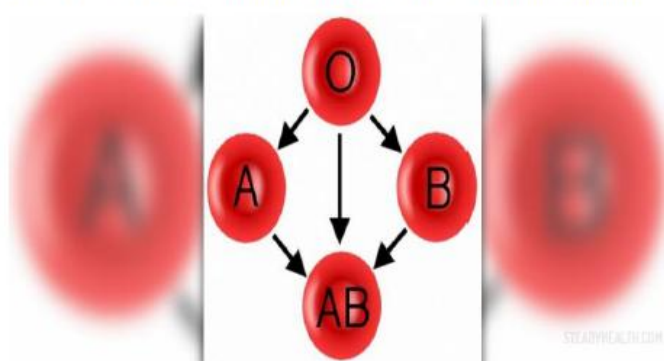
THROMBOCYTES OR PLATELETS: -

Thrombocytes are also called as platelets. The normal platelet count is about 1.5-4.5 lakh/cumm of blood. Generally, these are disc shaped and having the normal life span of 5-9 days. The major role of platelets is attaining hemostasis which forms the platelet plug and inhibits the bleeding.

❖ **BLOOD GROUPS: -**

The human blood is divided into various categories based on their groups are present in the human body.

1. A group
2. B group
3. AB group
4. O group



➤ **Blood group A:**

The blood group A contains antigen A on surface and Anti B antibodies in the serum. The group A is compatible with A group and O group.

➤ **Blood group B:**

The B group blood contains antigen B on surface and Anti A antibodies in the serum. The B group is compatible with B group and AB group. A O B AB 106.

➤ **Blood group AB:**

The AB group blood contains both antigen A and antigen B on surface of RBC, and the serum doesn't contain Anti A, B antibodies in the serum. These group people is compatible with blood group A, B, AB, O and therefore they are called universal recipient.

➤ **Blood group O:**

In this the surface antigen is absent on RBC, but the serum contains both anti A and anti B antibodies. Because of this reason, they can capable to donating blood to the any group of people. So they are called as universal donors but they are capable to receive, they have to take blood from O group people only.

➤ **COLOUR SCHEME: -**

Following color code is used to differentiate the ABO group label

- Blood group O : Blue
- Blood group A : Yellow
- Blood group B : Pink
- Blood group AB : White

❖ **BLOOD TRANSFUSION:**

It is the procedure in which a patient receives a blood product through an intravenous line. Or Introduction of new matching blood into the blood stream or/and of any specific blood components.

* Types of blood transfusion

- ♣ Fresh blood transfusion – blood less than 24hours old from the time of collection
- ♣ Autologous transfusion – blood collected from a patient for re-transfusion at a later time into the same individual
- ♣ Massive transfusion – number of units transfused in a 24hours periods exceeds the recipients blood volume
- ♣ Multiple transfusion – repeated transfusion of blood over a long period of time (months or year).



➤ INDICATIONS FOR BLOOD TRANSFUSION: -

- ♣ Massive blood loss
- ♣ Different types of anemia
- ♣ Hemophilia and other clotting factor deficiency
- ♣ Cancer patients (hematologic malignancies)
- ♣ For surgeries

✚ BLOOD PRODUCTS: Any therapeutic substance prepared from human blood

a. Whole blood: Unseparated blood collected into an approved container containing an anticoagulant-preservative solution

b. Blood component: A constituent of blood, separated from whole blood, such as:

- Red blood cells
- Platelets

Plasma- It contains, Cryoprecipitate, Others – It include plasma proteins -Immunoglobulin's, Coagulation factors, Albumin, Anti-D, colloid volume expanders.

➤ GUIDELINES FOR TRANSFUSION PRACTICES.

Whole blood:

It can be collected in semipermeable membrane bag and one unit of whole blood contains: Up to 510 ml total volume, in that

- 450donor blood
- 63mlanticoagulant-preservative solution
- Hematocrit 35%–45%
- No functional platelets
- No labile coagulation factors (V and VIII)

➤ SPECIAL CONSIDERATIONS FOR USE OF COMPONENTS

Red Cell Transfusion

* Red cell transfusion shall be ABO and Rh (D) compatible.

*Transfusion of one unit of red cells shall not take longer than 4 hours and should within 30 minutes of taking out of refrigerator.

Fresh frozen Plasma

♣ Plasma transfusion shall be ABO compatible.

♣ Cross matching tests are usually not performed on plasma. If it is used as a source of labile coagulation factors, it shall be used immediately and in any case within 6 hours after thawing. ♣ If used for a purpose other than labile coagulation factor replacement, it shall be transfused within 24 hours after it is thawed and stored at 1-6 °Celsius

Cryoprecipitate

❖ It prepared from the fresh frozen plasma and contains clotting factor VIII and fibrinogen.

❖ Cryoprecipitate is thawed at 30-37oC for not more than 15 minutes and shall be transfused as early as possible after issue. ABO compatibility is not required.

Single donor plasma

After thawing, single donor plasma shall be transfused immediately. If not, it shall be stored at 1-6oC and used within 24 hours.

Platelets:

- ❖ Platelets shall be ABO-identical but in absence of availability of ABO compatible platelets, ABO-incompatible platelets can be used.
- ❖ After pooling, platelet concentrates should be infused as soon as possible, generally within 4 hours, because of the risk of bacterial proliferation
- ❖ Must not be refrigerated before infusion and should be infused over a period of about 30 minutes.

➤ **PROCEDURE:**

- Verify doctor’s order.
- Inform the client and explain the purpose of the procedure. Check for cross matching and typing. to ensure compatibility
- Obtain and record baseline vital signs
- Practice strict asepsis
- At least 2 licensed nurse check the label of the blood transfusion. Check the following:

- a. Serial number
- b. Blood component
- c. Blood type
- d. Rh factor
- e. Expiration date
- f. Screening test (VDRL, HBsAg, malarial smear) – this is to ensure that the blood is free from blood-carried diseases and therefore, safe from transfusion.

✚ Warm blood at room temperature before transfusion to prevent chills.

✚ Identify client properly. Two Nurses check the client’s identification.

✚ Use needle gauge 18 to 19 to allow easy flow of blood.

✚ Use BT set with special micron mesh filter to prevent administration of blood clots and particles.

✚ Start infusion slowly at 10gtts/min. Remain at bedside for 15 to 30 minutes. Adverse reaction usually occurs during the first 15 to 20 minutes.

✚ Monitor vital signs. Altered vital signs indicate adverse reaction (increase in temp, increase in respiratory rate)

✚ Do not mix medications with blood transfusion to prevent adverse effects.

✚ Do not incorporate medication into the blood transfusion. Do. Do not use blood transfusion lines for IV push of medication.

✚ Administer 0.9% NaCl before, during or after BT. Never administer IV fluids with dextrose. Dextrose based IV fluids cause hemolysis.

✚ Administer BT for 4 hours (whole blood, packed RBC). For plasma, platelets, cryoprecipitate, transfuse quickly (20 minutes) clotting factor can easily be destroyed. Σ Observe for potential complications. Notify physician.

❖ **COMPLICATIONS OF BLOOD TRANSFUSION:**

The Reaction occurs during and after transfusion of the Blood. Transfusion complications can be classified as, immediate complications and delayed complications

1. Immediate complications: Reaction occurs within 24hours after the transfusion.

♣ **Allergic reaction:**

Flushing, rash, hives, pruritus, laryngeal edema, difficulty of breathing.

♣ **Febrile, Non-hemolytic reactions:**

Sudden chills and fever, flushing, headache, anxiety.

♣ **Septic reaction:**

Rapid onset of chills, vomiting, hypertension, high fever

♣ **Circulatory overload:**



Raise in venous pressure, dyspnea, crackles, distended neck vein, cough, and elevated BP

♣ Hemolytic reaction- it is caused by infusion of incompatible blood products. Fever, chills, pain at reaction site, nausea, vomiting, shock, dark urine

♣ Transfusion related acute lung injury (TRALI)

♣ Clotting abnormalities

♣ Thrombophlebitis

2. Delayed complications: reaction occurs more than 24hours after transfusion

- Infections- HIV, Hepatitis B and C, syphilis,
- Iron overload
- Immune sensitization
- Graft versus host disease
- Post transfusion purpura

❖ **MANAGEMENT IN PREVENTION OF TRANSFUSION REACTION:**

✚ Meticulously verifying patient identification beginning with type and cross match sample collection and labelling to double check blood product and patient identification prior to transfusion.

✚ Inspecting the blood product for any gas bubbles, clotting, or abnormal color before administration.

✚ Beginning transfusion slowly (1to2mL/min) and observing the patient closely, particularly during the first 15 minutes (severe reactions usually manifest within 15 minutes after the start of transfusion).

✚ Transfusing blood within 4hours and changing blood tubing every 4 hours to minimize the risk of bacterial growth at warm room temperatures.

✚ Preventing infectious disease transmission through careful donor screening or performing pretest available to identify selected infectious agents.

✚ Preventing GVH disease by ensuring irradiation of blood products containing viable WBC's (i.e., whole blood, platelets, packed RBC's and granulocytes) before transfusion; irradiation alters ability of donor lymphocytes to engraft and divide.

✚ Preventing hypothermia by warming blood unit to 37 C before transfusion.

✚ Removing leukocytes and platelets aggregates from donor blood by installing a micro aggregate filter (20-40-um size) in the blood line to remove these aggregates during transfusion.



❖ **ON DETECTING ANY SIGNS OR SYMPTOMS OF REACTION:**

♥ Stop the transfusion immediately and notify the physician.

♥ Disconnect the transfusion set-but keep the IV line open with 0.9% saline to provide access for possible IV drug infusion.

♥ Send the blood bag and tubing to the blood bank for repeat typing and culture.

♥ Draw another blood sample for plasma hemoglobin, culture, and retyping.

♥ Collect a urine sample as soon as possible for hemoglobin determination.

❖ **INTERVENE AS APPROPRIATE TO ADDRESS SYMPTOMS OF THE SPECIFIC REACTION:**

➤ Treatment for hemolytic reaction is directed at correcting hypotension, DIC, and renal failure associated with RBC hemolysis and hemoglobinuria.

➤ Febrile, non-hemolytic transfusion reactions are treated symptomatically with antipyretics, leukocyte-poor blood products may be recommended for subsequent transfusions.

➤ In septic reaction, treat septicemia with antibiotics, increased hydration, steroids and vasopressors as prescribed.

➤ Intervene for allergic reaction by administering antihistamines, steroids and epinephrine as indicated by the severity of the reaction. (If hives are the only manifestation, transfusion can sometimes continue but at a slower rate.)

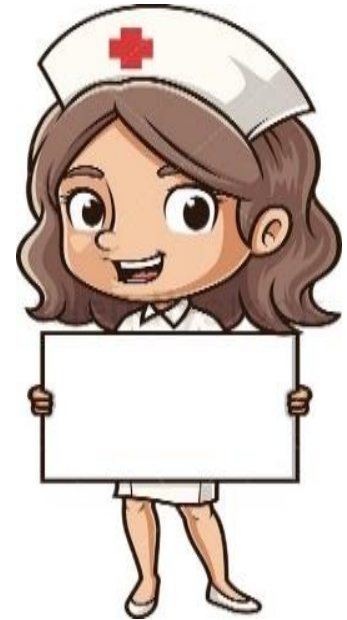
➤ For circulatory overload, immediate treatment includes positioning the patient upright with feet dependent; diuretics, oxygen and aminophylline may be prescribed.

❖ **NURSING INTERVENTIONS**

If blood transfusion reaction occurs:

STOP THE TRANSFUSION.

- ✚ Start IV line (0.9% Nalco)
 - ✚ Place the client in Fowler’s position if with Shortness of Breath and administer O2 therapy.
 - ✚ The nurse remains with the client, observing signs and symptoms and monitoring vital signs as often as every 5 minutes.
 - ✚ Notify the physician immediately.
 - ✚ The nurse prepares to administer emergency drugs such as antihistamines, vasopressor, fluids, and steroids as per physician’s order or protocol.
 - ✚ Obtain a urine specimen and send to the laboratory to determine presence of hemoglobin as a result of RBC hemolysis.
 - ✚ Blood container, tubing, attached label, and transfusion record are saved and returned to the laboratory for analysis
-THE END.....



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