Hematological System NCLEX Review

Hematological Disorders

Blood and blood products:

1. Given via 18- or 20- gauge needle for IV access, use filter tubing

(NOTE: Always assess the integrity of IV site before administration of blood products)

Table one: Blood Components

Product	Adverse Reactions	Nursing Considerations
Packed red blood cells	Less common/ Allergic reaction	Compatible solution- 0.9% NACL Monitor client during transfusion Administered over 2-4 hours
Platelets	Febrile reactions	Standard blood filter tubing Compatible solution- 0.9% NACL Nonwettable filter
Plasma	Volume overload risk	Infuse 4 Units/hr (cannot bolus) Administer with straight line set Can bolus infusion in patients in which coagulation factors become unstable

Albumin	Volume overload risk	25% albumin given at 1ml/min Can be used as a bolus in patients with patients in shock
Prothrombin	Risk for hepatitis, allergic reaction	Straight line infusion set
Factor VIII	Allergic and febrile reaction	Drip set or syringe

Table 2 Blood Group Compatibility

Blood Group	Donor	Recipient
A	A, AB	O, A
B	B, AB	O, B
AB	AB	O, A, B, AB
O	O, A, B, AB	O

Nursing Interventions for administering blood products:

1) Ask client about allergies or previous blood transfusion reaction

2) Ensure blood compatibility via type and screen prior to administration

3) Check the line for air bubbles

4) Check blood by two nurses:

- Providers order
- Client consent
- Client ID and MRN number
- Blood type

5) Obtain baseline vital signs

6) Prime tubing with 0.9% NACL

7) Start infusion at a slow rate and stay with client for the first 15 minutes

8) Recheck vital signs 15 minutes after transfusion has started

9) If no reaction, increase infusion rate (2 hours/unit) depending on patients cardiovascular status, however, infuse blood products at (4 hours/unit) for elderly patients

10) Vital signs every hour

11) Ask client to report any itching, shortness of breath or flank pain over the kidneys

12) Note: Change entire IV tubing for each unit of blood

If transfusion reaction is suspected:

- Immediately **stop** blood transfusion
- Restart 0.9% NACL
- Notify the health care provider
- Return blood products and blood tubing to blood bank
- Obtain CBC, culture and retyping
- Collect Urine sample and monitor for hematuria

Table 3 Blood transfusion reactions

Reaction Type	Cause	Symptoms	Nursing Interventions
Allergic reaction/ Hypersensitivity	Hypersensitivity to antibodies present donors blood	Mild- itching, flushing, inurticaria	Prevention with premedication of antihistamines
		Anaphylaxis- dyspnea, hypotension, flushing	Stop transfusion and infuse 0.9% NACL
			Notify MD
			Supportive care: Antihistamines, oxygen, corticosteroids

Acute IntravascularBlood incompatibility hemolytic reaction		Nausea, vomiting, hypotension, tachycardia, fever, lower back pain, hematuria	Stop transfusion Notify MD Supportive care: Manage airway, oxygen, antihistamines
Febrile nonhemolyticMost common reaction reaction	Antibodies to donor platelets or leukocytes	Nausea, chills, fever, flushing, tachycardia	Stop transfusion Notify MD Antipyretics Sometimes seen with clients after administration of multiple transfusions
Sepsis	Contaminated bloodproducts	Hypotension, tachycardia, high fever, shock	Stop transfusion Notify MD

		Obtain blood cultures
		Antibiotic therapy, IV fluids, vasopressors, corticosteroids
Circulatory overload	Large volume in a shortCrackles, dyspnea amount of time	Decrease Infusion rate
		Administer Diuretics if appropriate
		Monitor high risk clients (elderly, heart disease, children)

Autologous transfusion- Individuals donate their own blood to be given, usually 4-6 weeks before a surgical procedure.

- Prevents viral infection from donated blood
- Useful in clients with a history of transfusion reactions
- Rare blood type

Contraindicated in clients with:

- Acute infection
- Chronic comorbidities
- Vascular disease
- Hemaglobin less than 11 g/L or hematocrit less than 33%

General view for Hematological Disorders

Sickle Cell Anemia constitutes a group of diseases termed hemoglobinopathies, in which hemoglobin A is partly or completely replaced by abnormal sickle hemoglobin S.

Sickledex is frequently used because it can be performed on blood from a fingerstick and yields accurate results in 3 minutes.

Sickling response is reversible under conditions of adequate oxygenation and hydration; after repeated sickling, the cell becomes permanently sickled.

Precipitating Factors:

" Fe-E-D-O2 "

- **Fe**ver
- **E**motional or physical stress
- **D**ehydration
- **Oxygen** deprivation

Sickle Cell Crisis:

Vaso-Occlusive Crisis caused by stasis of blood with clumping of cells in the microcirculation, ischemia, and infarction

Manifestations: Fever; painful swelling of hands, feet, and joints; and abdominal pain

Splenic Sequestration caused by pooling and clumping of blood in the spleen (hypersplenism)

Manifestations: Profound anemia, hypovolemia, and shock

Hyperhemolytic Crisis an accelerated rate of red blood cell destruction

Manifestations: Anemia, jaundice, and reticulocytosis

Aplastic Crisis caused by diminished production and increased destruction of red blood cells, triggered by viral infection or depletion of folic acid

Manifestations: Profound anemia and pallor

Nursing Interventions:

- Maintain adequate hydration
- Administer oxygen and blood transfusions as prescribed
- Administer analgesics as prescribed (around the clock)
- Provide comfort and rest
- **Diet:** high-calorie, high protein diet, with folic acid supplementation
- Administer antibiotics as prescribed
- Ensure that the child receives pneumococcal and meningococcal vaccines and an annual influenza vaccine
- Monitor for **signs of complications**: increasing anemia, decreased perfusion, and shock (mental status changes, pallor, vital sign changes).

Avoid meperidine for pain *is avoided because of the risk of normeperidine-induced seizures.*

Iron Deficiency Anemia red blood cells are ***"microcytic and hypochromic";*** depleted iron production, resulting in a decreased supply of iron for the manufacture of hemoglobin in red blood

cells.

Signs and Symptoms:

- Pallor
- Weakness and fatigue
- Low hemoglobin and hematocrit levels

Nursing Interventions:

- Increase oral intake of iron; iron-fortified formula or supplements
- Diet: Iron rich foods
- *Iron supplements administration:*

- Give *between meals*
- Give *with multivitamin or fruit juice* to increase absorption
- Do NOt give with *milk or antacids*
- Can cause (black stools, constipation, and foul aftertaste)
- Use straw when administering liquid iron supplements
- Instruct good oral hygiene

Aplastic Anemia red blood cells are ***"normocytic and normochromic"*** *but would be reduced in number (rbc,wbc,pc).*

Signs and Symptoms:

" 4PS "

- **P**ancytopenia (deficiency of erythrocytes, leukocytes, and thrombocytes)
- **P**allor
- **P**urpura
- **P**etechiae

Nursing Interventions:

- Prepare the child for bone marrow transplantation
- Administer immunosuppressive medications as prescribed *(Corticosteroids and cyclosporine)*
- Administer blood transfusions if prescribed and monitor for transfusion reactions

Hemophilia a bleeding disorder resulting from a deficiency of specific coagulation proteins (clotting factor VIII hemophilia A or Classic hemophilia and IX hemophilia B or Christmas disease. X-linked recessive disorder; Male (affected) **>** Female (carrier).

Signs and Symptoms:

- Abnormal bleeding in response to trauma or surgery (sometimes after circumcision)

- Epistaxis (nosebleeds)
- Joint bleeding causing pain, tenderness, swelling, and limited range of motion
- Ecchymosis

Nursing Interventions:

- Maintain bleeding precautions
- Avoidance of contact sports
- Prepare to administer factor VIII concentrates
- DDAVP (1-deamino-8-D-arginine vasopressin), a synthetic form of vasopressin, increases plasma factor VIII to treat mild hemophilia.
- Monitor for joint pain; immobilize the affected extremity if joint pain occurs.
- Assess neurological status (child is at risk for intracranial hemorrhage)
- Monitor urine for hematuria
- Control joint bleeding; apply pressure (15 minutes) for superficial bleeding

von Willebrand's Disease is a hereditary bleeding disorder that is characterized by a deficiency of or a defect in a protein termed von Willebrand factor.

Signs and Symptoms:

" EEEG "

- **E**pistaxis
- **E**asy bruising
- **E**xcessive menstrual bleeding
- **G**um bleeding

Nursing Interventions:

- Similar care as to hemophilia
- Provide emotional support especially during acute attack