มหาวิทยาลัยราชภัฏนครปฐม
Nakhon Pathom Rajabhat University

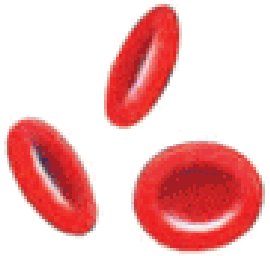
Nursing care of patients with hematologic and lymphatic disorders

Dr.Korawan Suwannasarn

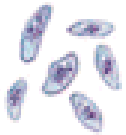
Learning Objectives

1. Explain the principles of nursing for patients with hematologic and lymphatic disorders
2. Apply nursing care plan to patients with hematologic and lymphatic disorders.

RED BLOOD CELLS (ERYTHROCYTES)



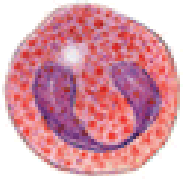
PLATELETS (THROMBOCYTES)



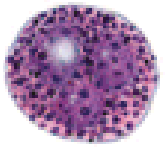
WHITE BLOOD CELLS (LEUKOCYTES)

Granular leukocytes

Neutrophil

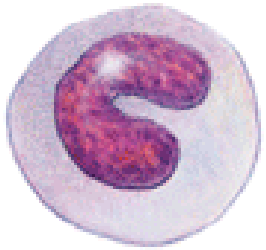


Eosinophil

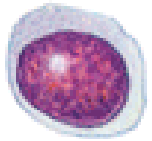


Basophil

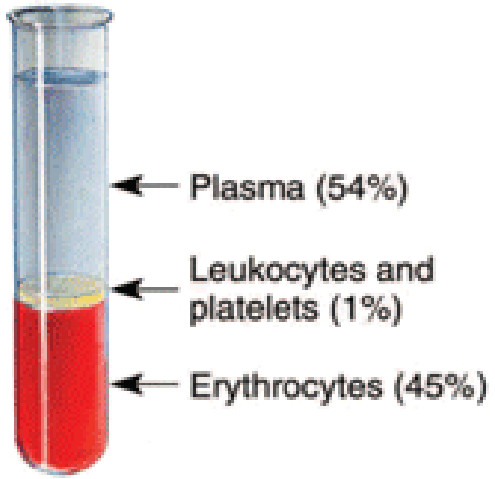
Agranular leukocytes



Monocyte

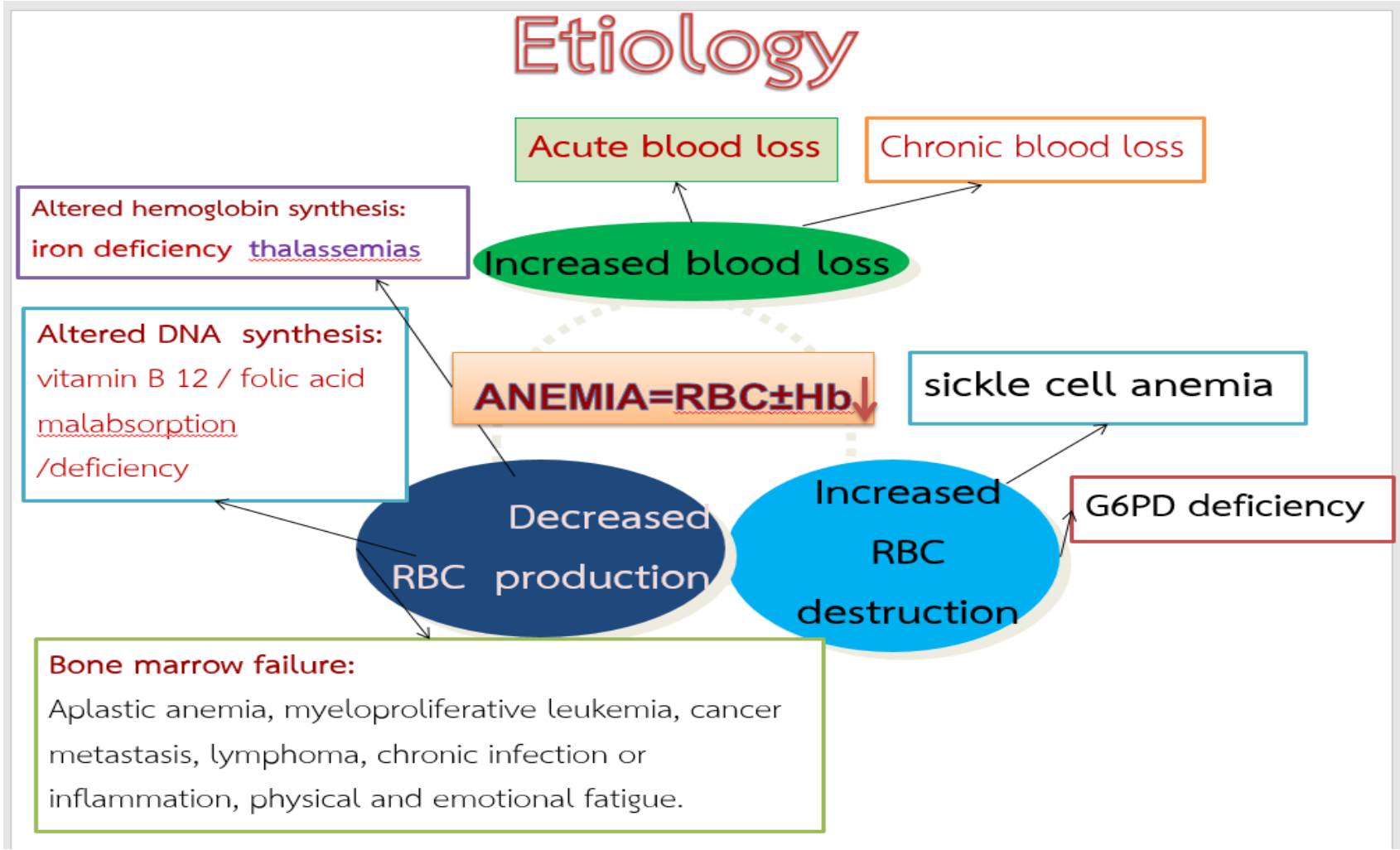


Lymphocyte



Normal laboratory values for red blood cells

Lab test	Normal range	definition
RBC count		
Men	4.2-5.4 million/mm^3	
Women	3.6-5.0 million/mm^3	
Reticulocytes	1.0-1.5% of total RBC	Immature RBCs
Hemoglobin		
Men	14-16.5 g/dL	
Women	12-15 g/dL	
Hematocrit		Packed volume of RBCs in 100
Men	40-50%	ml of blood expressed as a
Women	37-47%	percentage
Mean corpus volume (MCV)	85-100 femtolitre/cell	Average vol. of individual RBCs
Mean corpus hemoglobin concentration (MCHC)	31-35 g/dL	Average concentration / percentage of Hb per RBC
Mean corpus hemoglobin (MCH)	27-34 pg/ cell	Calculated average weight of Hb per RBC


Etiology
Acute blood loss
Chronic blood loss
Altered hemoglobin synthesis:
iron deficiency thalassemias
Increased blood loss
Altered DNA synthesis:
vitamin B 12 / folic acid
malabsorption
/deficiency
ANEMIA=RBC±Hb↓
sickle cell anemia
Decreased
RBC production
Increased
RBC
destruction
G6PD deficiency
Bone marrow failure:
Aplastic anemia, myeloproliferative leukemia, cancer metastasis, lymphoma, chronic infection or inflammation, physical and emotional fatigue.

Signs and symptoms

Mild; Hb=10-14 g/dl; headache, palpitation, dyspnea

moderate; Hb=6-10 g/dl;pallor,fatigue,dizziness, faintness

Severe; sensitivity to cold, blurred vision,pallor, pruritis, glossitis, smooth tongue,tachycardia, widened pulse pressure, CHF, tachypnea, orthopnea, anorexia, enlarged liver&spleen,bone pain, headache, dizziness, impaired thinking, depression, fatigue

Acute blood loss

10% none

20% slight postural hypotension

40% below normal blood pressure,

rapid pulse, cold clammy skin

50% shock

Chronic blood loss

- depletes iron stores as RBCs production attempts to maintain the RBC supply. The resulting RBCs are microcytic (small) and hypochromic (pale)

Iron deficiency anemia

- It develops when the supply of iron is inadequate for optimal RBC formation.
- The body cannot synthesize hemoglobin without iron.
- It results in fewer numbers of RBCs, microcytic and hypochromic RBCs, as well as malformed RBCs (poikilocytosis)

Causes of iron deficiency anemia

- Dietary deficiency
- Decreased absorption: partial or total gastrectomy, chronic diarrhea, malabsorption syndrome.
- Increased metabolic requirements: pregnancy, lactation.
- Blood loss: gastrointestinal bleeding, menstrual losses.
- Chronic hemoglobinuria.

Vitamin B 12 deficiency anemia

- impair cell division and maturation.
- As a result, macrocytic, misshapen (oval rather than concave)
- RBCs with thin membrane are produce.
- Great numbers of these large, immature RBCs enter the circulation.
- These cells are, fragile, incapable of carrying adequate amounts of oxygen, and have a shorten life span.
- Failure to absorb dietary vitamin B12 is called pernicious anemia. It develops due to lack of *intrinsic factor*

Causes of vitamin B 12 deficiency anemia

- Inadequate vitamin B12 intake; usually occurring only among strict vegetarians.
- Poorly absorption; resection of the stomach or ileum, loss of pancreatic secretion, chronic gastritis

Folic acid deficiency anemia

- Like vitamin B12, folic acid is required for DNA synthesis and normal maturation of RBCs.
- Folic acid deficiency anemia is characterized by fragile, megaloblastic cells.

Causes of folic acid deficiency anemia

- Inadequate dietary intake at risk: older adults, alcoholics, clients receiving total parenteral nutrition.
- Increased metabolic requirement at risk: pregnant women, infants and teenagers, clients undergoing hemodialysis, clients with forms of hemolytic anemia.
- Folic acid malabsorption and impaired metabolism: chemotherapeutic agents, folate antagonists (methotrexate, pentamidine) or anticonvulsants, alcoholism.

Dietary sources

- Iron= meat, egg yolk, oysters, dried beans, dried fruits, brown rice, greens.*[enhance by V.C, inhibited by tea&coffee]*
- Folic acid= green leafy vegetables, broccoli, organ meat, eggs, wheat germ, asparagus, liver, milk, yeast, fruits, cereals, and meats,
- B12=liver, fresh shrimp&oysters, eggs, milk, kidney, meats, cheese and dairy products.

Aplastic anemia

- The bone marrow fails to produce all three types of blood cells; leading to *pancytopenia*.

50% = *idiopathic aplastic anemia*

50%=follow stem cell damage; radiation, chemical substance [benzene, arsenic, nitrogen mustard, certain antibiotics, chloramphenicol], chemotherapeutic drugs, viral infections [mononucleosis, hepatitis C, and HIV disease]

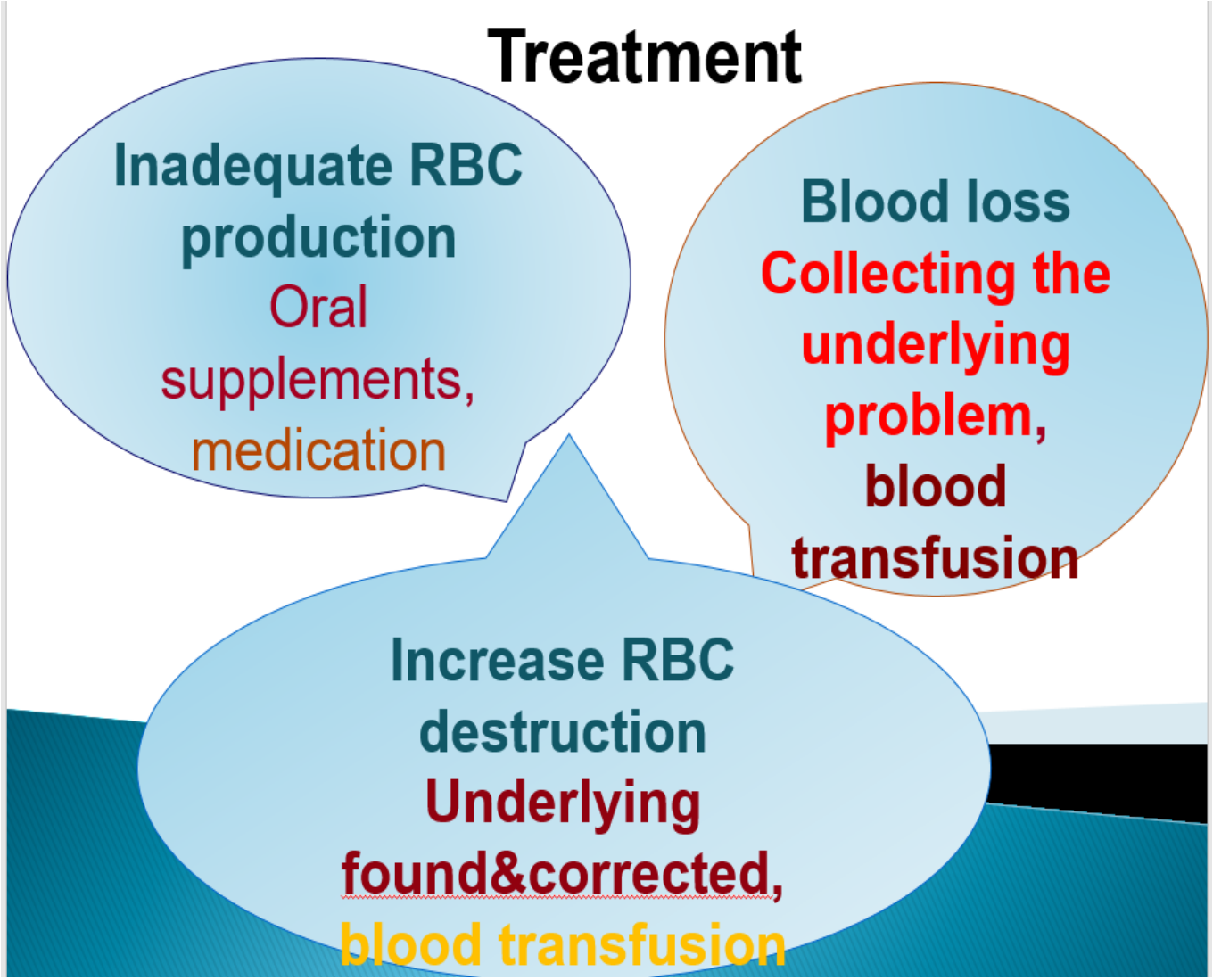
Aplastic anemia

Signs & symptoms

- fatigue
- Pallor
- progressive weakness
- exertional dyspnea
- headache
- Tachycardia
- heart failure
- bleeding problems
- increases the risk of infection.

Diagnostic tests

- *Complete blood count=scan*
- *Iron levels and total iron-binding capacity=* iron deficiency
- *Serum ferritin=* iron deficiency
- *Schilling test=B12 def*
- *Bone marrow examination*


Treatment
Inadequate RBC production
Oral supplements, medication
Blood loss
Collecting the underlying problem, blood transfusion
Increase RBC destruction
Underlying found&corrected,
blood transfusion

Nursing diagnoses and intervention

1. Activity intolerance

intervention

-identify way to conserve energy when performing

-assist to develop a schedule of activity and rest periods.

-8-10 hr. to sleep at night.

-monitor vital signs before and after activity.

-discontinue activity if; chest pain, breathlessness, vertigo, palpation, bradycardia, tachypnea, dyspnea, decrease SBP.

-do not smoke.

Nursing diagnoses and intervention

2. Impaired oral mucous membrane [def. iron, B12]

intervention

-monitor condition of lips and tongue daily.

-mouthwash of saline, saltwater, half-strength peroxide every 2-4 hr.

-frequent oral hygiene with soft bristle toothbrush/ sponge.

-apply a petroleum-based lubricating ointment/ jelly.

-Avoid spicy, hot, acidic foods.

-soft, cool, bland foods.

-4-6 small meals dairy with high protein & vitamin.

Nursing diagnoses and intervention

3.Risk of decreased cardiac output

-monitor vital signs.

-assess for pallor, cyanosis, dependent edema from right ventricular failure.

4. Self -care deficit

-assist with ADLs.

Thrombocytopenia

=platelet count < 100,000 / mm^3

Platelet count=150,000-400,000 / mm^3

Risk of bleeding disorder

- 50,000-100,000/ mm^3 mild
- 20,000-50,000/ mm^3
- below 20,000/ mm^3

Causes

- Leukemia, Aplastic anemia,
- Chemotherapy, Radiation therapy
- Heparin, Aspirin, Ibuprofen, Furosemide

Treatment

- Oral glucocorticoids [prednisolone]
- Immunosuppressive drugs [azathioprine, cyclophosphamide, cyclosporine]
- Platelet transfusion
- Plasmapheresis
- Splenectomy

Nursing diagnoses and interventions

- Ineffective protection

  interventions

  -monitor vital signs and bleeding.

  -apply pressure to puncture sites 3-5 minutes.

  -instruct to avoid activities that increase external and internal bleeding.

Nursing diagnoses and interventions

- Impaired oral mucous membranes

  interventions

  -assess the mouth for bleeding.

  -soft-bristle toothbrush.

  -rinse the mouth with saline every2-4 hr.

  -apply petroleum jelly to lips.

  -avoid alcohol-based mouthwash.

Nursing diagnoses and interventions

Fear

- Encourage the client and family to verbalize concerns.
- Answer questions truthfully.
- Provide emotional support.
- Respond promptly when the client calls for help.
- Teach relaxation techniques.

leukemia

classification	characteristics	manifestations	treatment
Acute lymphoblastic leukemia	Children, young adults	Infection, bleeding, pallor, bone pain, weight loss, sore throat,fatigue, night sweat, weakness	Chemotherapy, BMT,stem cell transplant [SCT]
Chronic lymphoblastic leukemia	adults	fatigue, exercise intolerance, splenomegaly,infection,edema, thrombophlebitis	Chemotherapy, BMT
Acute myelocytic leukemia	Older adults	fatigue, fever, anemia, headache, bone&joint pain, abn. bleeding,hepatosplenomegaly, lymphadenopathy	Chemotherapy,stem cell transplant
Chronic myelocytic leukemia	Adults [Philadelphia chromosome]	Early;Fatigue, weakness, dyspnea on exertion, splenomegaly, later;fever , weight loss, night sweat	Interferon-alpha, Chemotherapy,stem cell transplant

Diagnostic findings

test	AML	CML	ALL	CLL
RBC count	low	Low	Low	Low
Hb	Low	Low	Low	Low
Hct	Low	Low	Low	Low
Plt. count	Very low	High ealry,low late	Low	Low
WBC count	Varies	Increased	Varies	Increased
myeloblasts	Present			
neutrophils	Decreased	Increased	Decreased	Normal
lymphocytes		Normal		Increased
monocytes		Normal/ low		
blasts	Present	Present [crisis]	Present	
Bone marrow	Hypercellular		Hypercellular	
myeloblasts	present			
lymphoblasts			present	
lymphocytes				present

Treatment

- Chemotherapy
- Radiation therapy
- Bone marrow transplantation
- Leukapheresis
- Splenectomy

Nursing diagnoses and intervention

- Risk for infection

  <u>interventions</u>

  -promptly report manifestations of infection.

  -infection protection: isolation as indicated, handwashing, hygiene, restriction of visitors with colds/ flu, and avoidance of invasive procedures.

  -vital signs.

  -monitor neutrophils > 2,000-2,500 =no risk

  >1,000-2,000 minimal risk

  >500-1,000 moderate risk

  >below 500 severe risk

Nursing diagnoses and intervention

- Imbalance nutrition: less than body requirement

  <u>interventions</u>

  -weigh regularly.

  -address factors to inadequate food & fluid; mouth care, increase liquid, clean & free odor, antiemetic, supplement.

Nursing diagnoses and intervention

- **Impaired oral mucous membrane**

  <u>interventions</u>

  -inspect.

  -culture.

  -mouth care [saline,H_2O_2 1:1/ 1:3]

  -soft bristle.

  -medication.

  -avoid alcohol-base mouthwash/ hot/ spicy/ crusty/ very cool foods.

Nursing diagnoses and intervention

- Anticipatory grieving

  <u>interventions</u>

  -assess coping in the past.

  -provide information; self-help group.

Lymphoma

- Hodgkin’s lymphoma
- Non Hodgkin’s lymphoma
- Multiple myeloma

Feature of manifestation	Hodgkin's disease	Non-Hodgkin's lymphoma
age	15-35, over 50	Older adult
gender	Men>women	Men>women
Reed-Sternberg cells	√	-
lymphadenopathy	Localized to a single, painlessly often cervical, subclavicular, mediastinal	Multiple peripheral nodes, nodes of the mesentery often involved
spread	Orderly and continuous	Diffuse and unpredictable
Extranodal involvement	rare	Early and common
Bone marrow involvement	uncommon	common
Fever, Night sweat, weight loss	common	Uncommon until disease is extensive
Other manifestation	fatigue, pruritis, splenomegaly, malaise, anemia, neutrophilia	Abdominal pain, nausea, vomiting, dyspnea, cough, CNS symptoms, lymohocytopenia

Diagnostic tests

CBC

Hodgkin's disease:normochromic, normocytic anemia, high neutrophil&eosinophil, elevated sed rate.

Non-Hodgkin's lymphoma;remain normal until late in the disease pancytopenia.

Chest X-ray; identify enlarged mediastinal LN and pulmonary involvement

Chest or abdominal CT scan; identify abnormal or enlarge LN

Bipedal lymphangiography; identify the extent of iliac, para-aortic, and abdominal LN involvement

Biopsy of the largest, most central enlarged LN; the presence of Reed-Sternberg cells confirms "Hodgkin's disease"

Treatment

- Chemotherapy
- Radiation therapy

Nursing diagnoses and intervention

- Nausea

  Interventions

  - -assess precipitating factors.
  - Avoid unpleasant odor.
  - Small feedings high-kcal, protein, fluid.
  - Oral care.
  - Prefer food.

Nursing diagnoses and intervention

- Disturbed body image

  Interventions

  - assess perception of body image.
  - cope with alopecia .
- Risk for impaired skin integrity

  Interventions

  - assess skin
  - promote comfort and release itching.

References

กรวรรณ สุวรรณสาร. (2565). *การพยาบาลผู้ใหญ่ระบบโลหิตและน้ำเหลือง [เอกสารที่ไม่ได้ตีพิมพ์]*. คณะพยาบาลศาสตร์, มหาวิทยาลัยราชภัฏนครปฐม.

ผ่องพรรณ อรุณแสง. (บรรณาธิการ). (2561). *การประเมินภาวะสุขภาพผู้ใหญ่และผู้สูงอายุ : การประยุกต์ใช้ในการพยาบาล*. คณะพยาบาลศาสตร์ มหาวิทยาลัยขอนแก่น.

Rebecca, M.P., & Cynthia, D. (2018). Interprofessional collaboration for perioperative patients, In D.D. Ignatavicius, M.L. Workman, &, C.R. Rebar (Eds.), *Medical-Surgical Nursing: Concepts for interprofessional collaborative care*, volume 2 (9th ed., pp.228-270) Elsevier Inc.