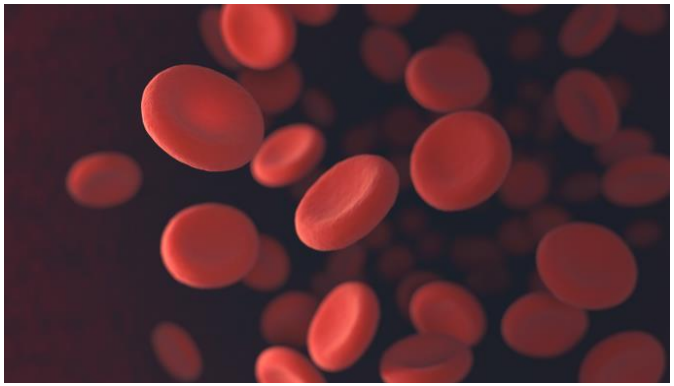
ANEMIA

Union Clinical Laboratory

20160215

Section of Hematology and Clinical Microscopy

貧血概論



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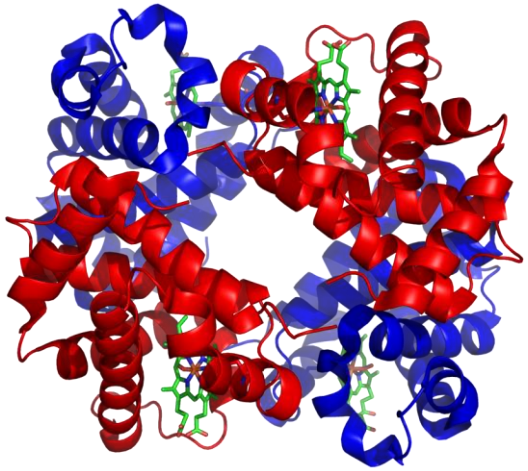
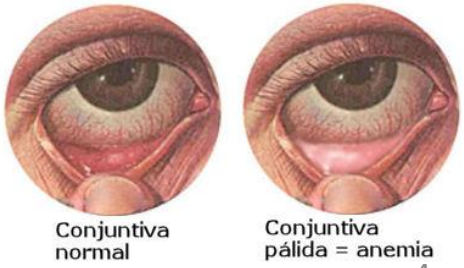
何謂貧血

- 血液中的紅血球細胞數目減少、血色素降低或血容積減少的狀態



貧血症狀

1. 皮膚：臉色蒼白；皮膚乾燥、泛白、失去光澤；嘴唇泛白；手部掌紋泛白。
2. 眼睛：眼瞼結膜呈白色；溶血性貧血時鞏膜呈黃色。
3. 口腔：嘴唇及口腔黏膜泛白。
4. 舌頭：舌面光滑、舌炎或舌乳突減少。
5. 指甲：失去光澤、泛白且變薄、斷裂；前端向外彎曲；有的甚至呈湯匙狀。
6. 頭髮：頭髮乾燥、脫落



貧血症狀

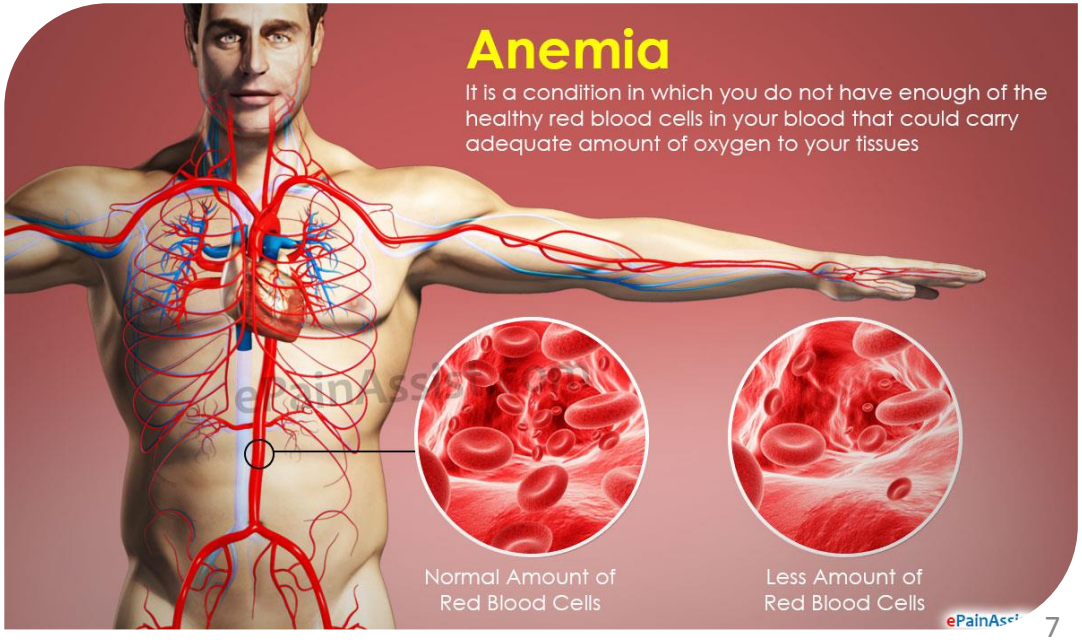
1. 心臟：心悸、氣喘、心慌、心跳加快、心臟擴大，心衰竭
2. 腦部：嗜睡、頭暈、記憶力減退、注意力不集中
3. 消化系統：食慾不振、胃液分泌不足，胃炎

貧血高風險因子

- 育齡期婦女
- 素食
- 速食主義
- 濫用藥物
- 腎功能衰退
- 腸胃潰瘍
- 甲狀腺機能亢進或低下

貧血的原因

- 健康紅血球的生產量減少
- 血液流失
- 紅血球的破壞增加



健康紅血球的生產量減少

1. 骨髓內的紅血球生成減少：缺鐵性貧血、地中海型貧血

2. 骨髓紅血球生產不良：骨髓分化不良症候群、巨芽母球性貧血

3. 骨髓內的紅血球生產減少：再生不良性貧血

4. 造血幹細胞異常：癌症、淋巴癌、多發性骨髓瘤

5. 慢性疾病：腎臟疾病、代謝性疾病、發炎。

6.老化

血液流失

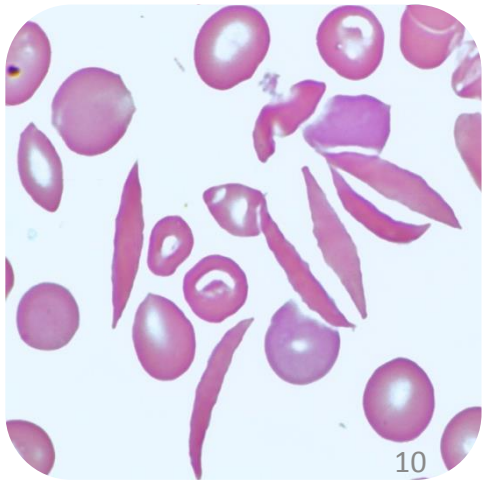
1. 腸胃道：痔瘡，腸胃炎，癌症
2. 藥物： N-SAIDs
3. 月經
4. 多胞胎產婦

aspirin

ibuprofen

紅血球的破壞增加- 內因性

1. 紅血球胞膜性病變：
   遺傳性球狀紅血球症、遺傳性橢圓狀紅血球症、陣發性夜間血紅素尿症
2. 血紅素性病變：
   鐮刀狀紅血球貧血、不穩定血紅素
3. 酵素缺乏：
   G-6-PD 、 Pyruvate kinase



紅血球的破壞增加-外因性

1. 免疫性：
   自體免疫、藥物
2. 血管病變：
   血栓性血小板缺乏紫斑症、溶血性尿毒症候群、心瓣膜置換術
3. 感染症
4. 脾臟機能亢進症

貧血定義-CBC

410	RBC(10^3/ul)	**380**
13.5	HB(g/dL)	**12**
40	HCT(%)	**35**

出自台北榮民總醫院內科部血液科
Guideline for treatment of anemia

貧血分類

- Mean Corposcular Volume (MCV)
- **小球性貧血**：缺鐵性貧血、地中海型貧血、慢性疾病所產生之貧血、及鐵芽球性貧血。
- **正球性貧血**：骨髓內的生產減少（再生不良性貧血、白血病、淋巴癌、多發性骨髓瘤）、腎臟疾病、代謝性疾病、及發炎性疾病等等。
- **大球性貧血**：巨芽球性貧血、網狀紅血球增生性貧血、骨髓分化不良症候群、及肝臟疾病。

實驗室檢查

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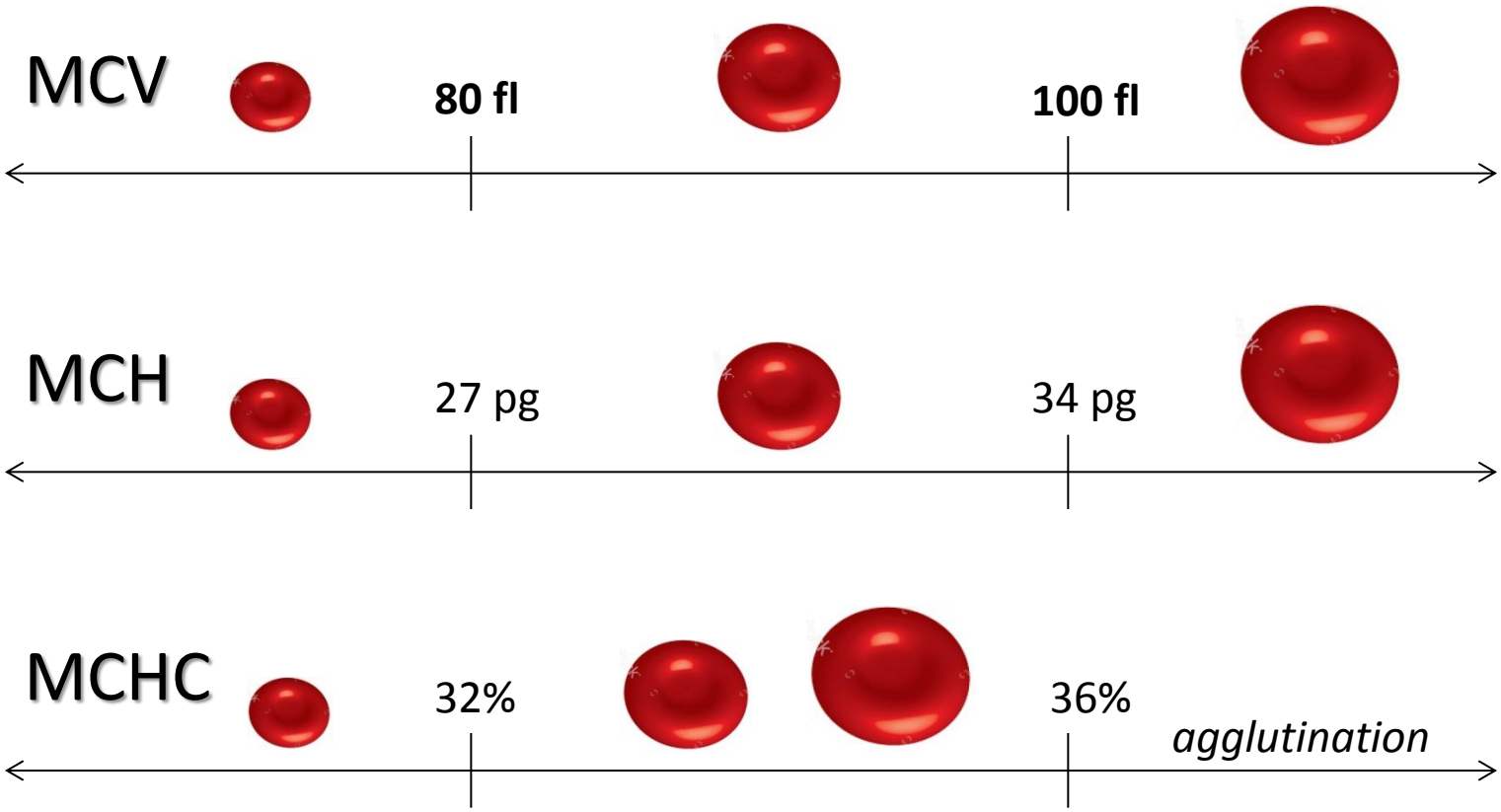
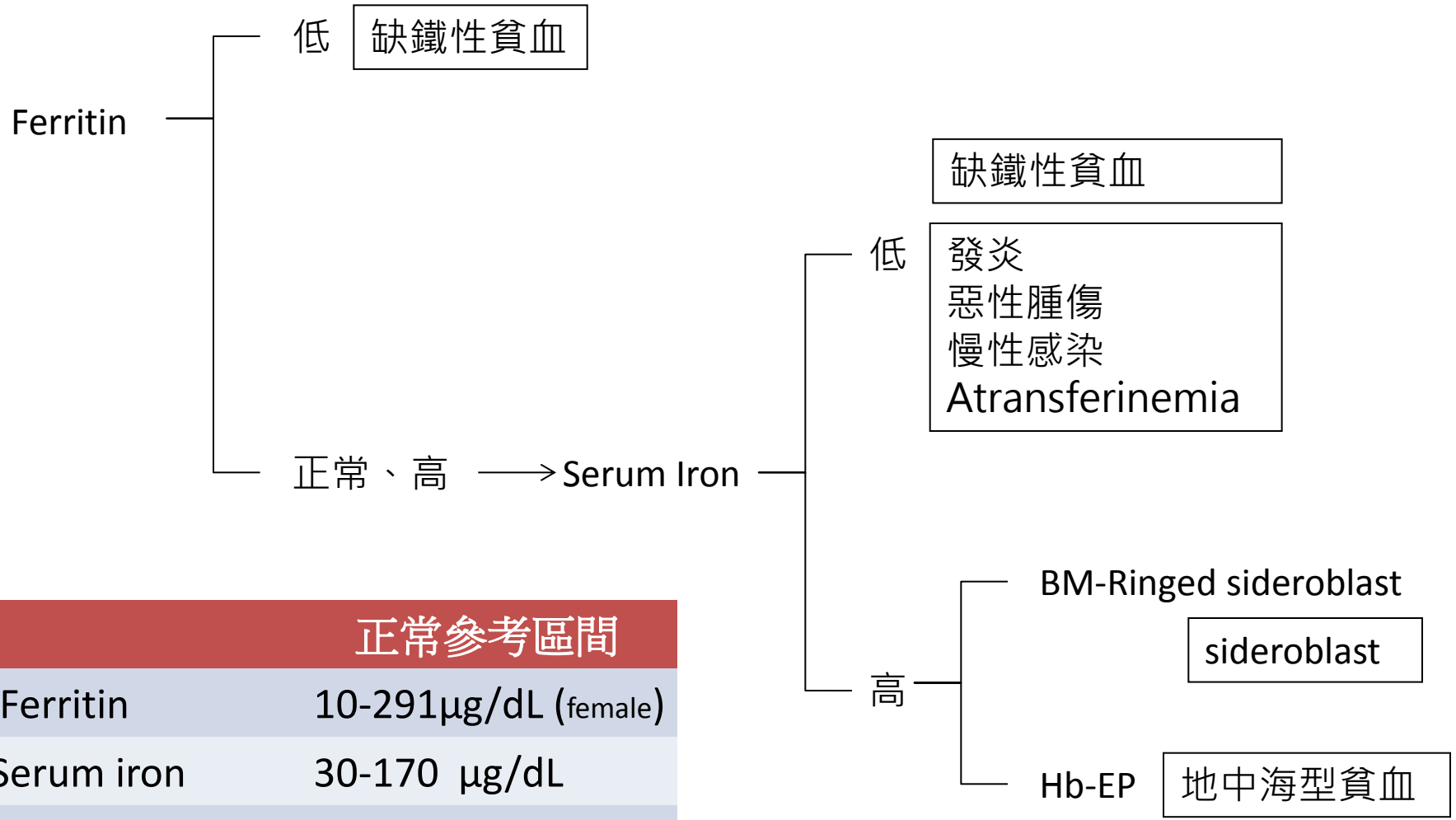
morphological classification

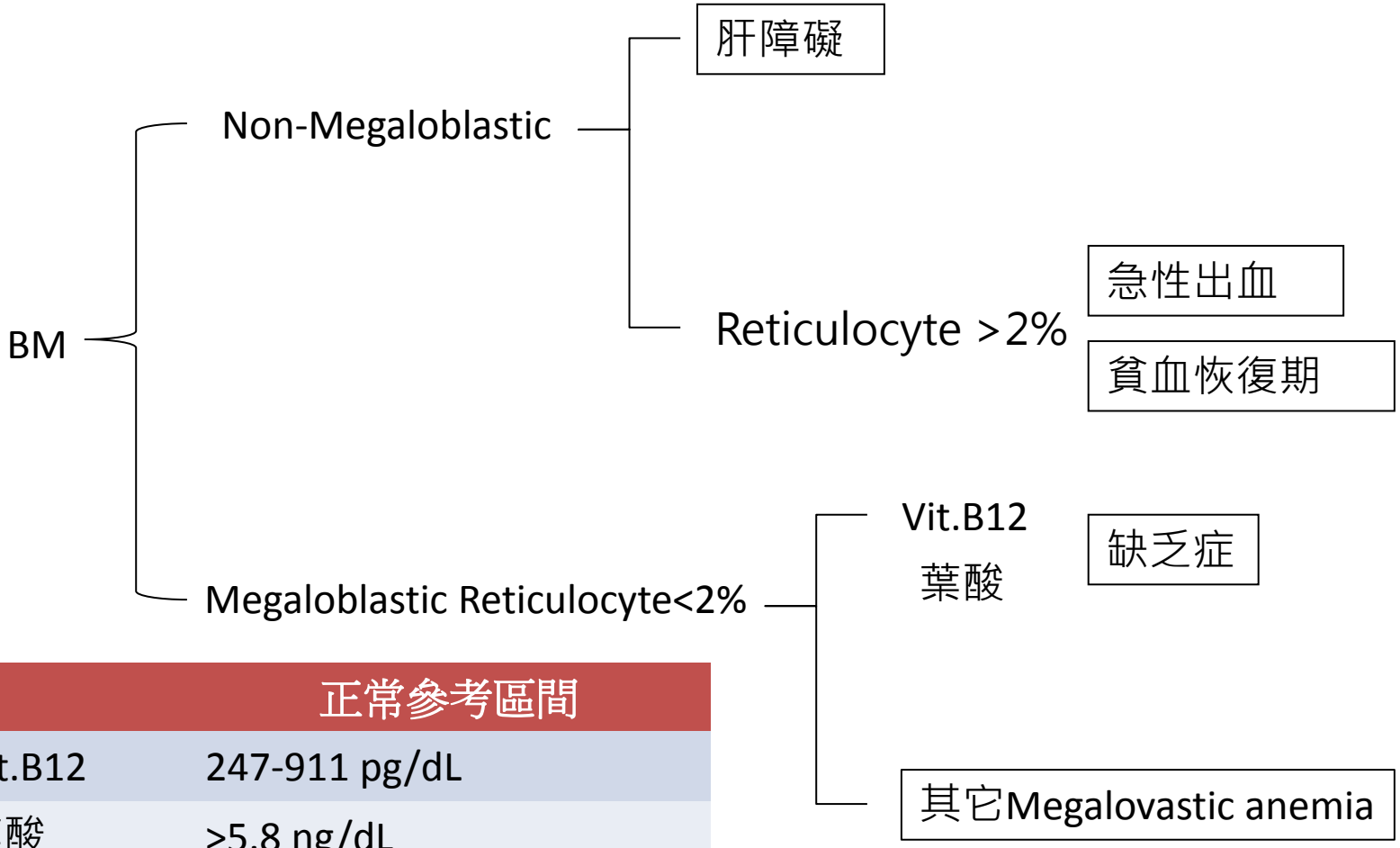


Microcytic anemia



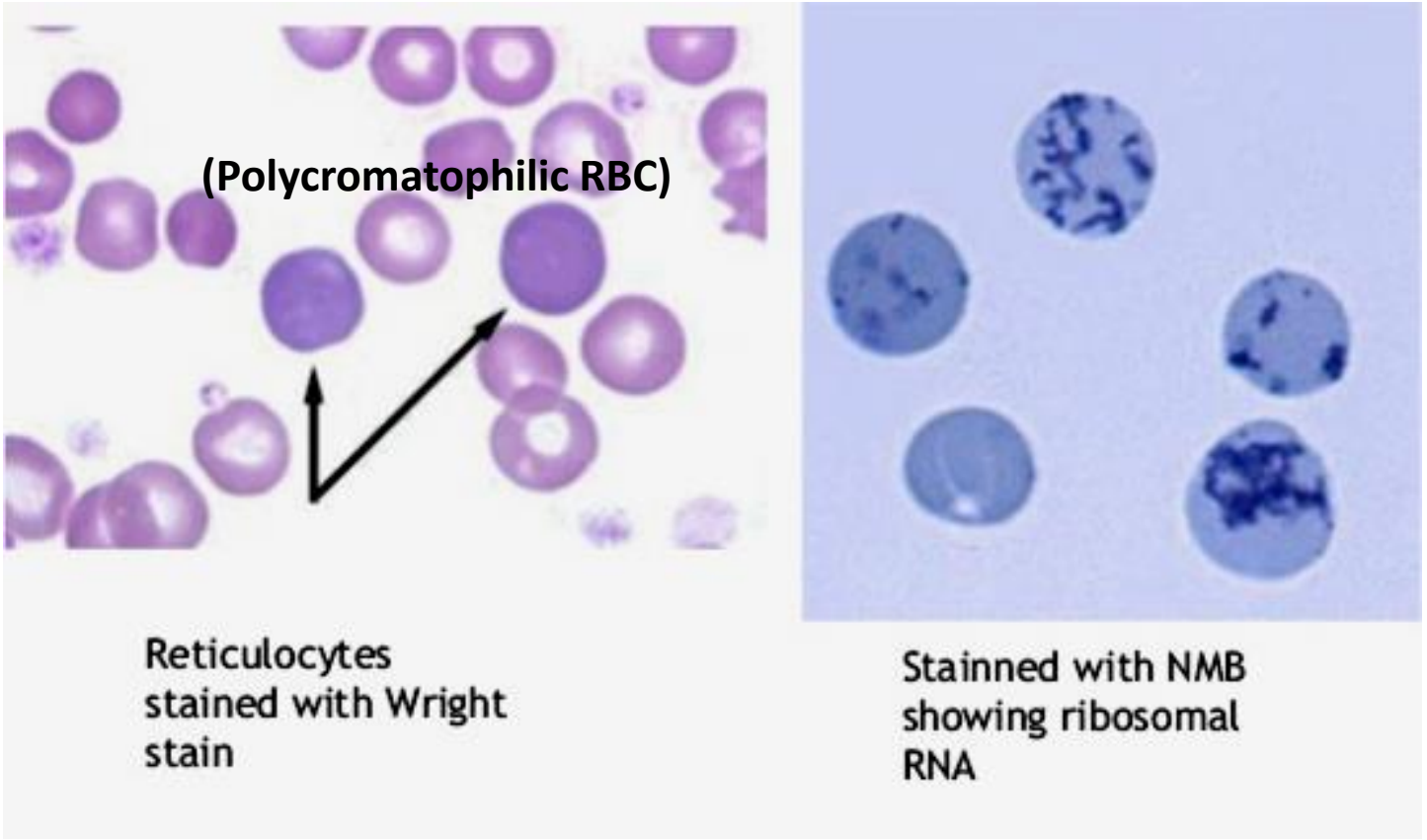
	正常參考區間
Ferritin	10-291μg/dL (female)
Serum iron	30-170 μg/dL
TIBC	200-340 μg/dL

Marcocytic anemia

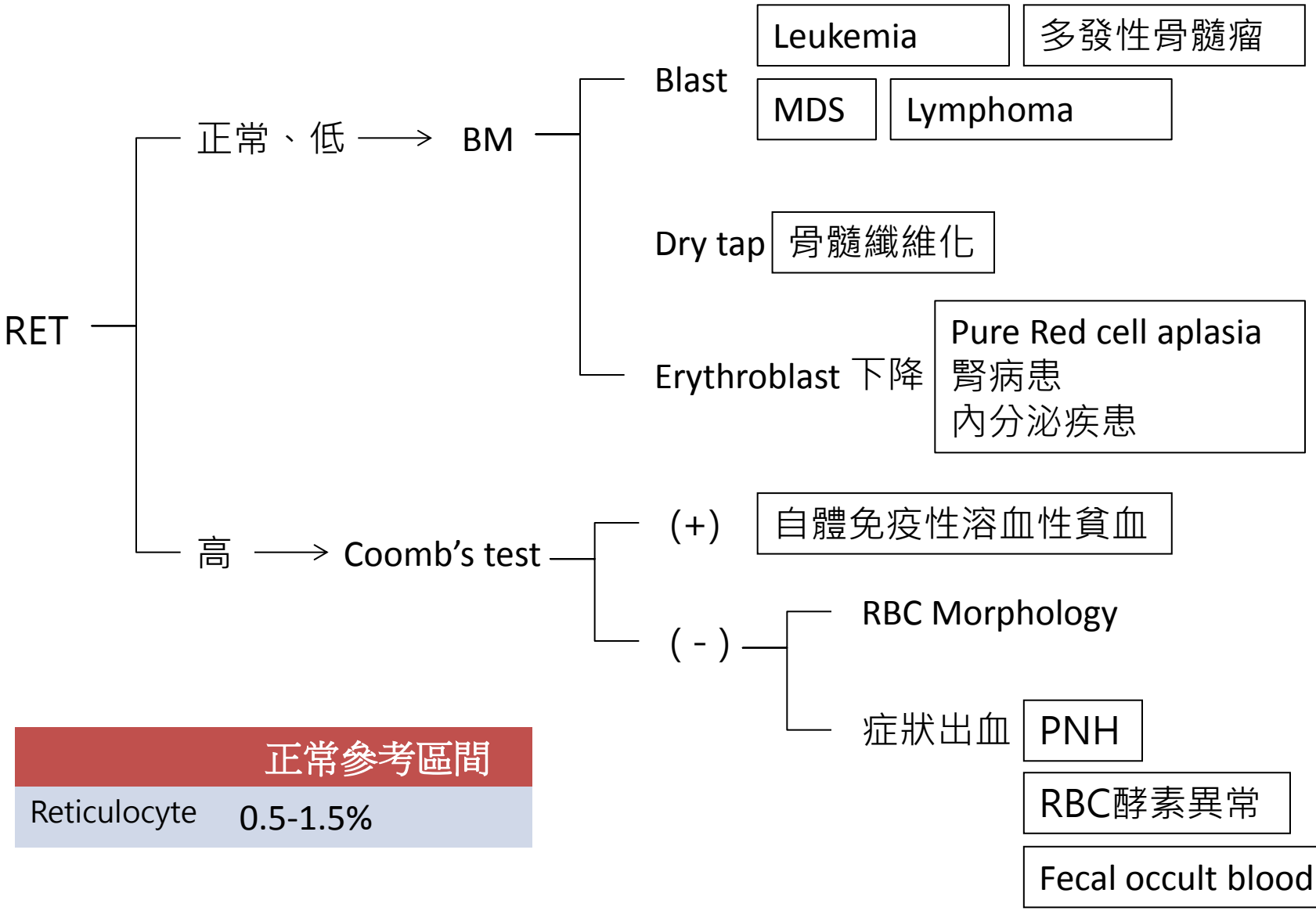


	正常參考區間
Vit.B12	247-911 pg/dL
葉酸	>5.8 ng/dL
Reticulocyte	0.5-1.5%

Reticulocyte count

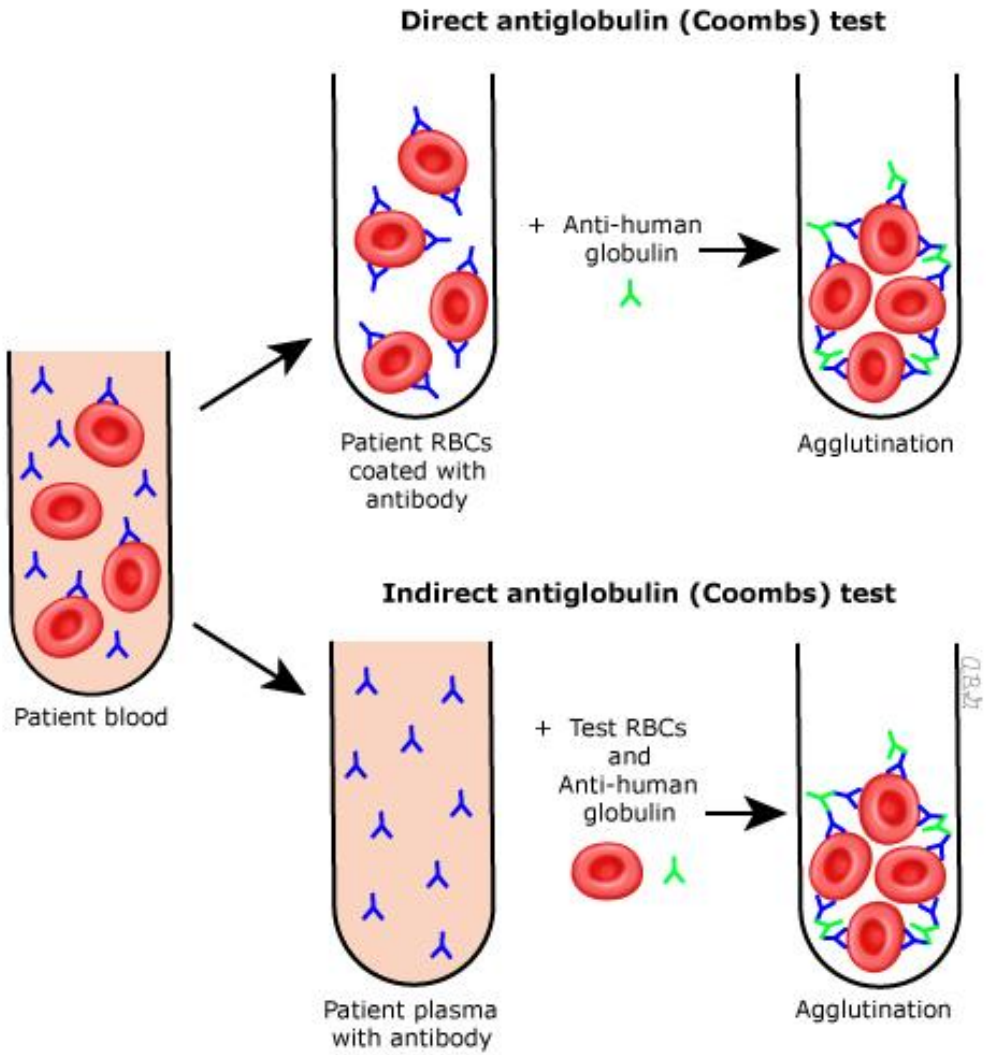


Normocytic anemia



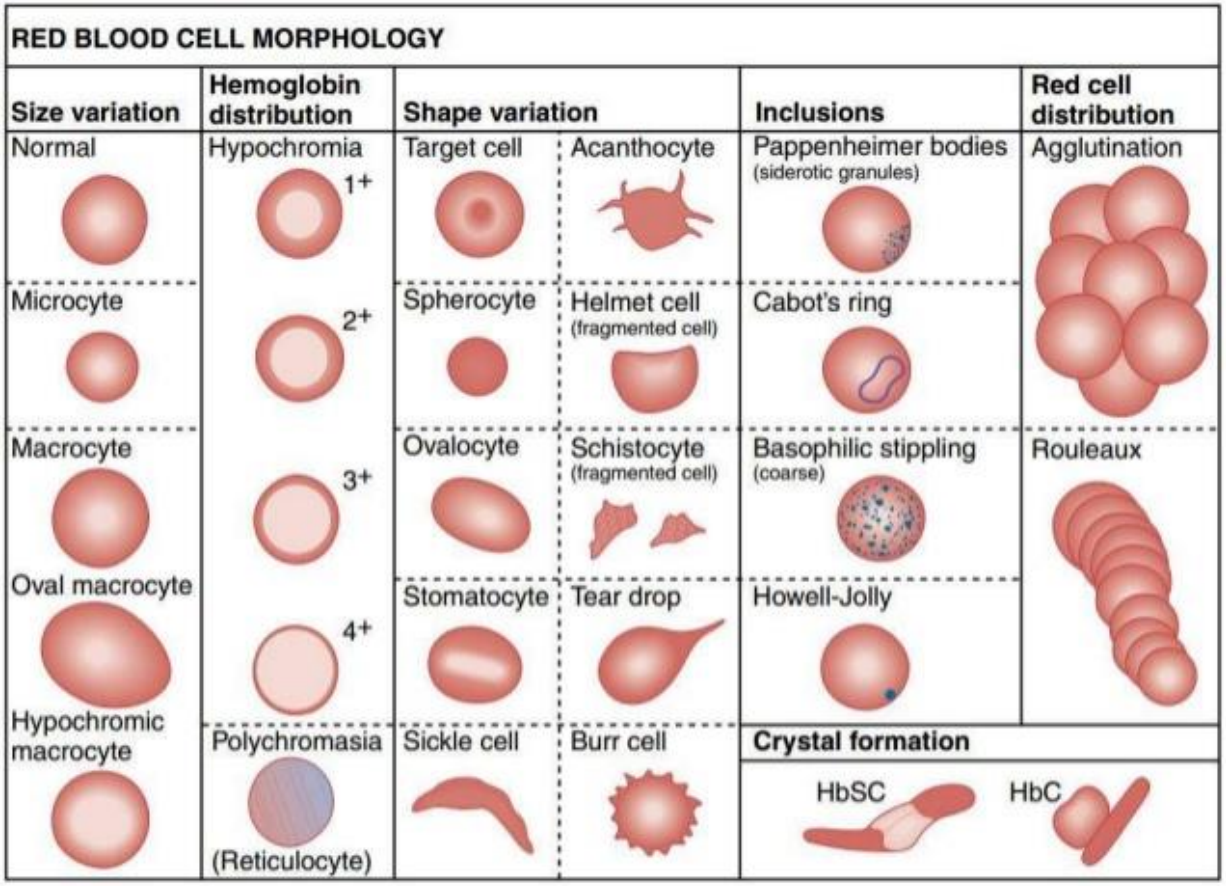
	正常參考區間
Reticulocyte	0.5-1.5%

Coomb's test

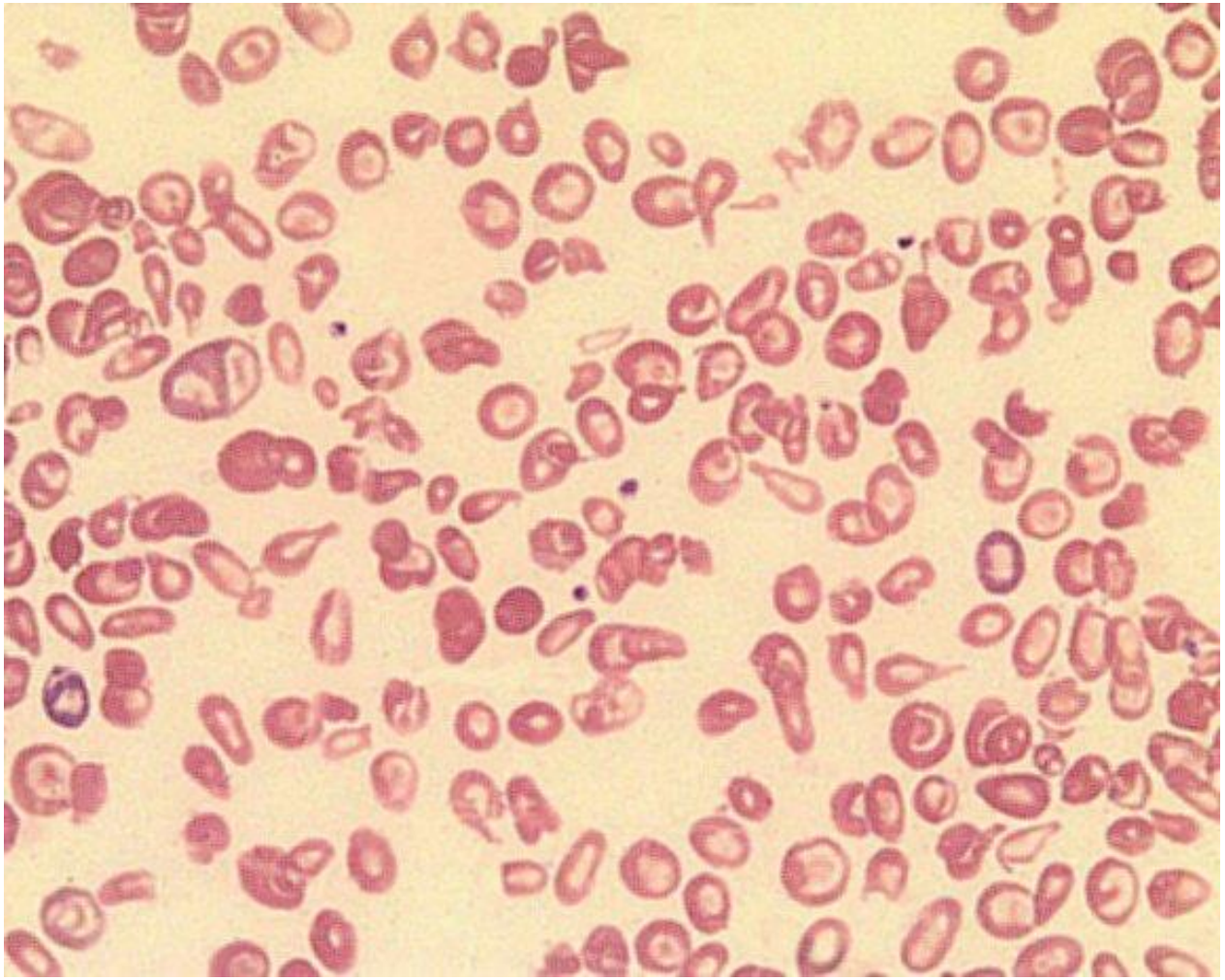

Direct antiglobulin (Coombs) test
+ Anti-human globulin
Patient RBCs coated with antibody
Agglutination
Patient blood
Indirect antiglobulin (Coombs) test
+ Test RBCs and Anti-human globulin
Patient plasma with antibody
Agglutination

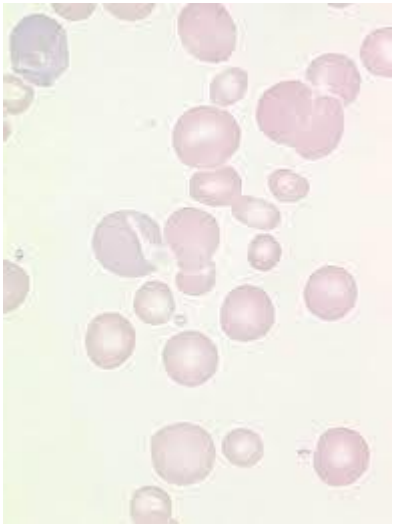
RBC Morphology

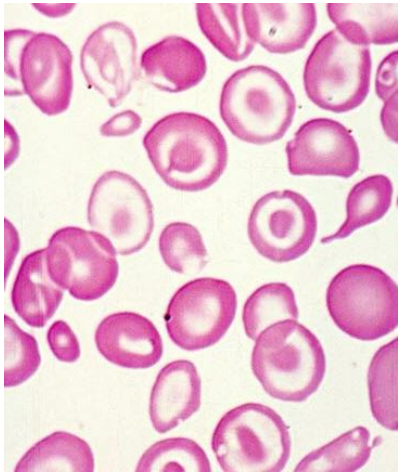
遺傳性球狀紅血球症
遺傳性橢圓狀紅血球症
鐮狀紅血球症
無β-脂蛋白血症(棘狀)
中度地中海貧血(靶狀)
G-6PD缺乏症(Heinz小體)
細血管異常性溶血性貧血
骨髓纖維症(Poikilocytosis)



Poikilocytosis







其他輔助性檢查

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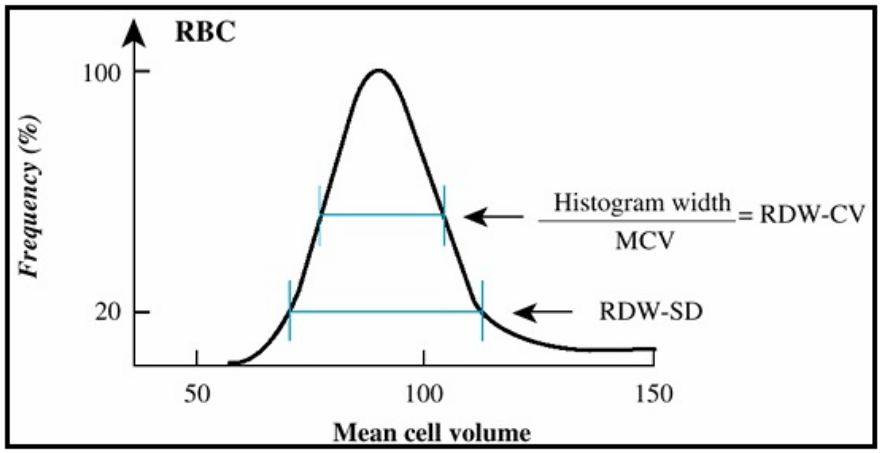
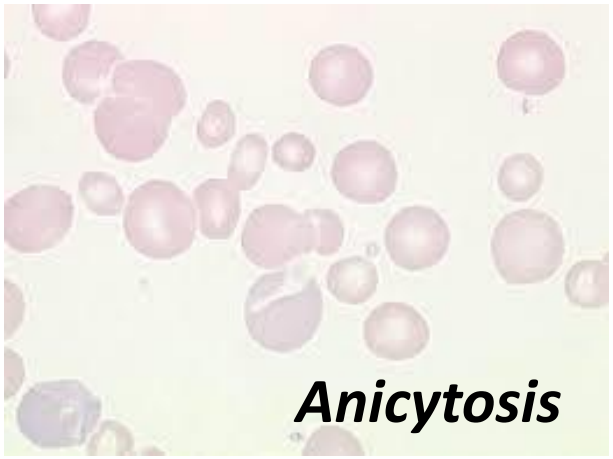
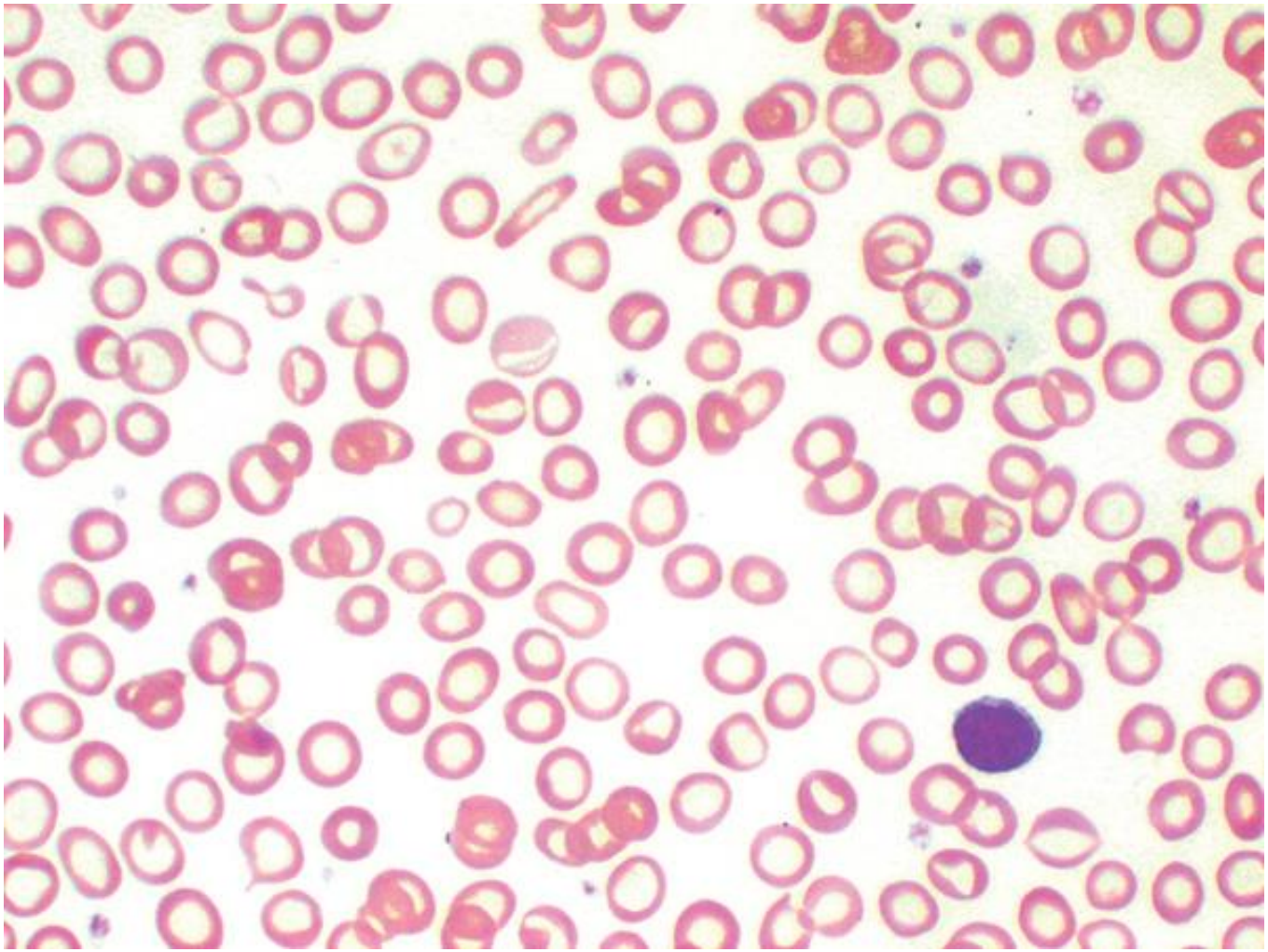
RDW-CV / Anisocytosis





MCV	RDW	貧血類型	舉例
N	N	正常細胞	急性失血
	↑	正常細胞/ 大小不一	aplastic anemia 、 G6PD 、 PNH
↑	N	大細胞	少數 aplastic anemia
	↑	大細胞/大小不一	MDS 、 megaloblastic anemia
↓	N	小細胞	thalassemia 、 hereditary spherocytosis(HS)
	↑	小細胞 /大小不一	iron deficiency anemia(IDA)

RDW-CV



Iron Deficiency Anemia

✓缺鐵性貧血時RDW會增加；輕度地中海型貧血，88%RDW正常，而中度和重度地中海型貧血的RDW會增加。

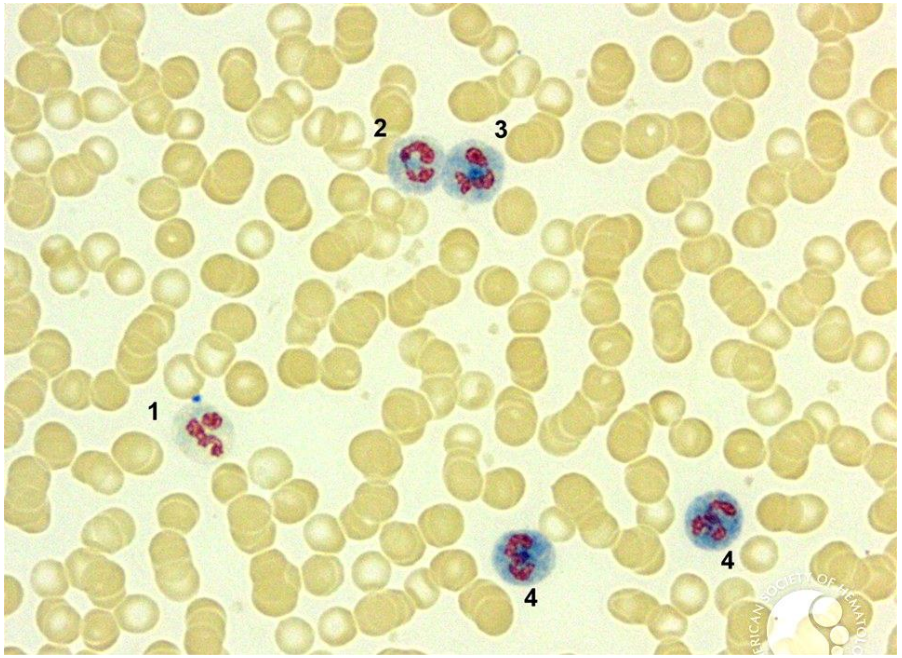
✓RDW可區分缺鐵性貧血與輕度地中海型貧血。

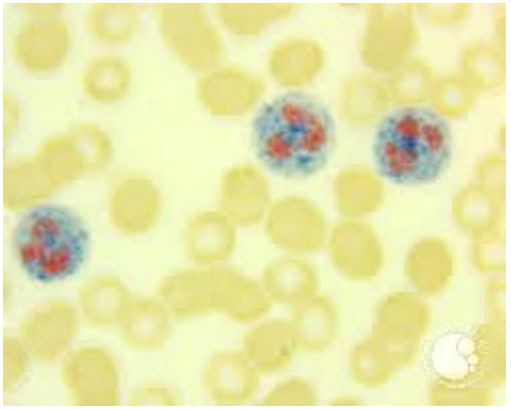
	參考區間
RDW-CV	<15%

LAP score

區別炎症之類白血病反應與慢性骨髓性白血病（CML）

- 增加：妊娠真性多血症、續發性多血症、再生不良性貧血、骨髓纖維化
- 減少：惡性貧血、骨髓不良症候群、陣發性夜間血紅素尿症等。

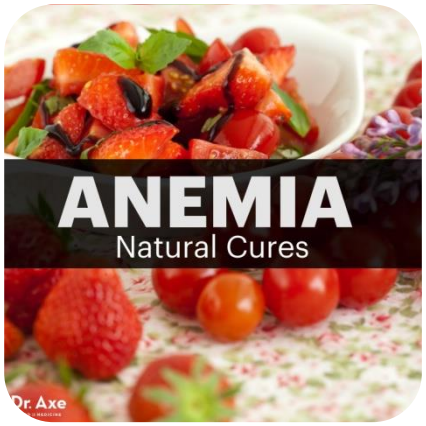




	參考區間
LAP score	40-100 score

Living With Anemia

- **Treatment ： Medicines、transfusion 、 transplant**
- Treating your anemia and eating a well-rounded diet can give you more energy and enhance your life.
- some foods and medicines can hinder iron uptake when taken with iron-rich foods. They include:
  - ✓Dairy
  - ✓Other calcium-rich foods
  - ✓Calcium supplements
  - ✓Antacids
  - ✓Coffee
  - ✓Tea



What UCL can provide ?

血液學

- CBC/DC
- RBC morphology
- Reticulocyte
- Coomb’s test
- LAP score

生化學

- 鐵4項
- Vit.B12
- folic acid
- Hb-EP
- Hb H stain
- Bilirubin

Reference

- http://www.webmd.com
  Anemia Causes, Types, Symptoms, Diet, and Treatment SOURCES: American Academy of Family Physicians. The American Medical Athletic Association. Albemarle Pulmonary Medical Associates,Reviewed by Melinda Ratini, DO, MS on March 04, 2015
- Guideline for treatment of anemia 北榮 | 何照洪 游介宇
- 高點建國醫護網
- 臨床血液學 | 何敏夫

THANKS FOR YOUR ATTENTION

Q & A

Sickle cell anemia

- is an inherited disorder that, in the U.S. affects mainly African-Americans and Hispanic Americans. Red blood cells become crescent-shaped because of a genetic defect. They break down rapidly, so oxygen does not get to the body's organs, causing anemia. The crescent-shaped red blood cells can also get stuck in tiny blood vessels, causing pain.

Iron-deficiency anemia

- occurs because of a lack of the mineral iron in the body. Bone marrow in the center of the bone needs iron to make hemoglobin, the part of the red blood cell that transports oxygen to the body's organs. Without adequate iron, the body cannot produce enough hemoglobin for red blood cells. The result is iron-deficiency anemia. This type of anemia can be caused by:

Iron-deficiency anemia

- An iron-poor diet, especially in infants, children, teens, vegans, and vegetarians
- The metabolic demands of pregnancy and breastfeeding that deplete a woman's iron stores
- Menstruation
- Frequent blood donation
- Endurance training
- Digestive conditions such as Crohn's disease or surgical removal of part of the stomach or small intestine
- Certain drugs, foods, and caffeinated drinks

Vitamin-deficiency anemia

- may occur when vitamin B12 and folate are deficient. These two vitamins are needed to make red blood cells. Conditions leading to anemia caused by vitamin deficiency include:

Vitamin-deficiency anemia

- Megaloblastic anemia: Vitamin B12 or folate or both are deficient
- Pernicious anemia: Poor vitamin B12 absorption caused by conditions such as Crohn's disease, an intestinal parasite infection, surgical removal of part of the stomach or intestine, or infection with HIV
- Dietary deficiency: Eating little or no meat may cause a lack of vitamin B12, while overcooking or eating too few vegetables may cause a folate deficiency.
- Other causes of vitamin deficiency: pregnancy, certain medications,alcohol abuse, intestinal diseases such as tropical sprue and celiac disease

Bone marrow and stem cell problems

- may prevent the body from producing enough red blood cells. Some of the stem cells found in bone marrow develop into red blood cells. If stem cells are too few, defective, or replaced by other cells such as metastatic cancer cells, anemia may result. Anemia resulting from bone marrow or stem cell problems include:
- Aplastic anemia occurs when there's a marked reduction in the number of stem cells or absence of these cells. Aplastic anemia can be inherited, can occur without apparent cause, or can occur when the bone marrow is injured by medications, radiation,chemotherapy, or infection.
- Thalassemia occurs when the red cells can't mature and grow properly. Thalassemia is an inherited condition that typically affects people of Mediterranean, African, Middle Eastern, and Southeast Asian descent. This condition can range in severity from mild to life-threatening; the most severe form is called Cooley's anemia.
- Lead exposure is toxic to the bone marrow, leading to fewer red blood cells. Lead poisoning occurs in adults from work-related exposure and in children who eat paint chips, for example. Improperly glazed pottery can also taint food and liquids with lead.