Data Interpretation 1

Anemia

HGB less than 120 g/L

- **Microcytic** e.g. Iron Deficiency Anemia (IDA) and Thalassemia.
- **Normocytic** e.g. Anemia of Chronic Diseases and Aplastic Anemia (pancytopenia).
- **Macrocytic** e.g.Vit B12 Deficiency. Other type of Anemia: o Hemolytic Anemia e.g. Sickle Cell Anemia SCA and Glucose -6- phosphate Dehydrogenase Deficiency (G6PD deficiency)

Microcytic	Normcytic	Macrocytic
MCV	MCV	MCV
less than 80 fl	b/t 80-94 fl	more than 94 fl

Red Cell Distribution Width (RDW):

When increased reflect heterogeneity in cell Size or **indicating low serum iron level**.

Microcytosis: low MCV

	Serum Iron	Ferritin
IDA (Iron Deficiency Anemia)	Low	Low
Thalassaemia Minor	Normal	Normal

- Iron Defeciency Anaemia:

✓ Oral iron therapy, characterized by a modest reticulocytosis beginning in about five to seven days, followed by an increase in hemoglobin at a rate of about **2** to **4** **g/dL** every three weeks until the hemoglobin concentration returns to normal.

✓ The serum or plasma ferritin concentration is an excellent indicator of iron stores.

✓ Patient with Iron deficiency anemia not response to treatment mean: - Don't take the medication - Malabsorption (give I.V.)

1. A 37- year- old lady, presents with 3 months H/O dizziness and easy fatigue. The following **CBC** is shown below:

WBC	7. 0		4– 11 x10.e9/L
RBC	**3. 68**	L	4.2 – 5.5 x10.e12/L
HGB	**87**	L	120 – 160 g/L
HCT	27.1	L	42 – 52 %
MCV	**73.6**	L	80 – 94 fl
MCH	**23.6**	L	27 – 32 pg
MCHC	321		320 – 360 g/L
RDW	**15.5**	H	11.5 – 14.5 %
PLT	445	H	140 – 450 x10.e9/L

Interpretation of the CBC:
- RBC, HGB and HCT are low → Anemia.
- MCV is low → Microcytic.
- MCH is low → Hypochromic.
- RDW is high → Serum Iron is low

- **Diagnosis**: Hypochromic Microcytic Anaemia (IDA)
  - DDX: Diet, **GI bleeding**, medication e.g. **aspirin**, and malabsorption.
  - On systemic enquiry, she added that she has **menorrhagia** for the last 4 months.
- **Mention one investigation of importance to reach the diagnosis.**

  -TSH : 89 mIU/L (0.25 – 5)

  -FT4 : 8.6 pmol/l (10.3—25 .8)

→ Primary Hypothyroidism

- **Treatment:**
  - Thyroxine, iron supplement **(ferrous sulfate or ferrous fumarat)** and folic acid. We treat usually at least 4 to 6 months. Stop the treatment when the **Ferritin** become in normal range.

2. A 16-year-old girl presents with 2 m H/O dizziness, palpitation and recurrent faints. The following CBC is shown below:

WBC	**8.1**		4– 11 x10.e9/L
RBC	**1.42**	L	4.2 – 5.5x10.e12/L
HGB	**24**	L	120 – 160 g/L
HCT	**8.0**	L	37 – 47 %
MCV	**56**	L	80 – 94 fl
MCH	**16.6**	L	27 – 32 pg
MCHC	**295**	L	320 – 360 g/L
RDW	**22.9**	H	11.5 – 14.5 %
PLT	**181**		140 – 450 x10.e9/L
Retic. Count	**3.5**	H	0.2 - 2.0 %

Interpretation of the CBC:

- RBC, HGB and HCT are low → Anemia.
- MCV is low → Microcytic.
- MCH is low → Hypochromic.
- RDW is high → Serum Iron is low
- Retic.count High → Immature RBC

- **Diagnosis:** Microcytic Hypochromic Anemia, severe Iron deficiency anemia.
  - ✓ Most common cause is Menstrual Cycle Disturbances (Very common in this age).
- **How are you going to manage this patient?**
  - ✓ Blood Transfusion, Admission
  - ✓ Treat the cause beside Iron and Folic A.

3. A 17 year old lady presents with dizziness and bouts of fall.

WBC 7.4 x10.e9/L	**4 -11**
RBC 3.57 x10.e12/L	**4.2 - 5.5**
HGB ..... 57 g/L	**120 -160**
HCT ..... 20.1 %	**37 - 47**
MCV ..... 56.2 fl	**80 - 94**
MCH ..... 15.9 pg	**27 - 32**
MCHC ..... 282 g/L	**320 - 360**
RDW ..... 25.0 %	**11.5 - 14.5**
PLT 578 x10.e9/L	**140 - 450**
Iron .....1.0 umol/L	**9 - 30**
Total Iron-Binding cap ..... 89.6 umol/L	**44.8 - 80.6**

Interpretation of the CBC:

- ✓ RBC, HGB and HCT are low → Anemia.
- ✓ MCV is low → Microcytic.
- ✓ MCH is low → Hypochromic.
- ✓ RDW is high → Serum Iron is low

- **Diagnosis** : Microcytic Hypochromic Anemia (Iron Deficiency Anemia)
- **Treatment** : Transfused (one pint of blood) and Put on :ferrous sulphate and folic acid

4. Cont. A 17 year old lady with low Hb, after 6 weeks. ((means 6 weeks after treatment))

WBC	8.4 x10.e9/L	4 -11
RBC	4.71 x10.e12/L	4.2 - 5.5
HGB	105 g/L	120 -160
HCT	32.5 %	37 - 47
MCV	68.9 fl	80 - 94
MCH	22.3 pg	27 - 32
MCHC	324 g/L	320 - 360
RDW	35.7 %	11.5 - 14.5
PLT	296 x10.e9/L	140 - 450
Ferritin	6.77 ug/L	13 -150

We ordered hemoglobin electrophoresis because we have high normal RBCs (4.7) in comparison to low HGB(105)

Hb Electrophoresis:

Hemoglobin A2	2.3 %	2.0 - 3.5
Hemoglobin F	0.0 %	0 - 2.0
Hemoglobin A	97.7%	95 - 99
Hemoglobin S	0.0	Normal

→ **All normal**

5. A 49- year- old lady, presents with 2 months H/O weakness and lethargy.The following CBC is shown below:

WBC	7. 8		4 – 11 x10.e9/L
RBC	4. 1	L	4.2 – 5.5 x10.e12/L
HGB	75	L	120 – 160 g/L
HCT	24.4	L	42 – 52 %
MCV	59.2	L	80 – 94 fl
MCH	18.2	L	27 – 32 pg
MCHC	308	L	320 – 360 g/L
RDW	20.0	H	11.5 – 14.5 %
PLT	530	H	140 – 450 x10.e9/L

- What is your diagnosis?

Hypochromic Microcytic Anaemia (IDA) and Th. Trait

Polycythaemia

○ Absolute Polycythaemia: (Red Cell mass ↑)

- Primary Polycythaemia Rubra Vera (↑ RBC, WBC and Platelets)
(Increase in RBCs with ↑in WBCs or ↑Platelets or both)

Lap. Features of Polycythaemia Rubra Vera:

- Increased in HB
- Increased in WBC (>12.000)
- Increased platelets (> 400.000) could be within normal level
- Increased uric acid
- Increased LAP (Leukocyte Alkaline Phosphatase) Score
- Increased serum Vit B12
- **Bone Marrow Examin. Hypercelularity**

Diagnostic criteria:

Major Criteria:

Elevated cell mass

Normal arterial oxygen concent. (≥ 92%)

Splenomegally

Minor Criteria:

Platelet count > 400.000

WBC count >12.000

↑ LAP Score

↑ B12 level

- Secondary Polycythaemia (next slide)

Polycythaemia

Secondary Polycythaemia: WBCs and Platelets are normal

- Smoking
- High altitude (Hx)
- Renal Cysts
- Hypernephroma
- Hepatoma
- COPD (clinically)
- Cyanotic Cong. H.D (clinically)
- Uterine Fibromyoma
- Adrenal adenoma
- Phaeochromocytoma

To role out the other causes of Secondary Polycythaemia:
Male: **abdominal US.**
Female: **abdominal & pelvic** US.

What is the role of erythropoietin?

- If the erythropoietin level is high: secondary polycythaemia
- If the erythropoietin level is low: polycythaemia rubra vera

○ Relative Polycythaemia: (GaisBock's)

- Normal Red Cell Mass
- Decrease in plasma volume
- Obese, middle aged men with anxiety and hypertension

1. A 55 year old man, who is a known case of hypertension controlled on 25 mg hydrochlorthiazide. He is a **smoker of 20 cig. per day for >20 years**. He came for routine follow up.

–	WBC.....6.5		4—11 x 10.e9/L
–	RBC.....7.1	H	4.7—6.1 x 10.e12/L
–	HB.....197	H	130—180 g/L
–	HCT.....56.3	H	42—52 %
–	MCV.....88		80 - 94 fl
–	MCH.....30.3		27 - 32 pg
–	PLT.....305		140 - 450 x 10.e9/L
–	ESR..... 4		0 - 10 mm/hr

- **What is the most likely diagnosis?**

2nd Polycythemia as WBCs and Platelets are normal

Mostly due to smoking (screen for other causes)

- **How are you going to manage this patient?**

Blood Donation, Stop smoking, **Aspirin**, shift to another antiHTN

2. A 64-year-old man presents with 3 month H/O
Dizziness and headache. His PMH: unremarkable O/E: plethoric and tip of the spleen is palpable. The following CBC is shown below.

WBC	21.8	4 – 11 x10.e9/L
RBC	8.59	4.7 – 6.1 x10.e12/L
HGB	213	130 – 180 g/L
HCT	66.6	42 – 52 %
MCV	81	80 – 94 fl
MCH	28.3	27 – 32 pg
MCHC	324	320 – 360 g/L
RDW	14.3	11.5 – 14.5 %
PLT	350	140 – 450 x10.e9/L
LAP SCORE.....	237	20 – 80

What is your diagnosis and action taken?

Polycythaemia Rubra Vera
Referral to Haematology, Bone marrow aspiration

3. A 53-year-old man booked for control of high blood pressure.

He used to smoke 20 – 40 cig. per day and cheesha.The following CBC is shown below:

#	Test		Result	Unit	Range
EDTA Whole Blood - SAMPLE: 1					
1	WBC	L	3.9	10.e9/L	4 - 11
2	RBC	H	7.18	10.e12/L	4.7 - 6.1
3	HGB	H	224	g/L	130 - 180
4	HCT	H	66.6	%	42 - 52
5	MCV		92.7	fl	80 - 94
6	MCH		31.3	pg	27 - 32
7	MCHC		337	g/L	320 - 360
8	RDW		13.7	%	11.5 - 14.5
9	HDW		0	g/L	-
10	PLT		163.0	10.e9/L	140 - 450

What is your diagnosis?

2nd Polycythemia

Think in causes: Smoking, COPD, Screen by doing U/S abdomen

Thalassaemia Minor

- Microcytosis is much more profound, and the anemia much milder, than that seen in iron deficiency anemia.
- Patients with beta thalassemia minor/trait also tend to have total red blood cell counts higher than normal, often into the "polycythaemic" range.
- The RDW in patients with thalassemia trait tends to be normal, since virtually all cells are hypochromic and microcytic.

- MCV usually **< 70 fL**
- The decrease in MCV is disproportionate to the HB level.
- Mentzer Index: MCV / RBC is **< 13**
- If RDW is high, Correct Iron level first before proceeding to HB electrophoresis, otherwise giving a false negative result.

- If HB A2 > 3.5 ⟶ B-Thalassaemia Minor
- If HB A2 is normal ⟶ alpha Thalassaemia Minor

1. A 25 year old man came for pre-marital checkup .The following CBC is shown below:

WBC	6.6		4 - 11 x 10.e 9/ L
RBC	**5.87**		4.7 – 6.1 x 10 .e12/L
HGB	**121**	L	130 – 180 g/L
HCT	38.1	L	42 - 52 %
MCV	**64.0**	L	80 – 94 fl
MCH	20.6	L	27 – 32 pg
MCHC	318	L	320 – 360 g/L
RDW	14.3		11.5 – 14.5 %
PLT	271		140 - 450 x 10.e9/L

Interpretation of the CBC:

- Low HB (slight), RBCs are high normal and **not matching with HB.** → Order Hg Electrophoresis
- The decrease in MCV is more and is disproportionate to the HB level

We order the Haemoglobin Electrophoresis.

Haemoglobin Electrophoresis

Hemoglobin A	94.5		(95 -99 %)
Hemoglobin F	0.6		(0 - 2.0 %)
Hemoglobin A2	**4.9**	**H**	**(2.0 -3.5 %)**
Hemoglobin S	0.0		
Hemoglobin E	0.0		
Hemoglobin C	0.0		

DDX : Beta-thalassemia minor

Treatment: Patient with Beta-thalassemia minor don't need to treatment.

2. A 34-year-old man came to check some of results because of being have IBS.

#	Test		Result	Unit	Range		
EDTA Whole Blood *- SAMPLE: 1*							
1	WBC		7.75	x10.e9/L	4	-	11
2	RBC		6.83	x10.e12/L	4.7	-	6.1
3	HGB		135.0	g/L	130	-	180
4	HCT	H	43.0	%	42	-	52
5	MCV		63.0	fl	80	-	94
6	MCH		19.8	pg	27	-	32
7	MCHC	L	314.0	g/L	320	-	360
8	RDW	L	16.20	%	11.5	-	14.5
9	PLT	L	175	x10.e9/L	140	-	450
		H					

- RBC High, MCV & MCH are Low, RDW is High.
- Not matching with HGB so, we order Haemoglobin Electrophoresis.

#	Test		Result	Unit	Range		
Venous Blood *- SAMPLE: 1*							
1	Hemoglobin A2		2.5	%	2.0	-	3.5
2	Hemoglobin F		0.50	%	0	-	2.0
3	Hemoglobin A		97.0	%	95	-	99
4	Hemoglobin S		0			-	
5	Hemoglobin C		0			-	
6	Hemoglobin E		0			-	
7	Hemoglobin O		0	%		-	

- HB A2 normal

DDX: Thalassemia Trait mostly “alpha Thalassemia” as Hb A2 is normal.

3. A 22 year old man followed for Hypothyroidism. The following CBC is shown below.

#	Test	Result	Unit	Range
EDTA Whole Blood *- SAMPLE: 1*				
1	WBC	11.6	x10.e9/L	4 - 11
2	RBC	2.3	x10.e12/L	4.7 - 6.1
3	HGB	82	g/L	130 - 180
4	HCT	22.1	%	42 - 52
5	MCV	98.1	fl	80 - 94
6	MCH	35.4	pg	27 - 32
7	MCHC	372	g/L	320 - 360
8	RDW	23.6	%	11.5 - 14.5
9	PLT	506	x10.e9/L	140 - 450

- RBC, HGB are low → Matching.
- MCV & MCH are high, RDW is High → Hemolysis

#	Test	Result	Unit	Range
Venous Blood *- SAMPLE: 1*				
1	Hemoglobin A2	2.6	%	2.0 - 3.5
2	Hemoglobin F	26.0	%	0 - 2.0
3	Hemoglobin A	0.0	%	95 - 99
4	Hemoglobin S	71.4		-
5	Hemoglobin C	0.0		-
6	Hemoglobin E	0.0		-
7	Hemoglobin O	0.0	%	-

DDX : Sickle Cell Anemia (SCA)

- Hydroxyurea promotes the production of foetal hemoglobin and can thus be used to treat sickle-cell disease.

5. A 31-year-old man presents with heart burn and known to have IBS. The following CBC is shown below.

#	Test	Result		Unit	Range
EDTA Whole Blood *- SAMPLE: 1*					
1	WBC	13.6		x10.e9/L	4 - 11
2	RBC	4.94	H	x10.e12/L	4.7 - 6.1
3	HGB	106		g/L	130 - 180
4	HCT	33.1	L	%	42 - 52
5	MCV	67.1	L	fl	80 - 94
6	MCH	21.4	L	pg	27 - 32
7	MCHC	319	L	g/L	320 - 360
8	RDW	19.7	L	%	11.5 - 14.5
9	HDW	0.0	H	g/L	0 - 0
10	PLT	375		x10.e9/L	140 - 450

- RBC not matching with HGB so → order Haemoglobin Electrophoresis.

#	Test	Result		Unit	Range
Venous Blood *- SAMPLE: 1*					
1	Hemoglobin A2	7.3	H	%	2.0 - 3.5
2	Hemoglobin F	5.2	H	%	0 - 2.0
3	Hemoglobin A	0.0	L	%	95 - 99
4	Hemoglobin S	87.5	H		-
5	Hemoglobin C	0.0			-
6	Hemoglobin E	0.0			-
7	Hemoglobin O	0.0		%	-

DDX: SCA and Beta Thalassaemia Trait

Treatment: Patient with SCA treat by hydroxyurea, which is increase HBF.

6. A 49-year-old woman presents with weakness and easy tiredness.

The following investigations are shown:

WBC 7.8		4	–	11	x10.e9/L
RBC 4.16		4.2	–	5.5	x10.e12/L
HGB 76	L	120	–	160	g/L
HCT 25.2	L	37	–	47	%
MCV 60.6	L	80	–	94	fl
MCH 18.3	L	27	–	32	pg
MCHC 303	L	320–		360	g/L
RDW 19.2	H	11.5 –		14.5	%
PLT 383		140 –		450	x10.e9/L

Interpretation of the CBC:

- RBC low normal,
- HB very low = no matching = thalassemia trait.
- very low serum iron, low ferritin, high TIBC = typical picture of iron deficiency anemia

Iron 2.0	umol/L	(9 - 30)
Ferritin 4.57	ug/L	(13 - 150)
Total Iron-Binding cap …89.3	umol/L	(44.8 - 80.6)

Diagnosis: Iron def. anaemia + Thalassaemia trait

	12. 41yo SF pre-op screening	13. 45 yo Indian male pre-employment	14. 52 yo Filipino male HTN	Normal
Anemia	**Microcytic**	**Microcytic**	**Microcytic**	
RBC	**3. 40**	**5.87**	**4.98**	4.7 -6.1x 10.e 12/L
Hb	**89**	**126**	**119**	130 – 180 g/L
MCV	**70.9**	**63.3**	**70.8**	80-94 fl
S. Iron	**2.6**	**13**	**34**	9-30µmol/L
Ferritin	**3.39** ↓	**266.7**	**691** ↑	30-400µg/L
Hemogl.**A2**	**2.1**	**5.4** HIGH	**2.2** NORMAL	2.0-3.5
Hemogl **F**	**0**	**<0.5**	**0**	0-2.0
Hemogl **A**	**97.9**	**>94**	**97.8**	95-99
Hemogl **S**	**0**	**0**	**0**	-
Hemogl **C**	**0**	**0**	**0**	-
	IDA	**B Th. Trait**	**Th. Trait, alpha**	

The Filipino guy took a lot of iron supplments → secondary hemosedrosis. Stop and educate and the level will go back to normal.

7. A 44 year old man, who is a known case of HCV positive.

- WBC……..2.0 L 4—11 x 10.e9/L
- RBC……..2.95 L 4.7—6.1 x 10.e12/L
- HB……..110 L 130—180 g/L
- HCT……..31.9 L 42—52 %
- MCV……..108.1 H 80 - 94 fl
- MCH……..37.3 H 27 - 32 pg
- RDW ……. 19.5 11.5 – 14.5 %
- PLT……..92 L 140 - 450 x 10.e9/L

Interpretation of the CBC:
- WBC is low.
- RBC, HGB are low
- PLT count is low
- MCV , MCH is high

- HEPATITIS C RNA QUALITATIVE …… Positive
- HEPATITIS C RNA QUANTITATIVE ……. 389744 IU/ML

Diagnosis: Pancytopenia 2nd to therapy Like interferon.

Normocytic Normochromic Anaemia

Anaemia of chronic diseases characterized by:

Serum Iron	Low
Ferritin	Normal or High
RDW	Normal or High

Causes:

- **Hypothyroidism**
- Chronic Diseases
- Malignancy
- Acute blood loss

1. A 70-year-old man, presents with 2 month H/0 easy fatigue and tiredness PMH: unremarkable The following CBC is shown below:

WBC	7.8		4 – 11 x10.e9/L
RBC	2.26	L	4.7 – 6.1 x10.e12/L
HGB	69	L	130 – 180 g/L
HCT	20.2	L	42 – 52 %
MCV	89.3		80 – 94 fl
MCH	30.6		27 – 32 pg
MCHC	343		320 – 360 g/L
RDW	15.8	H	11.5 – 14.5 %
PLT	179		140 – 450 x10.e9/L

What is your diagnosis?

Normocytic Normochromic Anaemia

DDx:

Hypothyroidism, Chronic Diseases, Malignancy

2. A 70-year-old man, known diabetic, admitted because of abdominal pain.
The following investigations are shown below:

#	Test	Result	Unit	Range
EDTA Whole Blood *- SAMPLE: 1*				
1	WBC	7.0	10.e9/L	4 - 11
2	RBC	3.38	10.e12/L	4.7 - 6.1
3	HGB	101	g/L	130 - 180
4	HCT	30.0	%	42 - 52
5	MCV	88.8	fl	80 - 94
6	MCH	29.9	pg	27 - 32
7	MCHC	336	g/L	320 - 360
8	RDW	17.8	%	11.5 - 14.5
9	HDW	0	g/L	-
10	PLT	246.0	10.e9/L	140 - 450

Low

#	Test	Result	Unit	Range
Serum *- SAMPLE: 1*				
1	Ferritin	1583.000	ug/L	30 - 400
2	Vitamin B12	630.600	PM/L	145 - 637

#	Test	Result	Unit	Range
Serum *- SAMPLE: 1*				
1	Iron	9.4	umol/L	11 - 31

Diagnosis:

Normocytic normochromic anaemia,
due to chronic disease, malignancy, hypothyroidism

Cont.

	Result	Unit		Range
1	Urea	21.0	H	mmol/L 2.9 - 7.5
2	Serum Creatinine	330	H	umol/L 62 - 115
3	Sodium	128	L	mmol/L 135 - 145
4	Potassium	4.2		mmol/L 3.5 - 5.1
7	Random Blood Sugar	8.6		mmol/L 3.9 - 9
10	Albumin	37		g/L 30 - 50
11	Corrected Calcium	2.4		mml/L 2.1 - 2.55
12	Inorganic Phosphorus	1.68	H	mmol/L 0.74 - 1.3
13	Total Bilirubin	58	H	umol/L 3 - 17
14	Direct Bilirubin	42	H	umol/L 0 - 5
15	Total Proteins	84	H	g/L 60 - 80
16	Alkaline Phosphatase	189	H	U/L 50 - 136
17	Alanine Aminotransferase	72	H	U/L 20 - 65
18	Aspartate Aminotransfer.	62	H	U/L 12 - 37
19	Gamma G T	142		U/L 15 - 85
21	Globulins	47.0		g/L 20 - 40
23	Creatine Kinase	6	L	U/L 39 - 308
24	Magnesium	0.8		mmol/L 0.7 - 1.1
25	Amylase	168	H	U/L 25 - 125
26	Lipase	1414.0	H	U/L 0 - 200

What is the diagnosis?

Chronic renal failure , because urea and creatinine are high.

“ Lipase is the most significant to diagnose acute pancreatitis ”

Macrocytic Anaemia

Anaemia of chronic diseases characterized by:

MCV	High
MCH	High

Causes:

- vitamin B12 deficiency
- Folic acid deficiency

1. A 57 year old man presents with 5 weeks H/O numbness and weakness of the lower limbs. He looked pale with signs of peripheral neuropathy.The following CBC is shown below:

WBC	**3.20**	L	4	–	11 x10.e9/L
RBC	**1.90**	L	4.7	–	6.1 x10.e12/L
HGB	**53**	L	130	–	180 g/L
HCT	15	L	42	–	52 %
MCV	**118**	H	80	–	94 fl
MCH	40	H	27	–	32 pg
MCHC	134	L	320	–	360 g/L
RDW	**24.6**	H	11.5	–	14.5 %
PLT	**39**	L	140	–	450 x10.e9/L

Blood film?

Hypersegmentation of neutrophils.

WHAT IS THE MOST LIKELY DIAGNOSIS?

Vitamin B12 Deficiency / Pernicious Anaemia

Mention three investigations necessary for this patient?

Vitamin B 12 level=> 67 PM/L (145 – 637)

Bone Marrow Aspiration

Gastroscopy

Cases with different diagnosis

1. A 63 year old woman presents with a 2 months' H/0 tiredness and easy bruising. 0/E cervical lymph nodes are felt and her spleen is palpable 4 cm below the costal margin The following investigations are shown below:

WBC	42.7		4 – 11 x10.e9/L
RBC	2. 6	L	4.7 – 6.1 x10.e12/L
HGB	83	L	130 – 180 g/L
HCT	30.2	L	42 – 52 %
MCV	102	H	80 – 94 fl
MCH	36.4	H	27 – 32 pg
PLT	52	L	140 – 450 x10.e9/L

- Differential

NEUT	8.5%	40 – 75 %
LYMP	89%	20 – 45 %
RETIC.....	5.3%	0.2 - 2 %

- Immunoglobulins

IGG.....3.5	8 - 18 g/L
IGM..... 0.1	0.6 - 2.5 g/L
IGA.....0.1	0.9 - 4.5 g/L

interpretation

Cont. Interpretations:

- High WBCs with mainly lymphocytes predominant
- Lymphadenopathy
- Splenomegally

Diagnosis: chronic lymphocytic leukaemia

Complications:

1. Autoimmune Haemolytic Anaemia based on: Low Hb and high reticulocytes.
2. Thrombocytopenia (bone marrow filteration).
3. Hypogammaglobulinaemia.

2. A 12-year-old boy presented with two days H/O of lethargy. His mother has noted him to be jaundiced. He was usually well. His PMH is unremarkable. O/E, he was pale and obviously jaundiced, no hepatomegally. The following investigations are shown below:

HB	**76**	**L**	130 – 180 g/L
WBC	6.90		4 – 11 x10.e9/L
PLT.....	413		140 - 450 xl0 .e9/L
Retic.	**5.4 %**	H	
Total bilirubin.....	94	H	(3- 17 umol/L)
Direct bilirubin			
Alanine aminotransferase ..	35		(20-65 u/L)
Urine urobilinogen :.....	+ve		

What is the most likely diagnosis?

G6PD deficiency

What additional details in history and further investigations? •

H/O exposure to Fava Beans / Drugs ✓

Screening test for G6PD, when haemolysis is not present. ✓

3. A 15 year old girl presents with 6 months H/O **hair fall**.

The following investigations are shown.

Hb ……	111	g/L	(120 – 160)
Ferritin …….	4.7	ng/ml	(13 – 150)
Vit D …….	11.2	nmol/L	(75 – 250)
TSH ……	3.2	mIU/L	(0.25 – 5)
Zinc ……	10.2	umol/L	(7.65 – 22.95)

What is your management?

Ferrous fumerate and folic acid to restore Ferritin level

Vitamin D3

4. A 62-year-old lady, known case of IHD presents with one week H/O black stools which is documented to be melena on PR. She was pale and abdomen is soft. Investigations revealed:

HGB 96	120 – 160 g/L
PLT 260	140 – 450 x10.e9/L

What is the most common cause could be responsible for this condition?

Aspirin

The most appropriate next step to do is:

A- Start her on ferrous sulphate

B- Start her on H2 blocker

C- Start her on proton pump inhibitor

D- Refer her for gastroscopy

Answer D

5. A 24 year old man presents with 2 days H/O loose motions, 3 – 5 times per day with blood and mucous. He gave H/O URTI and a course of antibiotic.

Stool analysis:

Mucous : ++

RBCs : 30 – 40 /HPF

WBCs : 10 – 20 /HPF

C/S: No growth

Management:

Discontinue Antibiotic

Oral fluids

Metronidazole

In severe cases, Vancomycin

Mention two differential diagnosis.

1. Acute dysentery e.g. Shigella / Amoebic
2. Pseudo Membranous Colitis

What is the most appropriate diagnosis based on the scenario?

Pseudo Membranous Colitis

Mention three drugs responsible for that picture.

1. Clindamycin 2. Ciprofloxacin 3. Amoxicillin

What is the causative agent?

Clostridium Difficile

6. A 42 year old lady presented with 2 days H/O lower abdominal pain and vomiting.

Result Unit Range URINE - SAMPLE: 1

NITRITE ..... POSITIVE
PH 8.5
PROTEIN ..... 1+
GLUCOSE ..... NIL
KETONE ..... TRACE
BLOOD ..... 3+
HEMOGLOBIN ..... 3+
WHITEBLOODCELLS ..... 467 cmm
REDBLOODCELLS 968cmm
CAST ..... NIL
CRYSTAL ..... NIL
OTHERS ..... BACTERIA ++
SPECIFICGRAVITY 1.025

What is your diagnosis?

Lower UTI, Cystitis

7. A 14 year-old boy presents with one month H/O puffiness of eye lids mainly by morning. The following urine analysis is shown below.

NITRITE: negative
PH: 5.8
PROTEIN: 4+
WBC: 10 / CMM
RBC: 10 / CMM
CASTS: NIL
ANTIBACTERIAL ACTIVITY: NIL
HEMOGLOBIN: NIL
CULTURE: NO GROWTH

INTERPRET THE RESULTS

Proteinuria and mostly Nephrotic syndrome

8.A 32 year old man who is a known case of IBS for the last 3 years,

Stool analysis shown below.

OCCULT BLOOD: NEGATIVE

OVA,CYST & PARASITE: NO OVA CYST or

PARASITE SEEN

CULTURE: SALMONELLA SEROGROUP C1

How are you going to manage this patient?

Self limiting and no need for antibiotic

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