CLL 101

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Chronic lymphocytic leukemia

Prolonged clinical course

“Chronic”

A particular type of blood cell – B lymphocyte

“Lymphocytic”

Cancer of white blood cells

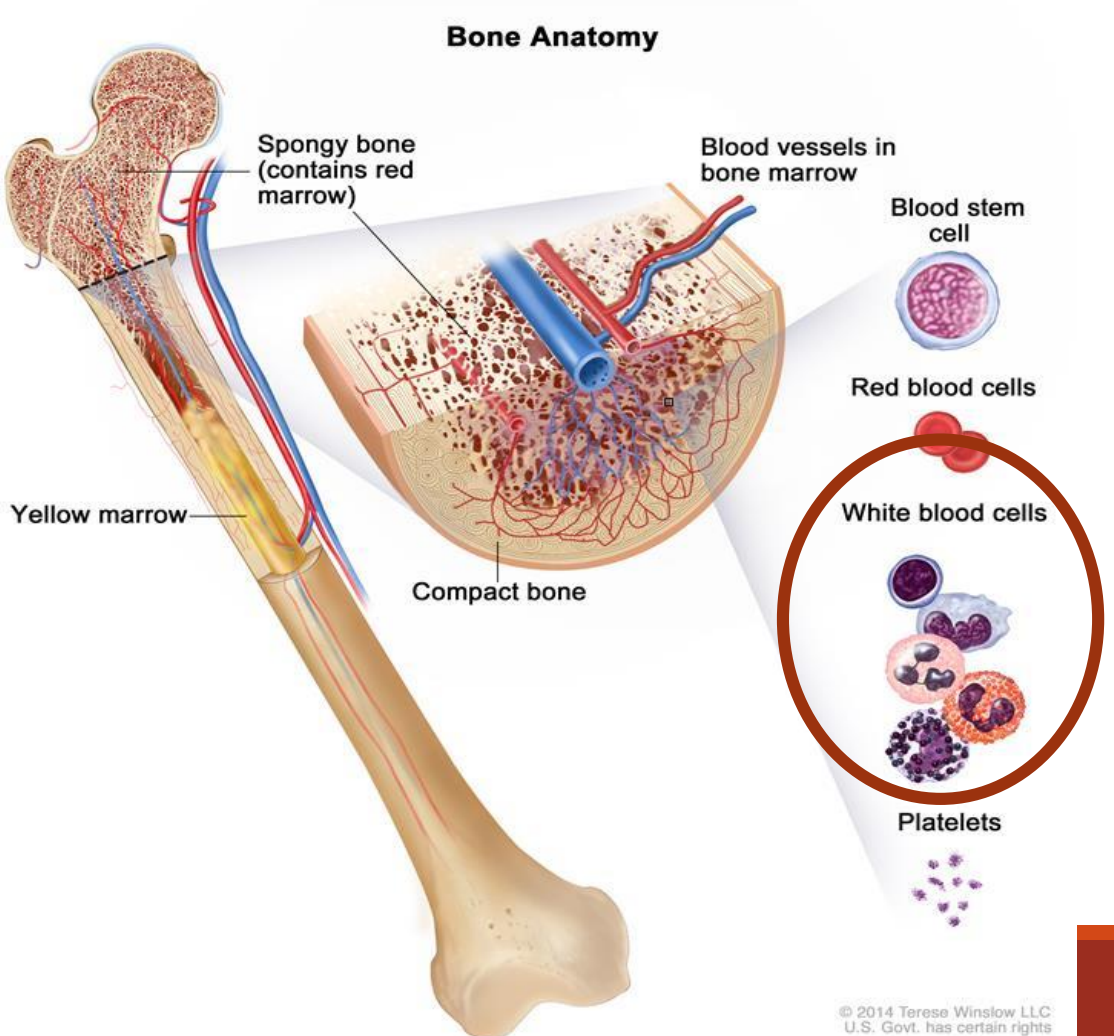
“Leukemia” – white blood

Chronic lymphocytic leukemia

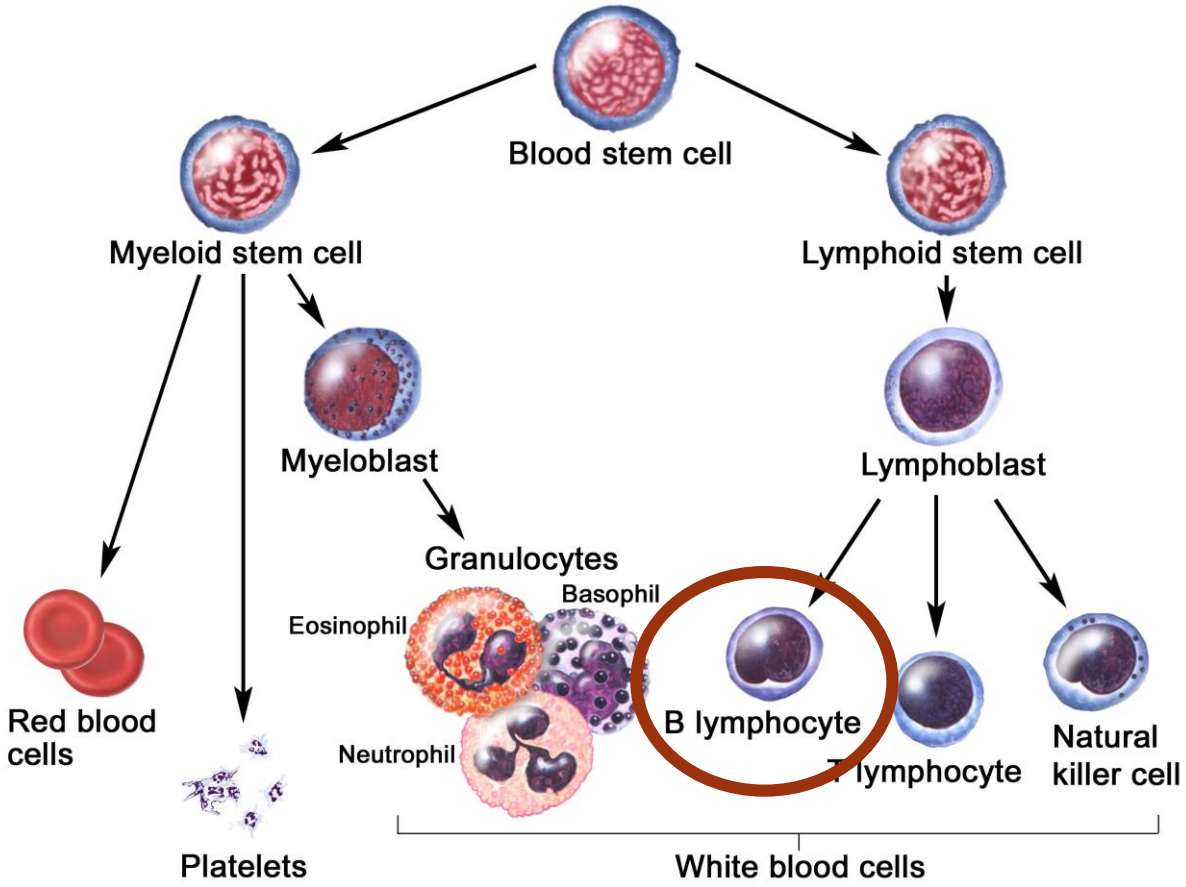
Small lymphocytic lymphoma (SLL) and **CLL** are **identical** under a microscope and are classified by the WHO as one disease

CLL is classified as a lymphoma because it acts and behaves like a lymphoma, even though it presents in the blood like a leukemia

Blood Cells Produced in Bone Marrow

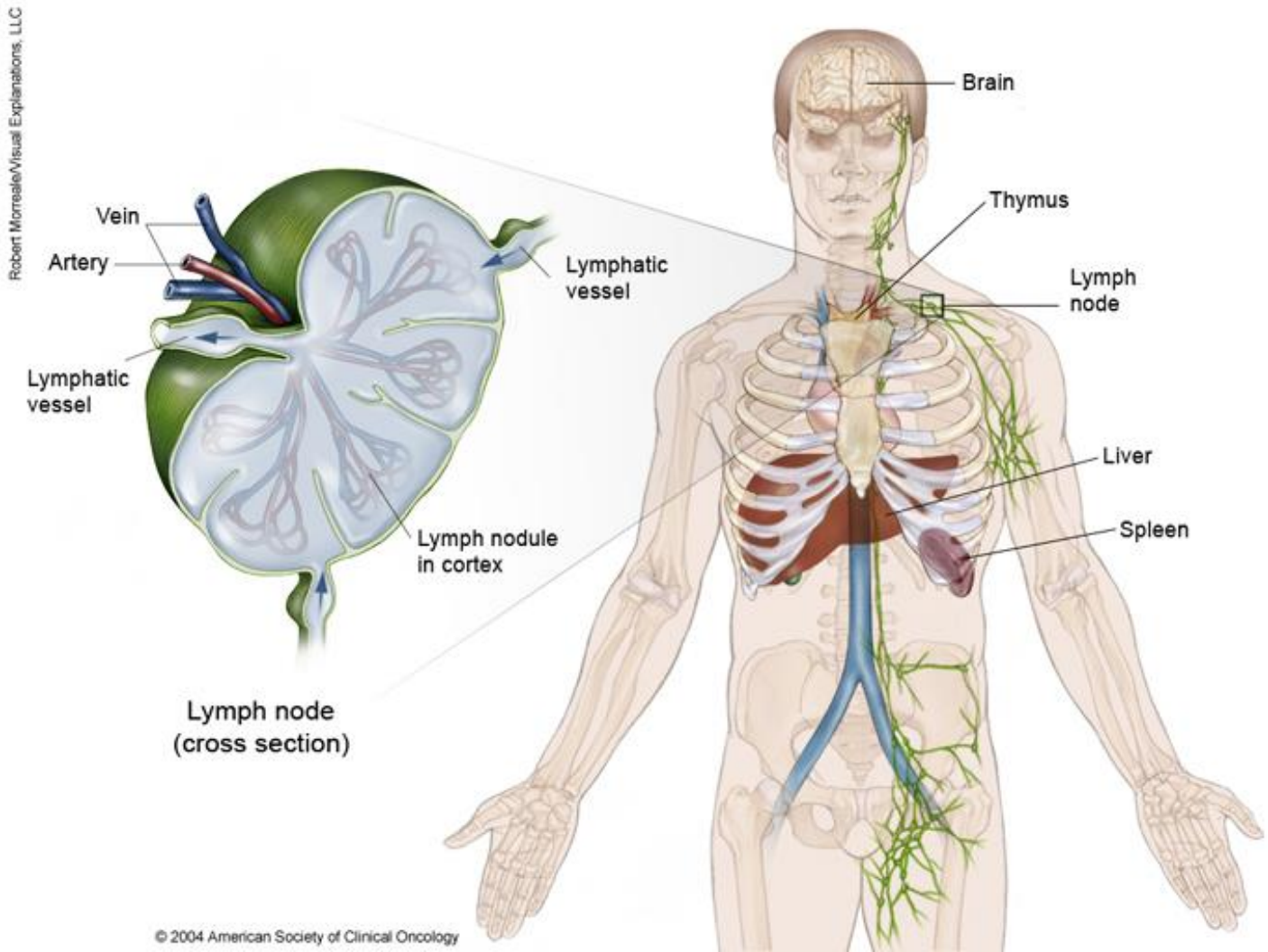


Cancer of White Blood Cells



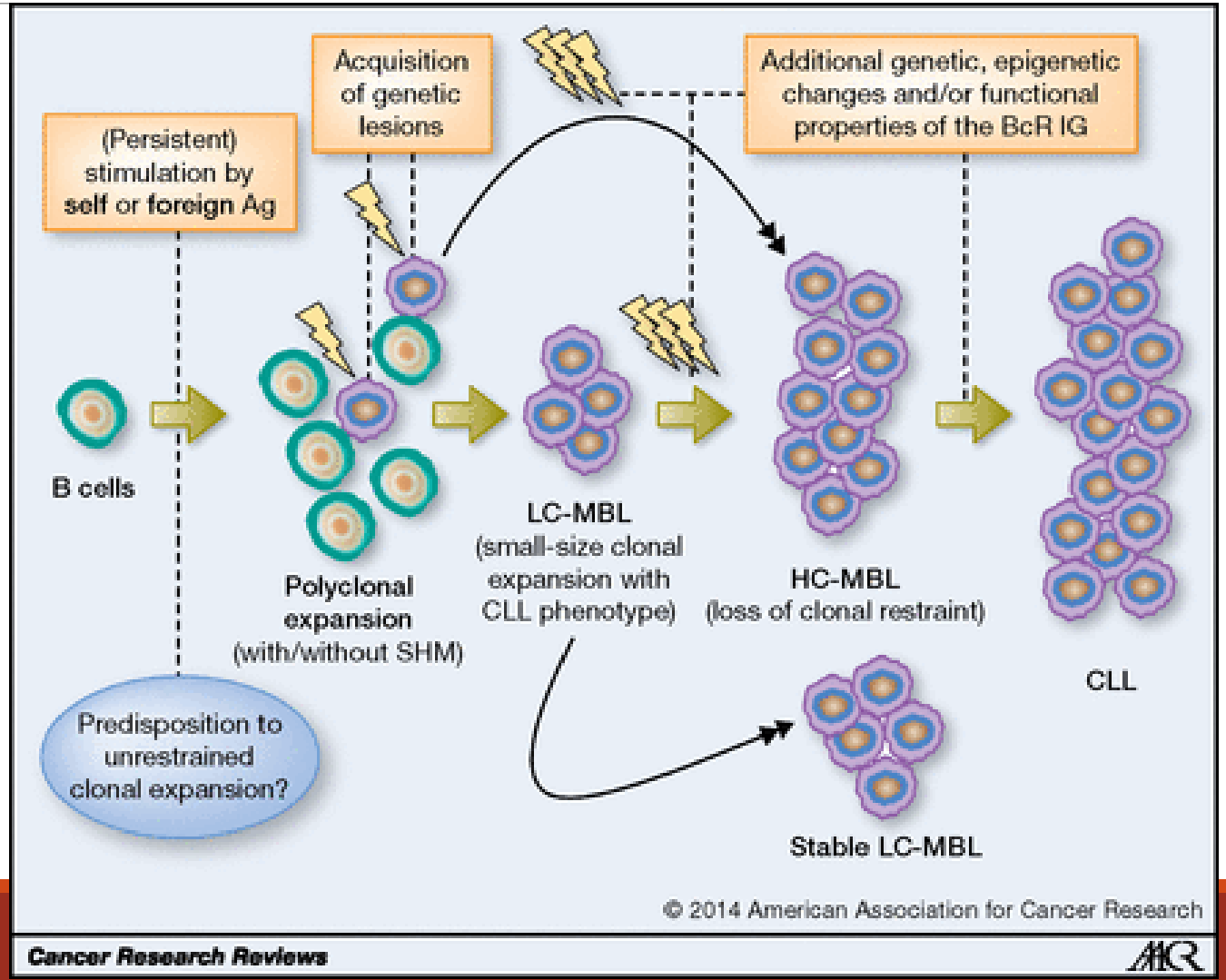
Lymphocytes

Lymphocytes circulate in the blood and in the lymphatic system and reside in organs and tissues

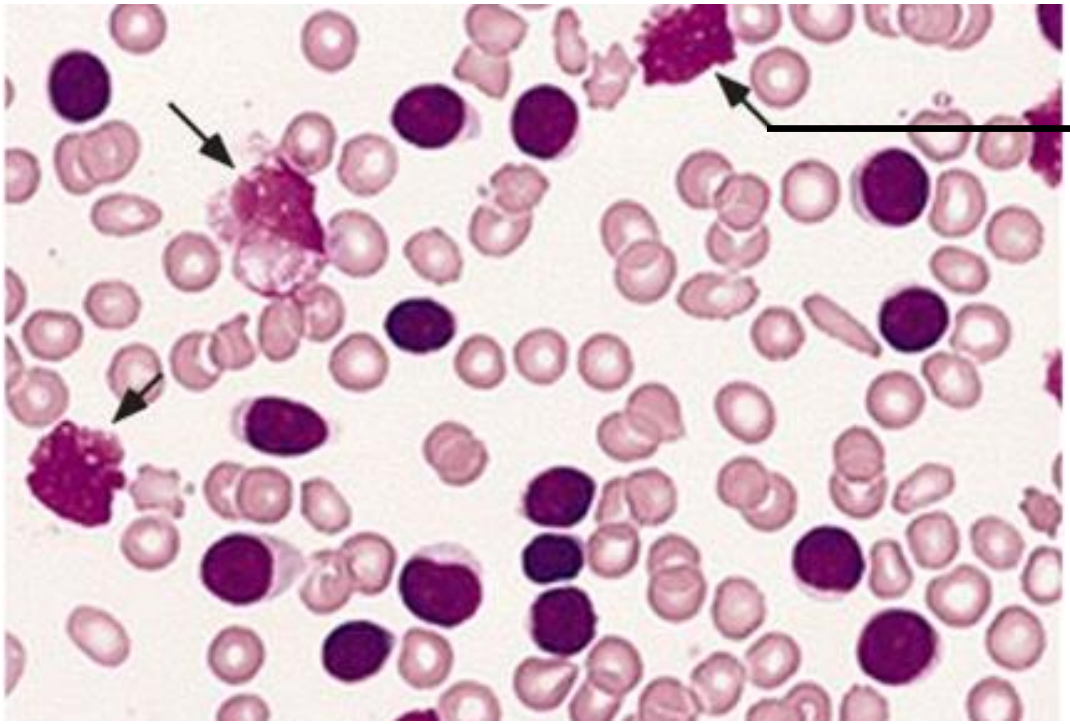


Clonal B-cells

A massive expansion of a single B-cell



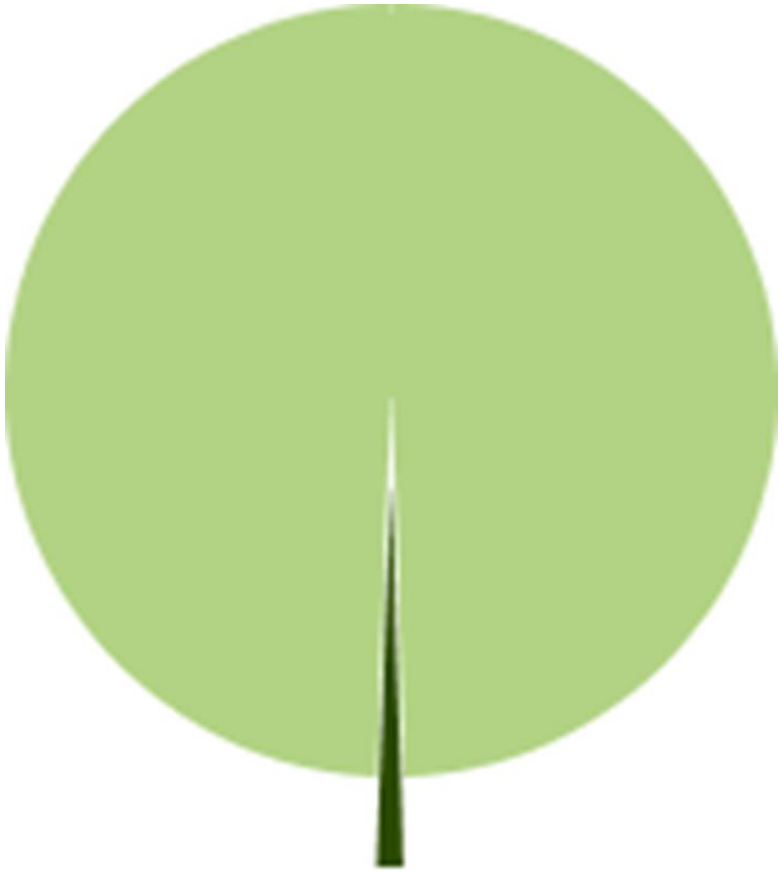
Clonal B-cells



Smudge cells (damaged lymphocytes)

Rare Disease

Worldwide incidence projected to be between < 1 and 5.5 per 100 000 people



Causes

We do not know what causes most cases of CLL

- Agent Orange or radiation?

There is no way to prevent CLL.

You can not catch CLL from someone else.

In some families, more than one blood relative has CLL

CLL Stats

- ✓Most common adult leukemia in the Western world
- ✓Average age of diagnosis is 72 but may be found in 20s
- ✓More common in men than women
- ✓Higher in Ashkenazi Jews. Lower in African, and especially Asian

Survival

2006-2012
82.6% of patients
surviving 5 years

B Lymphocytes Damaged by CLL Can…

Weaken the immune system

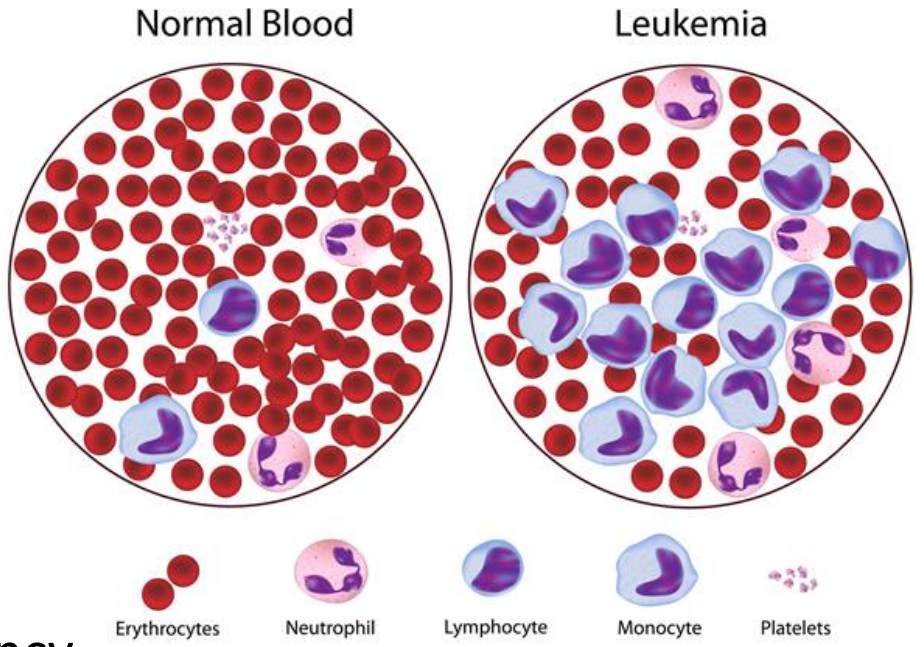
- No longer fight infections or diseases

Collect in large numbers

- Build up in the organs
- Cause lymph nodes to swell

Crowd out healthy blood cells (cytopenias)

- Low haemoglobin (anemia)
- Low platelets (thrombocytopenia) – bleeding tendency
- Low normal leukocytes (e.g. neutropenia) – inadequate defense



Symptoms

Symptoms from Low White Blood Cells

- Flu-like symptoms, such as fever, sweats, and body aches
- Infections from bacteria or viruses

Symptoms from Low Red Blood Cells

- Shortness of breath
- Fatigue, weakness, lack of energy, or sleepiness

Symptoms from Low Platelets

- Bleeding from the gums, red spots on the palate or ankles
- Easy bruising or prolonged bleeding from cuts
- Frequent or severe nosebleeds

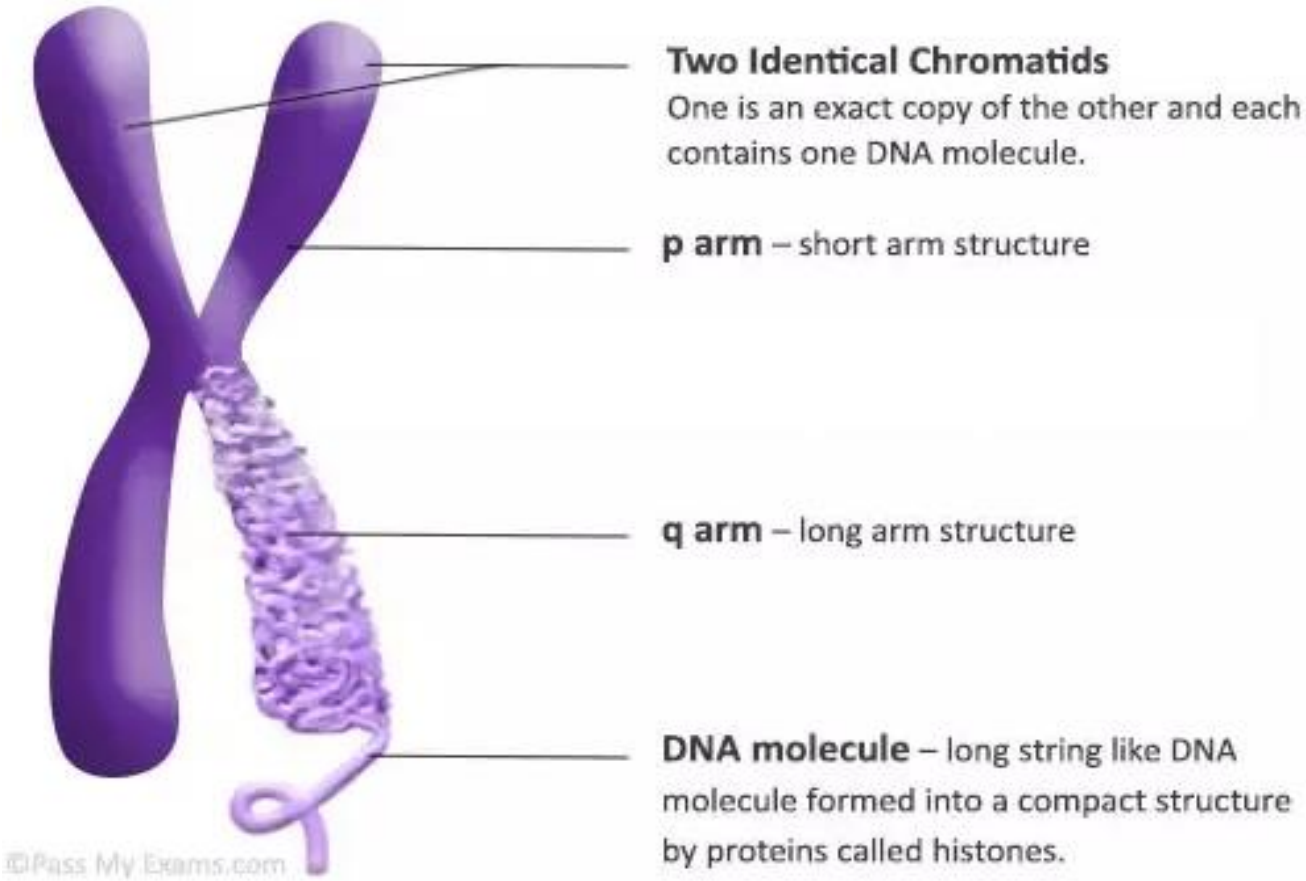
B Symptoms

- ✓loss of appetite
- ✓unexplained weight loss
- ✓night sweats
- ✓profound fatigue independent of anemia

Most patients have NO symptoms when diagnosed

Chromosomes

In humans, each cell normally contains **23 pairs of chromosomes**, for a **total of 46**. Twenty-two of these pairs, called autosomes, look the same in both males and females. The **23rd pair, the sex chromosomes**, differ between males and females



Chromosomal Abnormalities

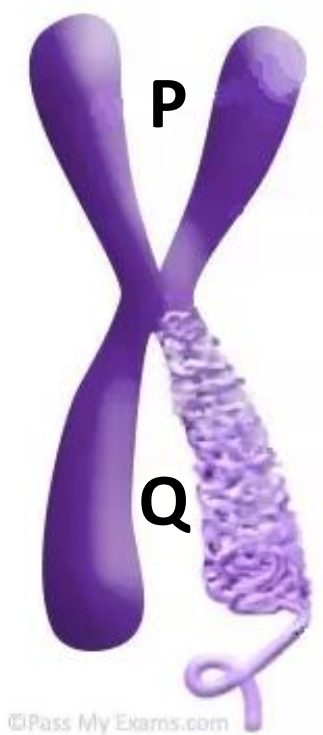
Approximately 80% of CLL patients have at least one chromosomal abnormality, an irregular, missing or extra part of DNA.

17p deletion

•on chromosome #17, a part of the short arm (p) is missing (deleted)

11q deletion

•on chromosome #11, a part of the long arm (q) is missing (deleted)



13q deletion

•on chromosome #13, a part of the long arm (q) is missing (deleted)

Trisomy 12

•An extra copy of chromosome 12

Mutations

Mutation = a DNA change

TP53 (tumour protein 53) has a role in tumour suppression, keeping cells from growing or dividing too fast or in an uncontrolled way.

IgVH (immunoglobulin heavy chain variable) helps control the immune response.

Other Markers

Beta-2 microglobulin (β2-Microglobulin or B2M) is a protein found on the surface of many cells. B-lymphocytes shed B2M into the blood. An increased number of B-lymphocytes means more B2M in the blood.

CD (cluster of differentiation): CD molecules are markers on the surface of cells that help identify and characterise white blood cells. Important to CLL are CD5, CD19, CD20, CD23.

Management

- Isn't it better to catch a cancer early?
- Not always
- There is no evidence that treating CLL just because it's there is of any value

Principles of CLL Therapy

- Prognostic and predictive testing should be done 1st to determine the best options
- Choices of available therapies vary greatly from one country to another
- New therapies are coming fast
- Clinical trials may be the best choice if possible
- All decisions should be shared between the Patient and the Doctor

CLL Confusion

- ? Clinical heterogeneity - long survival vs. aggressive clinical course
  - ➢ *likely reflecting the underlying biological heterogeneity*
- ? Prognostic testing helps but is not 100% predictive
- ? No curative treatment
- ? Diagnosis and treatment initiation do not coincide

Patient Concerns at Diagnosis

Patients have a hard time accepting a diagnosis of incurable cancer which does not have symptoms nor requires treatment.

After the initial shock of diagnosis, they are faced with a series of dilemmas, confusion and/or conflicting choices which lead to stress