



National
Cancer
Society
Malaysia

Giving Hope Celebrating Life



BRINGING EDUCATION AND UNDERSTANDING TO YOU



LEUKAEMIA

Bringing Education And Understanding To You

In collaboration with:



Supported by:



CONTENTS



01

What is leukaemia?

02

How common is leukaemia?

03

Who is at risk of leukaemia?

04

What are the signs and symptoms of leukaemia?

06

How do I find out if I have leukaemia?

07

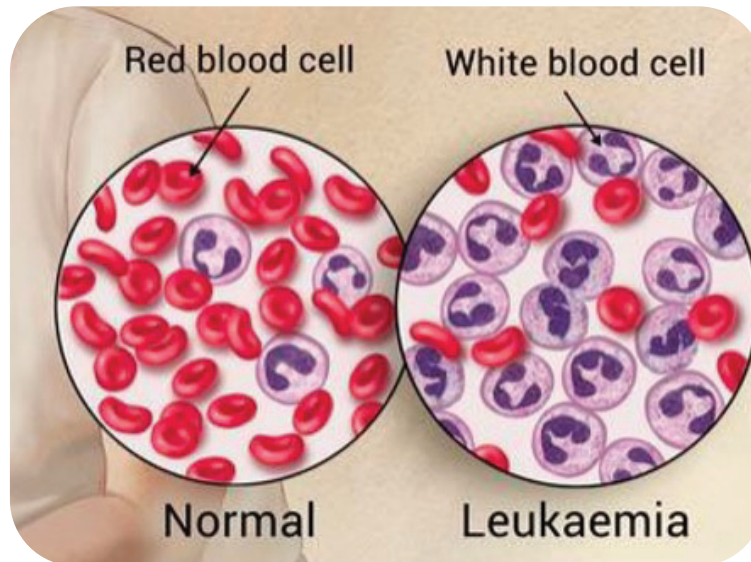
How do I protect myself from leukaemia?

08

How do I protect myself from cancer in general?

I What is leukaemia?

- **Leukaemia** is a type of blood cancer that occurs when **white blood cells** (one of the three main blood types- red, white, and platelets) in the body grow out of control and start changing in an abnormal way.¹



- Leukemia starts in the **bone marrow** and spreads into the **blood and to other organs**.¹
- They are grouped into **two types by**¹:

How quickly it develops:
acute or chronic; OR

The type of white blood cells
affected: lymphocytic or myeloid

- **Acute leukaemia** occurs when the body produces too many **immature blood cells**, which are abnormal and do not function properly.¹
- **Chronic leukaemia** occurs when the body produces too many **mature blood cells**, which do not function as well as normal blood cells do.¹
- A doctor will perform tests to find out the type of leukaemia that you have.

References:

1. Centers for Disease Control and Prevention. Questions and Answers about Leukemia. [Internet] 2012 Nov [cited on 2022 Nov 13]. Available from: <https://www.cdc.gov/nceh/radiation/phase2/mleukemi.pdf>

I How common is leukaemia?

Leukaemia is the number

6

most common cancer among Malaysians.²



- Each type of leukaemia affects people of different age groups.

Acute lymphoblastic leukaemia (ALL)

Affects mostly children below 5 years old, and is the most common childhood cancer.³

Acute myeloid leukaemia (AML)

Affects mostly people who are 45 years old or older.⁴

Chronic lymphocytic leukaemia (CLL)

Affects mostly adults above 50 years old.⁵

Chronic myeloid leukaemia (CML)

Affects mostly adults above 65 years old.⁶

References:

2. Azizah A, Hashimah B, Nirmal K, Siti Zubaidah A, Puteri N, Nabihah A et al. Malaysia National Cancer Registry Report (MNCR) 2012-2016. Putrajaya, Malaysia: Ministry of Health Malaysia; 2019.

3. American Cancer Society. Key Statistics for Acute Lymphoid Leukaemia. [Internet] 2022 Jan [cited on 2022 Nov 17]. Available from: <https://www.cancer.org/cancer/acute-lymphocytic-leukemia/about/key-statistics.html>

4. American Cancer Society. Key Statistics for Acute Myeloid Leukaemia. [Internet] 2022 Jan [cited on 2022 Nov 17]. Available from: <https://www.cancer.org/cancer/acute-myeloid-leukemia/about/key-statistics.html>

5. American Cancer Society. What Are The Risk Factors for Chronic Lymphocytic Leukaemia? [Internet] 2018 May [cited on 2022 Nov 17]. Available from: <https://www.cancer.org/cancer/chronic-lymphocytic-leukemia/causes-risks-prevention/risk-factors.html>

6. American Cancer Society. Key Statistics for Chronic Myeloid Leukaemia. [Internet] 2022 Jan [cited on 2022 Dec 30]. Available from: <https://www.cancer.org/cancer/chronic-myeloid-leukemia/about/statistics.html>

I Who is at risk of leukaemia?



- Such as polycythemia vera, essential thrombocythemia, and idiopathic myelofibrosis

- Benzene (used in the rubber industry, oil refineries, chemical plants, shoe manufacturing, motor vehicle exhaust, cigarette smoke, glue, detergent, art supplies and paints)

References:

7. American Cancer Society. Risk factors for Acute Myeloid Leukemia (AML). [Internet] 2022 Jan [cited on 2022 Nov 17]. Available from: <https://www.cancer.org/cancer/acute-myeloid-leukemia/causes-risks-prevention/risk-factors.html>

I What are the signs and symptoms of leukaemia?

- Right now, **no screening tests are available for leukaemia**. Therefore, it is very important to recognise the signs and symptoms.

Signs and symptoms of leukaemia⁸



Continuous and unexplained tiredness



Fever



Getting sick often and for longer periods of time



Easy bruising or bleeding tendency (blood in stool, red or purple spots or skin rashes)

The difference between signs and symptoms:

Signs are what others see (e.g. swelling and bleeding),
symptoms are what you feel (e.g. headache and pain).⁹

TALK TO YOUR DOCTOR IF YOU NOTICE ANY OF THESE CHANGES

References:

8. Blood cancer UK. Leukaemia symptoms and signs. [Internet] 2022 Jan [cited on 2022 Nov 17]. Available from: <https://bloodcancer.org.uk/understanding-blood-cancer/leukaemia/leukaemia-symptoms-signs/>

9. American Cancer Society. Signs and symptoms of cancer [Internet]. 2020 Nov 6 [cited on 2022 Dec 28]. Available from: <https://www.cancer.org/treatment/understanding-your-diagnosis/signs-and-symptoms-of-cancer.html>

I What are the signs and symptoms of leukaemia? (continued)

Signs and symptoms of leukaemia⁸



Unexplained weight loss



Shortness of breath



Feeling generally unwell



Lump(s) in the neck, armpit, or groin area

The difference between signs and symptoms:

Signs are what others see (e.g. swelling and bleeding),
symptoms are what you feel (e.g. headache and pain).⁹

TALK TO YOUR DOCTOR IF YOU NOTICE ANY OF THESE CHANGES

I How do I find out if I have leukaemia?

- First, visit a doctor, who will perform the following procedures¹⁰:



1. Doctor consultation

- The doctor will ask questions and perform routine examinations.



2. Blood test and biopsy

- The doctor will take your blood using a needle and a syringe to look for abnormalities in your blood cells.
- If the results are abnormal, the doctor will proceed with a bone marrow biopsy.
- **Biopsy:** the doctor will insert a needle into your hip bone to take some blood from the bone marrow and check it for abnormal blood cells.
- With this procedure, the doctor can confirm the diagnosis of leukaemia.

BASED ON THE RESULTS, THE DOCTOR WILL ADVISE ON THE NEXT STEPS

References:

10. American Cancer Society. Can Acute Myeloid Leukaemia (AML) Be Prevented? [Internet] 2022 Jan [cited on 2022 Nov 17]. Available from: <https://www.cancer.org/cancer/acute-myeloid-leukemia/causes-risks-prevention/prevention.html>

I How do I protect myself from leukaemia?

- Unfortunately, leukaemia cannot be prevented in children.
- However, for adults, certain actions can reduce your risk of leukaemia^{10,11}:



Don't smoke

Avoid active and passive smoking completely. Cigarettes contain benzene, known to cause leukaemia.



Avoid exposure to benzene

Minimise benzene exposure by staying away from vehicle exhaust, art supplies, and glue. Clean yourself and your clothes after any exposure.



Be careful when pumping gasoline

Avoid skin contact with gasoline.
Avoid spending too much time near car engines that are left on and inhaling fumes from gasoline and vehicle exhaust.



Wear personal protective equipment (PPE) at work

If your work exposes you to benzene, make sure you wear your PPE.

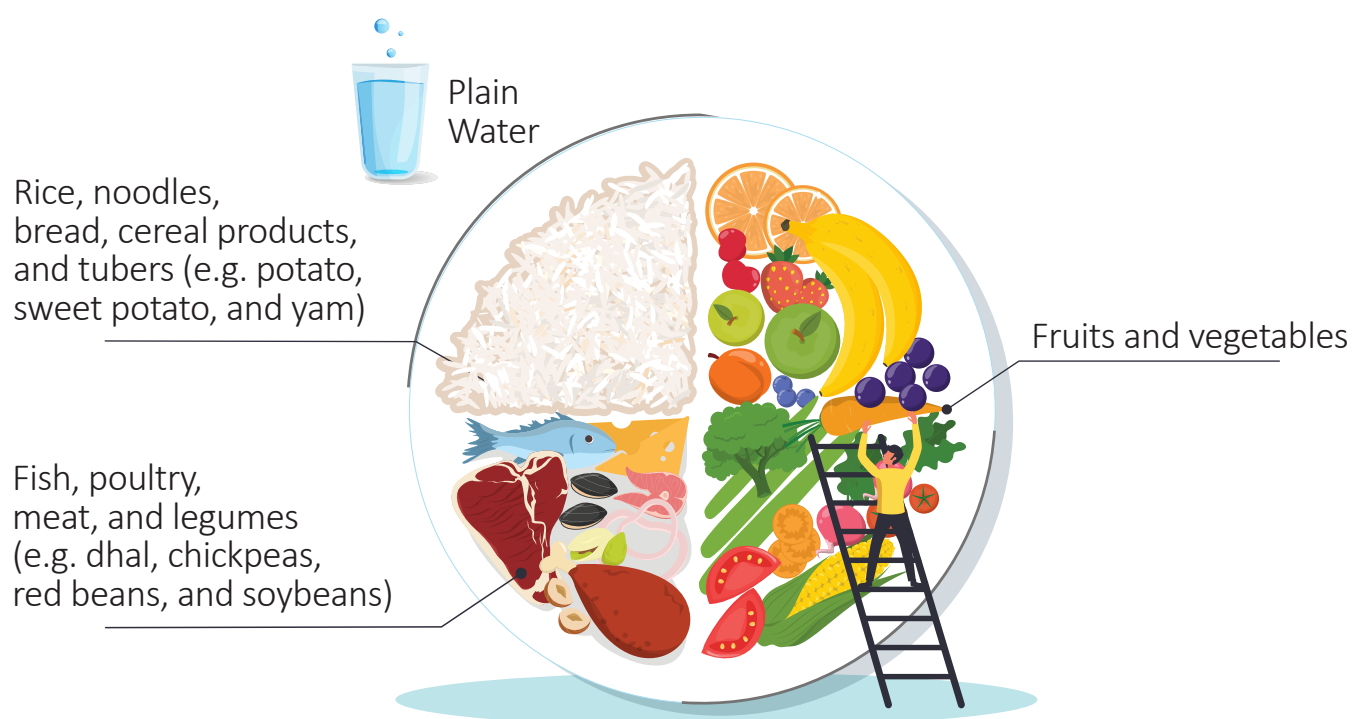
References:

11. American Cancer Society. Benzene and cancer risk. [Internet] 2022 Jan [cited on 2022 Nov 17]. Available from: <https://www.cancer.org/healthy/cancer-causes/chemicals/benzene.html>

I How do I protect myself from cancer in general?

Eat Healthy

The diagram below shows the **Malaysian Healthy Plate with Quarter Quarter Half concept**.
Use this as a visual guide to healthy, balanced meals.¹²



Recommendation for the following food products:

	Red meat	Less than 500g/week = 3 palm sizes of meat in total ¹³		2 servings of fruits and 3 servings of vegetables daily¹³	E.g., eat 1 apple + 1 slice watermelon + 12 tablespoons of cooked leafy vegetables/day
	Processed meat	Avoid completely ¹³		Sugar sweetened drinks	Avoid completely ¹³
	More than 2 servings of wholegrain daily¹³	E.g., eat at least 2 slices brown bread + 0.5 cup cooked brown rice/day		Processed foods	Less than once a week or avoid completely ¹³

References:

12. Panduan Pinggan Sihat Malaysia. Putrajaya (MY). Ministry of Health Malaysia; 2016. 50 p. Report No.: 1.

13. World Cancer Research Fund/American Institute for Cancer Research. "Continuous Update Project Expert Report 2018.

Recommendations and public health and policy implications." [Internet]. [cited on 2022 Nov 17]. Available from: dietandcancerreport.org

| How do I protect myself from cancer in general? (continued)

Be Active

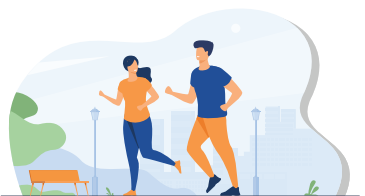


150 Minutes

Moderate-intensity* aerobic activity per week¹⁴

Brisk walking, jogging, swimming, tennis (doubles), cycling, hiking, line dancing

or



75 Minutes

Vigorous-intensity** aerobic activity per week¹⁴

Running, swimming laps, tennis (singles), jumping rope, aerobic dance, kickboxing

and



At least 2 days

of muscle strengthening activities per week¹⁴

Use of exercise bands, weight machines, or hand-held weights; push-ups, pull-ups, planks, squats, lunges, some yoga postures and tai chi

How do you measure intensity?

Use the 'talk test'

*Moderate-intensity exercise	Moderate effort required. You breathe harder, you start to sweat, and you will talk more slowly than you do normally. ¹⁵
**Vigorous-intensity exercise	High effort required. You are puffing, sweating, and can only talk with pauses. ¹⁵

References:

14. World Health Organization. Physical Activity [Internet]. [cited on 2022 Nov 17]. Available from: <https://www.who.int/news-room/fact-sheets/detail/physical-activity>

15. Cancer Council Australia. "Exercise for people living with cancer" [Internet]. 2019. [cited on 2022 Nov 17]. Available from: <https://www.cancer.org.au/assets/pdf/exercise-for-people-living-with-cancer>

Authors

Dr Alagu Manthiram A/L Ramasamy,

MD (CSMU) Doctor (KKM)

Dr Alessio Panza,

MD (UNIPV), MCommH (UOL), DTMH

Dr Caryn Chan Mei Hsein,

PhD in Psychosocial Oncology (UM) B.S(Psych)

Chan Wan Thung,

BSc (Hons) Nutrition & Dietetics (IMU)

Dr Chin Yu Aun,

MBBS (SEGI)

Dr Dalilah Kamaruddin,

MBBS (King Edward Medical College, Lahore, Pakistan), MBA (Uni of West Scotland)

Prof Elil Renganathan,

MD (Uni of Bonn, Germany) PhD, MSc from University of London

Dr Feisul Idzwan Bin Mustapha,

MBBS (UNEW) upon Tyne (UK) MPH (Epidemiology & Biostatistics) (UKM)

Assoc Prof Dr Foong Chan Choong,

BScEd (UM), PhD (UM), FAIMER Fellow,

Dr Han Albert Dicken,

MBBS (MAHE)

Dr Hong Wei-Han,

BSc Chemistry (UTM), MEd (UM), PhD (Medical Education, UM)

Dr Isabelle Soerjomataram,

MD, PhD in Cancer Epidemiology (EUR)

Dr Janice Hew Pei Fang,

DDS (UKM)

Dr Jessica Canute,

MD(USM)

Dr Kavinash Loganathan,

BSc (Hons) (Medical Bioscience, Monash University), PhD (Neuroscience, Monash University)

Dr Mah Wen Yi,

MB BCh BAO (NUI, RCSEd) LRCP & SI

Mahirah Binti Ma'som,

BSc (Hons) Biomedical Science (UniShef)

Marie Ishida,

MPH (UniMelb)

Mandy Thoo,

Biotech (ANU), PgCert Global Tobacco Control (JHSPH), MScComm (ANU)

Dr Meyharshnee Gunaseelan,

MB, BCh BAO (NUI, RCSEd) LRCP & SI

Mohamad Ishak Ahmad Abir,

BSc in Public Health (SHSU)

Prof Dr Mohammad Nasir Bin Bistamam,

PhD in Psychology (Counselling) M.Ed. (Counselling) B.Ed.

Nariza Alysa Azryn,

BBIomed (UniMelb)

Prof Dr Nirmala A/P Bhoo Pathy,

PhD in Breast Cancer Risk Factors and Outcome (Netherlands) MSc Clinical Epidemiology-Hons

Dr Noraryana Binti Hassan,

MBBS (Malaya), MPH Health Promotion (UNIMAS)

Dr Norie Kawahara,

PhD (Medical Science, JuntendoU), Cross-boundary Cancer Studies (UTokyo)

Dr Ruthresh Rao Subramanyan,

MBBS (UnizSA)

Assoc Prof Dr Samsiah Binti Mohd Jais,

PhD in Counselling from University of South Australia M. Psych (UKM) B.A(Psych) (UMKC,US)

Prof Dr Sanjay Rampal A/L Lekhraj Rampal,

PhD in Epidemiology from Johns Hopkins University

Dr Sathirakorn Pongpanich,

PhD in Health Economics and Health Policy and Management (JHU), UCLA & Harvard

Shigeru Matsui,

Bachelor of Engineering (Toyama Prefectural U)MSciComm (ANU)

Tepei Sakano,

Allm CEO/FOUNDER, DeNA Medical Business Unit Head, Japan Medical Venture Association Director, Tohoku University Appointed Professor, Tokyo Medical and Dental University

Thaarenee Wiswannadan,

BSc Nutrition (AU), MSc Public Health Nutrition (UKM)

Dr Tomoko Matsushita,

PhD (Urban Engineering, UTokyo), Registered Architect (Japan)

Prof Dr Victor Hoe Chee Wai Bin Abdullah,

PhD in Occupational Health and Safety from Monash University MPH MPH (Occupational Health) ME (Safety, Health and Environment) MOSH from the University of Turin and the International Labour Organization

Dr Vignesvari Subramaniam,

MBBS (MAHSA), GCFM

Dr Vijayan Munusamy,

MD, mMED (UM): Pg Diploma and Master in Respiratory Medicine (South Wales, UK)

Dr Wong Ping Foo,

MBBS (IMU), DR FAM MED (UKM), FRACGP (AUS), MAFP (MAL), AM (MAL)

Zen-U Hotta,

ABD (Engineering, UTokyo), Certified Advanced Social Researcher (IASR, Japan)

Dato' Dr Saunthari Somasundaram,

DPMP MBCh, BAO, LRCP, LRCS (Ireland) MBA (UK)

Assoc Prof Dr Murallitharan Munisamy,

MD(UA) MCommHealth(UKM) Dip.Derm(Thailand) PGDipCR(India) MSc(London) MMedEd (Malaya) FRSPH (UK) PhD (Public Health)

