

Lymphoma (continued)

TYPES OF LYMPHOMA

Hodgkin lymphoma - most commonly affecting younger persons - has a high cure rate, about 80%. In this lymphoma the abnormal lymphocyte is the Reed-Sternberg cell.

Non-Hodgkin's lymphoma (NHL) - most commonly affecting older persons

NHL is much more common than Hodgkin. The most common aggressive NHL is diffuse large b-cell lymphoma. The second most common NHL is indolent follicular lymphoma.

Lymphoma can arise from b- or t-lymphocytes.

B-cell lymphomas are the most common: 85%; Subtypes include: Diffuse large B-cell, Follicular, Mantle cell, Lymphoplasmacytic, Burkitt's lymphoma, Primary mediastinal large B-cell, Extranodal marginal zone B-cell, Nodal marginal zone B-cell, CLL, CNS- and HIV-associated lymphomas

T-cell lymphomas are uncommon: 15%. Subtypes include: Peripheral, Angioimmunoblastic, Anaplastic large cell, Hepatosplenic, Subcutaneous panniculitis-like, Enteropathy type, Extranodal, Natural Killer, Nasal type, Skin - including Mycosis fungoides/Sézary syndrome

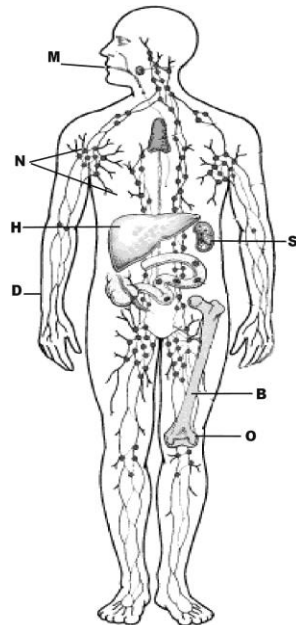
TREATMENTS

The treatment depends on the **type** and **stage** of the disease - and increasingly by risk factors identified in the cells.

The approach also depends on the **grade** - such as to observe and treat as needed with lower toxic therapy if the disease is **indolent** (slow growing), or to treat immediately and more aggressively with curative intent when it is an **aggressive** type.

The stage of lymphoma at diagnosis is often widespread and bone marrow involvement is common. Unlike so-called solid cancers, lymphoma can be treated effectively (cured or managed well) even at an advanced stage.

Lymphoma is usually sensitive to standard chemo- and radio-therapies. Targeted, biologic and immune therapies can also be effective. Treatment is typically systemic (infused into the blood), unless it is diagnosed early when it can be treated locally with radiotherapy with curative intent.



Lymphoma can present anywhere normal lymphocytes -- blood cells that provide immune defense -- are found.

- N lymph nodes
- H liver (hepatic)
- L lung (not shown)
- B bone marrow
- S spleen
- P pleura (lung lining - not shown)
- O bone
- D skin
- M mucosal linings - nose, stomach, eyes, etc.

Lymphoma is not one cancer, but a name for a group of related cancers that arise when a Lymphocyte (an immune cell) becomes malignant.

When a lymphocyte becomes malignant its biologic behavior is arrested at its stage of development.

Lymphomas cells may grow too fast or fail to die, and accumulate to form tumors in the body, most commonly in the lymphatic system -- the network of lymph nodes and channels that transports a watery clear fluid called lymph.

LYMPHOMA AWARENESS MONTH

September



Patients Against Lymphoma

Providing evidence-based support and information ...

Advancing the routine and informed consideration of clinical trials

Patients Against Lymphoma

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PAL is a 501 (c) (3) non-profit organization

How to Help!

Independent of health industry funding, PAL depends ENTIRELY on public support.
www.lymphomation.org/how-to-help.htm

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WHAT IS LYMPHOMA

Lymphoma is a type of blood cell cancer affecting lymphocytes (or white blood cells) that normally protect us from infection and disease.

The abnormal lymphocytes -- having survival and growth advantages over normal blood cells -- can accumulate to form **tumors**, often in the lymph nodes, but also in the bone marrow and other parts of the body.

WHAT IS CANCER

Under normal conditions there is a balance in which new cells replace old or defective cells. Cancer cells have defects; most commonly in the genetic code or gene expression involved in cell growth and repair ... allowing for abnormal cell *growth and survival*.

The hallmarks of cancer cells include:

- Clonal population with a limitless potential to divide and grow
- Resisting apoptosis - normal programmed cell death - leading to the accumulation of the cells.
- Inhibition of immunity against the abnormal features of the tumor cells
- Development of a sustaining blood supply (angiogenesis)
- Self sufficiency in growth signals
- Insensitive to anti-growth signals
- Metastasis (spreading beyond the organ of origin)

RISK FACTORS

Lymphomas arise from accumulated mutation to the cells over many years. The known risk factors include:

- Aging
- Immune suppression
- Persistent inflammation / chronic infection
- Environmental carcinogens – Atrazine, nitrates, fertilizers, PCBs and other chemicals are suspected

SYMPTOMS & SIGNS

The symptoms and signs vary by type and locations of the tumors:

- Painless and persistent (1-2 months) lump(s) in the neck, armpit or groin
- Drenching (change the sheets) night sweats
- Unexplained persistent fever
- Unexplained weight loss
- Red skin patches
- Chronic fatigue
- Low blood cell counts

These can be unrelated to lymphoma. Only a biopsy of tissue can diagnose a lymphoma and the type.

ANYONE WE KNOW?

Reflecting the high prevalence of lymphoma: Dick Gregory, King Hussein of Jordan, Charles A. Lindbergh, Roger Maris, Jackie Kennedy Onassis, Joey Ramone, Senator Fred Thompson, Paul E. Tsongas, Gene Wilder ...

HOW COMMON

Our **lifetime risk** is about **1 in 50**.

Lymphoma is **more common than leukemia**. SEER provides age-adjusted incidence rates as follows:

Leukemias:

~ **12** per 100,000 per year

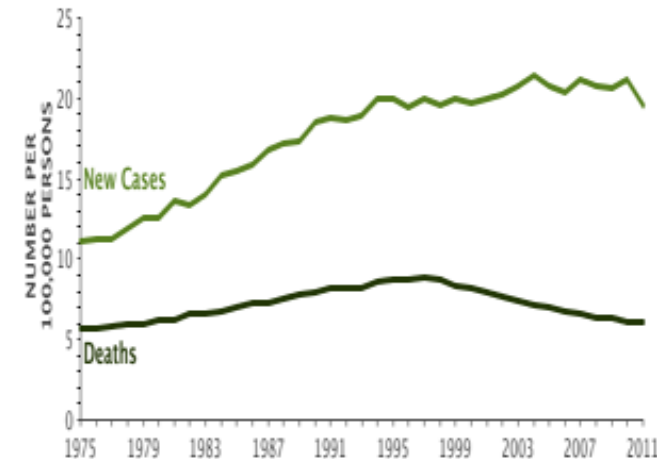
Lymphomas:

~ **20** per 100,000 per year

~ **6%** of childhood cancers

TRENDS: Incidence increased ~4% *annually* in the US ... leveling off/declining recently.

Advances in treatment due to clinical research have reduced the mortality rate as shown:



NHL Incidence & U.S. Mortality
1975–2011
All Races, Both Sexes
Rates are Age-Adjusted (SEER)