



Leukemia Jewelers

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Acute Lymphoblastic Leukemia

Other types of leukemia in pediatrics

- AML
- Chronic leukemia: CML, JMML
- Chronic Lymphocytic leukemia (CLL) is not present in Pediatrics

History of Leukemia

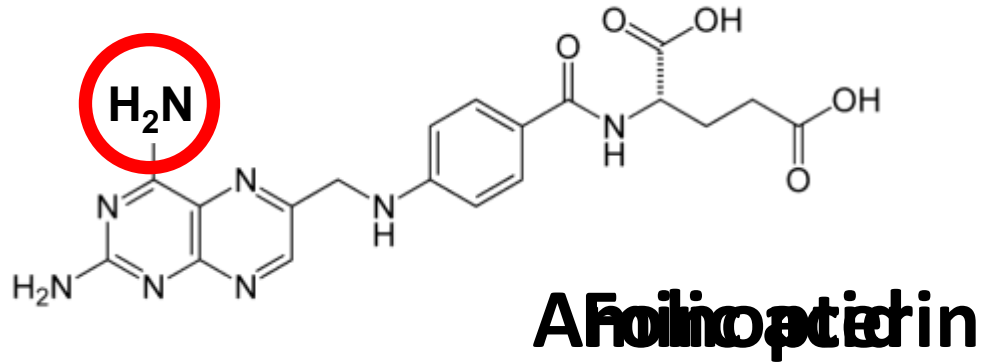
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1845

The disease was
clearly described
by *Dr. John
Hughes Bennett*

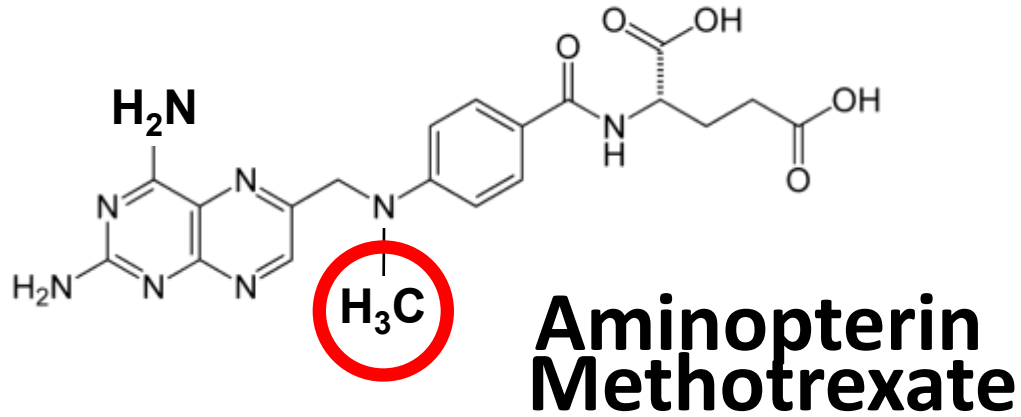
History of Leukemia



1946

**Antifolate agents
(Aminopterin) was
used to treat
leukemia.**

History of Leukemia



1946

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History of Leukemia

- **Steroids kills cancer cells since it is a lympholytic agent.**
- **Induce remission in 30% of patients (for a short period).**
- **Do not use steroids alone in suspicious cases of leukemia.**

1949

The therapeutic value of the adrenal corticosteroids was founded

History of Leukemia



1960s

**other antileukemic
drugs were
introduced
(Vincristine in
1962)**

History of Leukemia



1960s

POMP regimen
was developed
Prednisolone
Vincristine
Methotrexate
6-MP

History of Leukemia

- **L-Asparaginase is the 1st specific agent for the cancer cell since it depletes the amino acid asparagine which is essential A.A. for the cancer cell and non-essential to normal cell.**



1970

**other antileukemic
drugs were
introduced
(L-Asparaginase in
1970)**

History of Leukemia

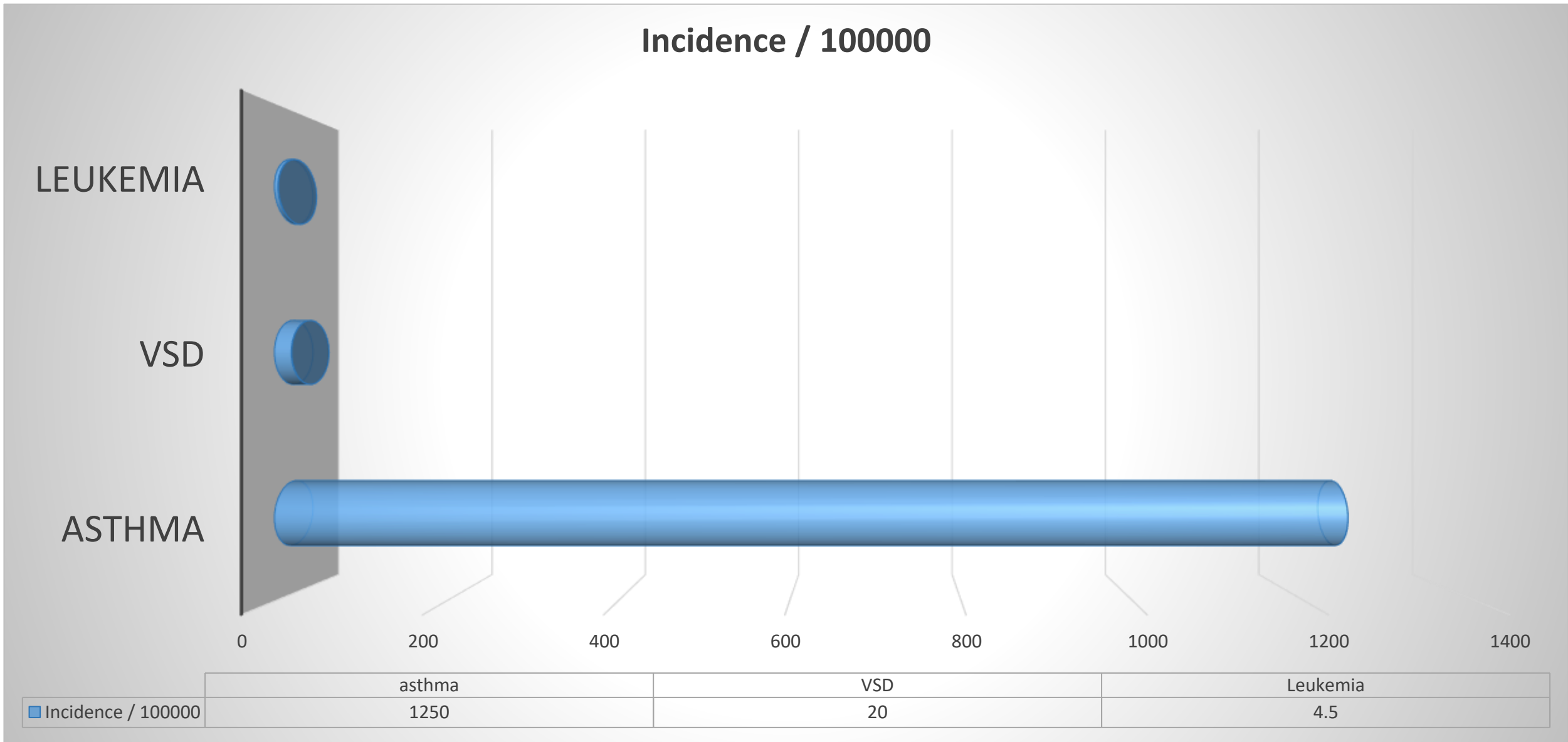
- Monoclonal antibodies had not been widely used in the treatment of ALL except Blinatumomab (**Blinicyto**) which is bispecific T-cell engager.
- Used after 2022 for cases of relapsed ALL.



1968

**Clinicians at St.
Jude Children's
Research Hospital
began to use CNS
prophylaxis**

Incidence of Leukemia



WHAT IS BEHIND MALIGNANCY?





MALIGNANCY

ENVIRONMENT

Clinical Presentation

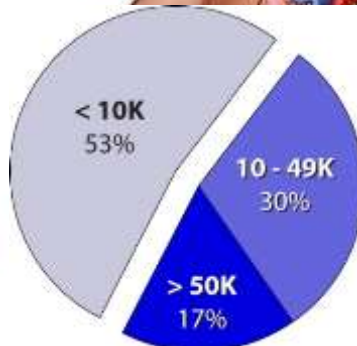
WBCs

Fever (61%)

Bacterial infections

Fungal infections

Viral infections



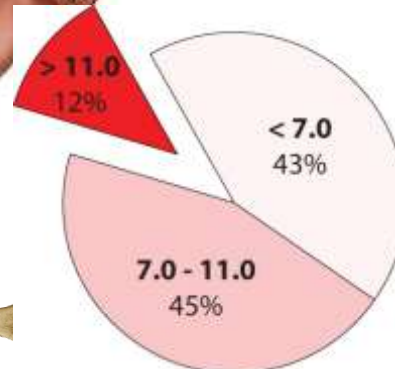
RBCs (Hgb)

Lethargy

Malaise

Pallor

Syncope



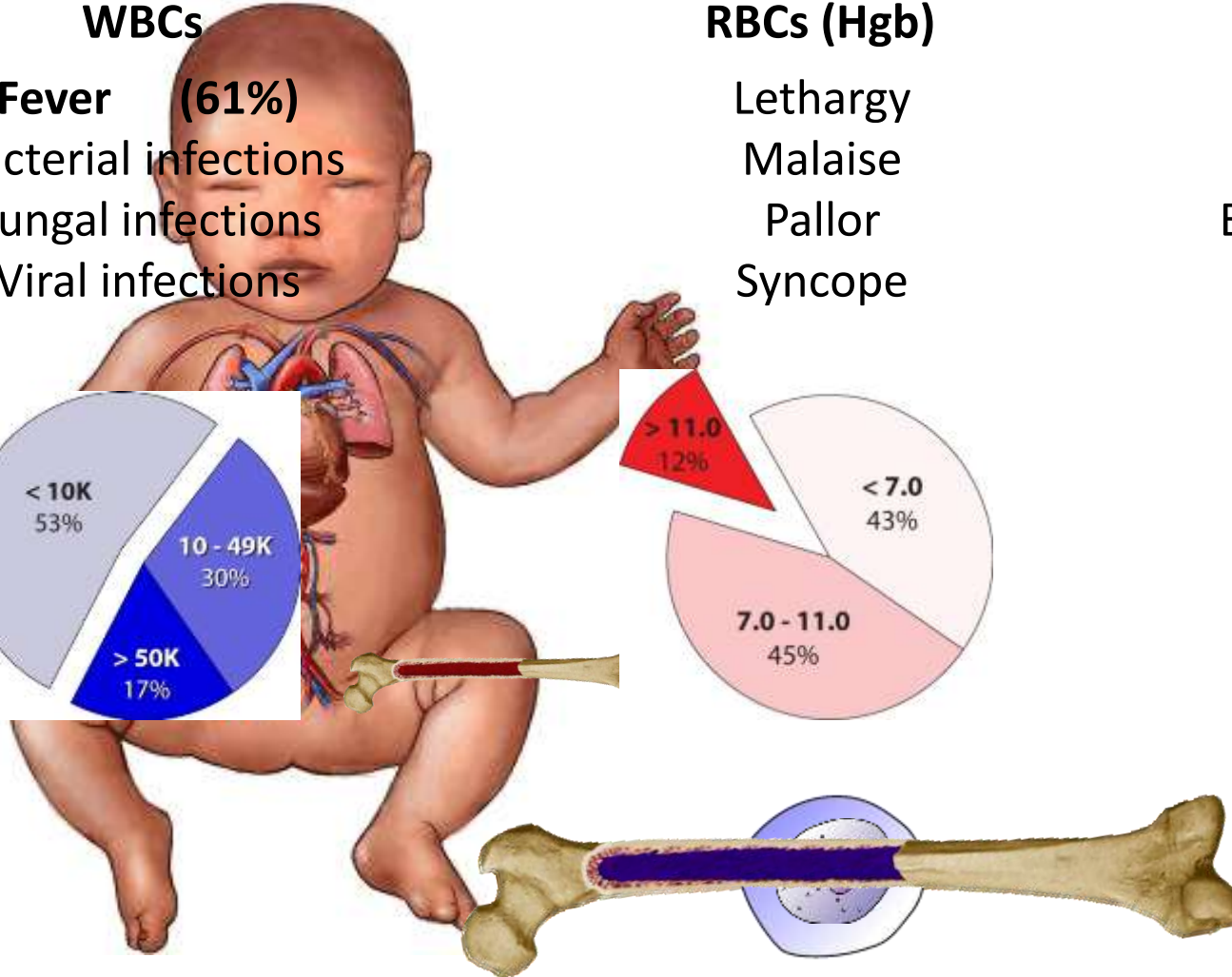
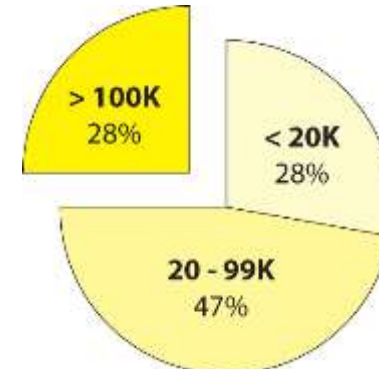
Platelets

Bleeding (48%)

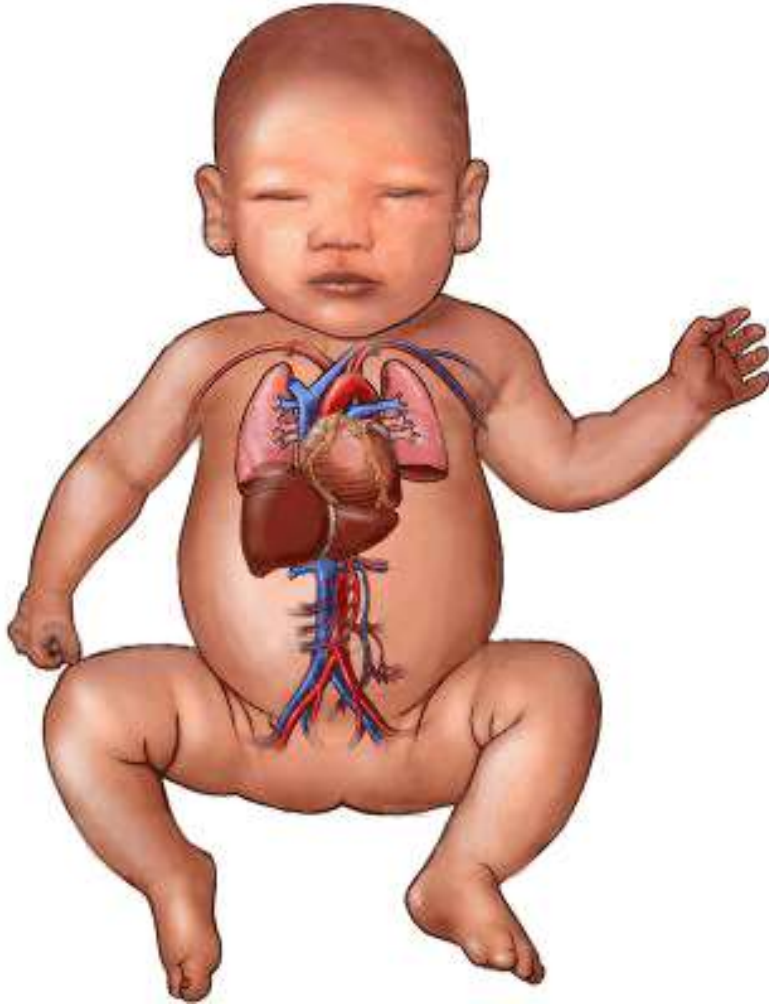
Petechiae, Ecchymosis

Epistaxis, Gum bleeding

GI or CNS bleeding



Clinical Presentation



Hepatosplenomegaly (68%)

Lymphadenopathy (50%)

Bone pain (23%)

Limp, refusal to walk

Mediastinal mass (5 - 10%)

Dyspnea, respiratory distress

Testicular mass (painless, unilateral)

CNS infiltration (<5%)

Headache, Emesis, Increased ICP, Stiff neck

Cranial nerve palsy (III, IV, VI, VII)

What are the stages of ALL ?

**There is no
staging in ALL**



اِذَا ضَلَّيْتُ
فَاَوْجِعْ
وَ اِذَا اطْعَمْتُ
فَاَشْبِعْ

اگر ستمگر را زدی، او را
آزار بده. اگر گرسنه را سیر
کنی سیرش خواهی کرد.



Stages of treatment is just like a military battle

Induction of remission = "شروع دوره بهبودی"

Consolidation = "مرحله تحکیم"

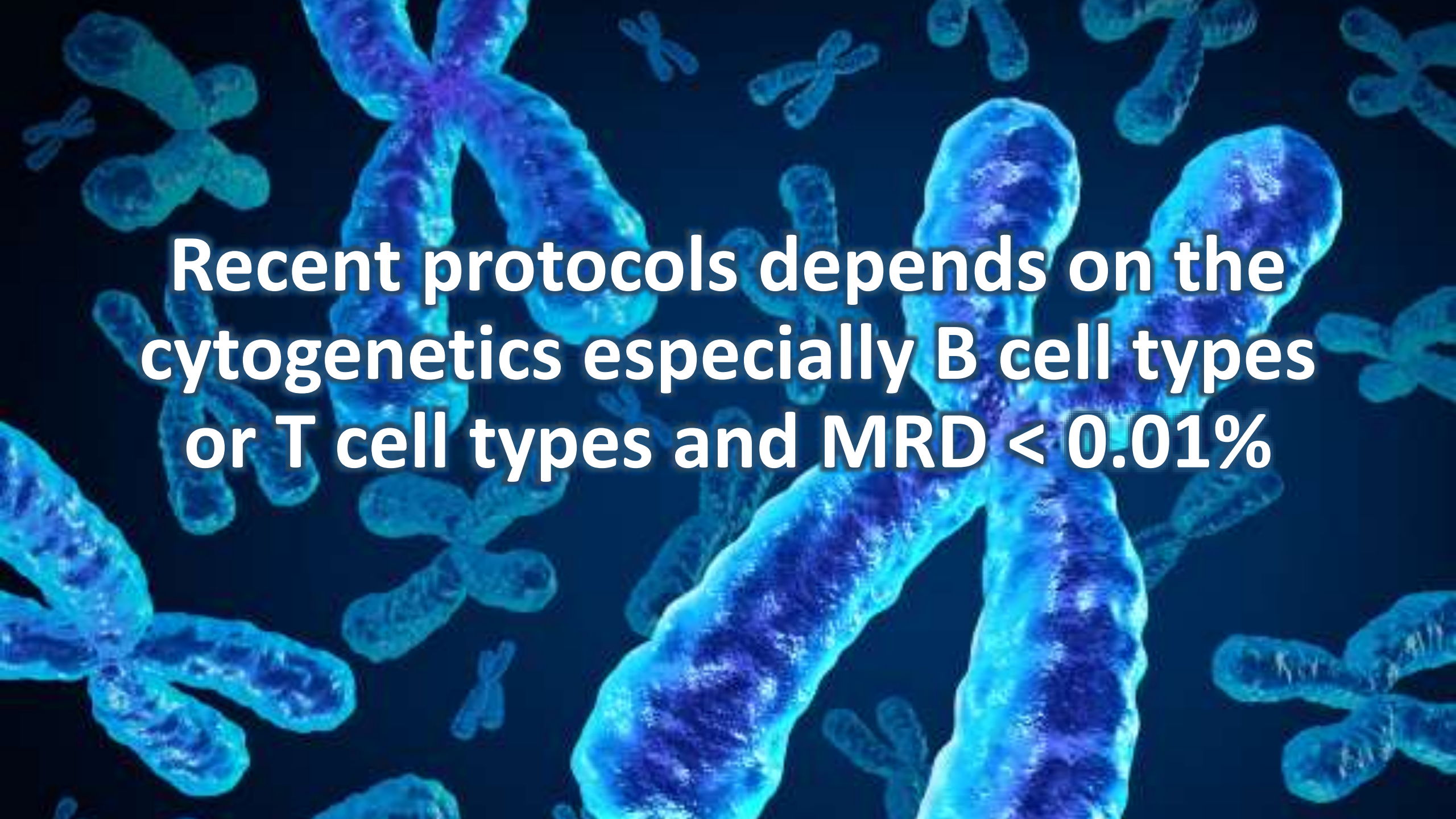
Maintenance = "درمان نگهدارنده"



Dr. Donald Pinkel

(American Pediatric hemato-oncologist, first director of St. Jude Children's Research Hospital)

“ Each patient select his own protocol ”

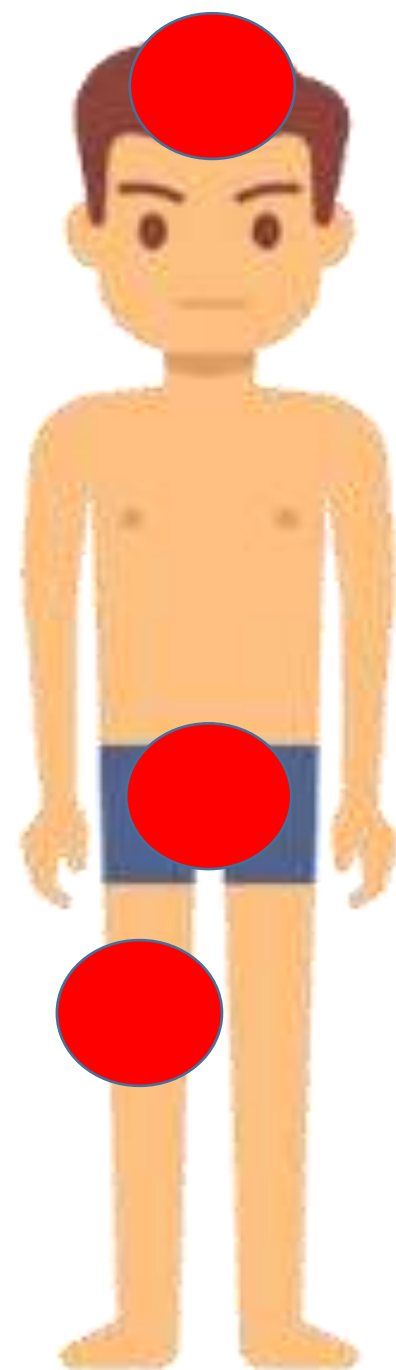


**Recent protocols depends on the
cytogenetics especially B cell types
or T cell types and MRD $< 0.01\%$**

The worst event event is relapse

- **CNS relapse**
- **Bone Marrow relapse**
- **Testicular relapse**

**which have decreased greatly with
the recent protocols**



Types of CNS relapse in ALL

- Mononeuropathy especial 6th cranial nerve palsy
- Increase Intracranial Pressure
- Meningitis
- Eye involvement
- Hypothalamic syndrome



The most constant bad prognostic initial features are:

- Age < 1 year or > 10 years**
- Initial WBC count > 50,000**



Can you prevent Leukemia?



No





Thank you