

# **Pediatric Oncology in Kuwait**

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Pediatric Solid Tumors  
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# Types of childhood cancers

## Blood cancers

### **Leukemias:**

- Acute lymphoblastic leukemia ( ALL)
- Acute myeloid leukemia ( AML)
- Chronic myeloid leukemia ( CML)
- Other rare conditions

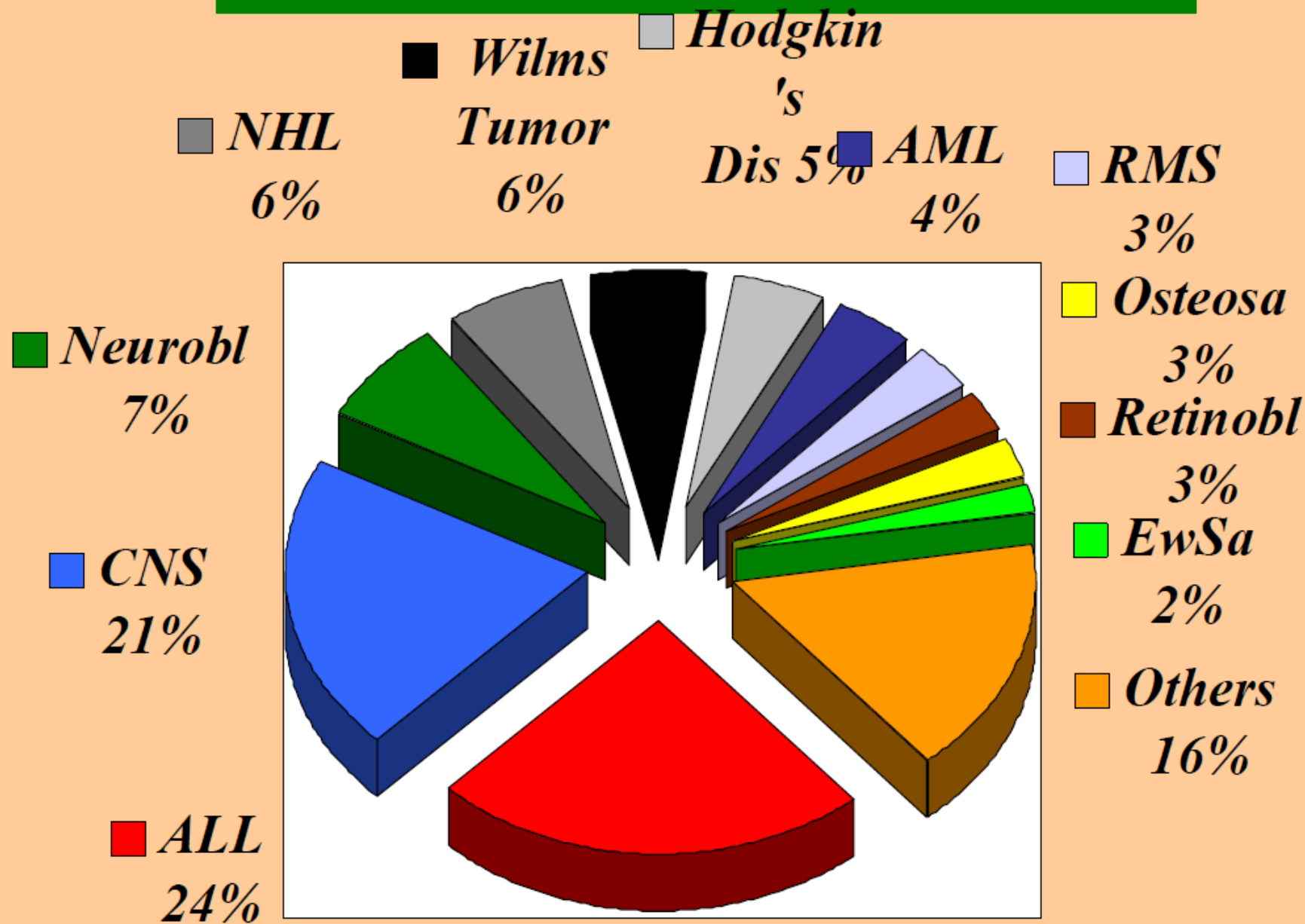
### **Lymphomas:**

- Hodgkins Lymphoma (HD)
- Non Hodgkins Lymphoma (NHL)

## Solid tumors

- Brain tumor
- Wilm's tumor ( Kidney)
- Neuroblastoma
- Soft tissue sarcomas ( muscles and other tissues)
- Bone tumors
- Retinoblastoma ( eye cancer)
- Hepatoblastoma ( liver cancer)
- Cancers of testis and ovary

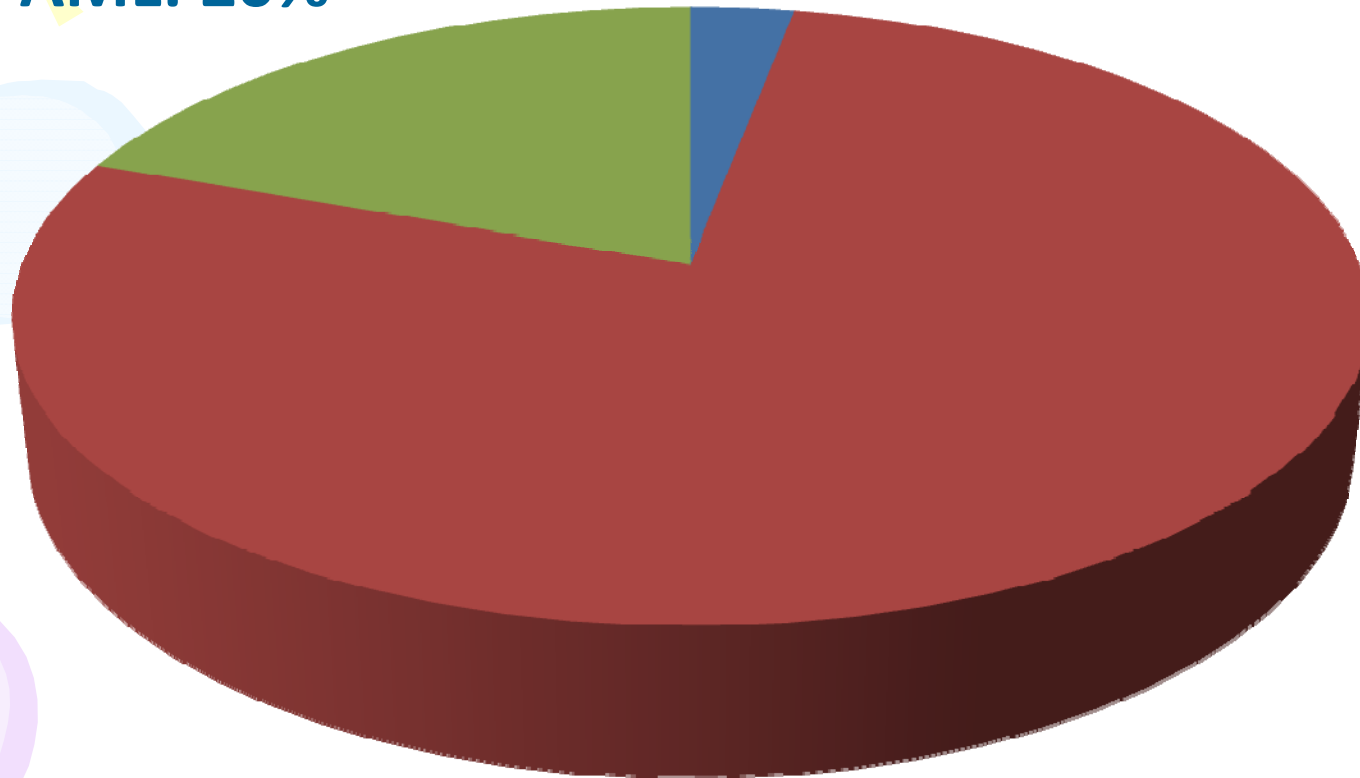
# Distribution of Cancer in Children <15 Yr



# Distribution of childhood leukemias (<15yr)

CML/MDS: 5%

AML: 20%



- ALL
- AML
- CML/MDS

ALL: 75%

# Incidence of cancer in children and adults

<b>Cancer</b>	<b>Children</b>	<b>Adults</b>
• Act. Leukemia	28%	2.3%
• CNS tumors	21%	1.6%
• Lymphomas	11%	4.3%
• Neuroblastoma	7.5%	<1%
• Wilm's tumor	6%	<0.5%
• Soft tissue sarcoma	6%	<0.5%
• Others	12.5%	>90%

# Some facts about pediatric tumors

- Median age: 6 years
- Increased number in first 2 years of life
- Overall survival:
  1. 1970's: 40%
  2. 1990's: 65 – 70%
  3. 21<sup>st</sup> century: reaching > 80%
- Solid tumors were not treated with chemotherapy until late 60's - early 70's
- Childhood solid tumors a unique biological makeup
- Cure occurs with multi modality therapy (Chemo + RT + Surgery)
- Focus is now shifting on reducing long term toxicities



# Pediatric Hematological Solid Tumors

- 1. Hodgkin's Lymphoma
  - 1. Non Hodgkin's Lymphoma
  - 2. Histiocytic Disorders (LCH / HLH)
- } 15%

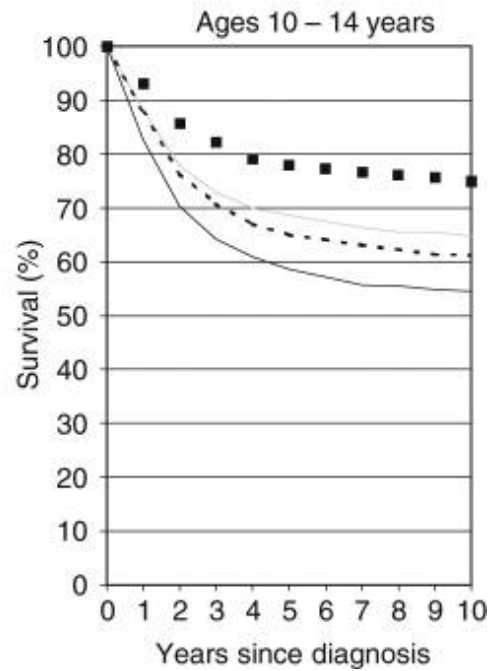
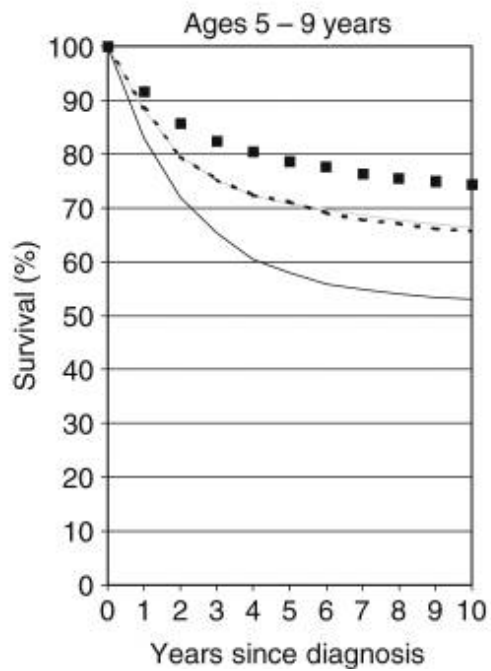
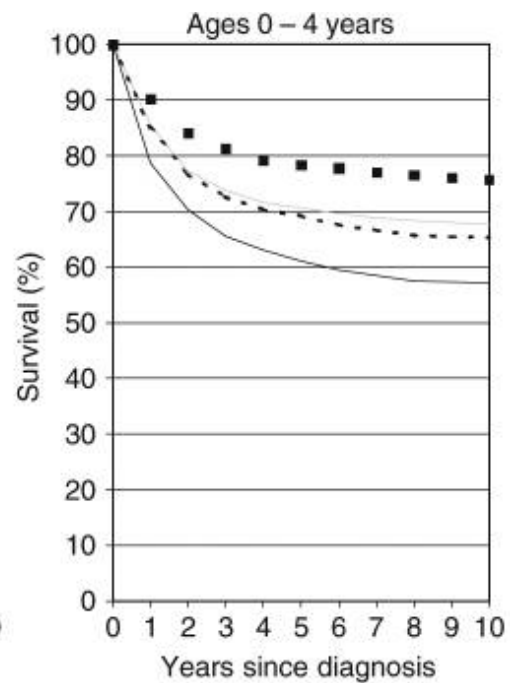
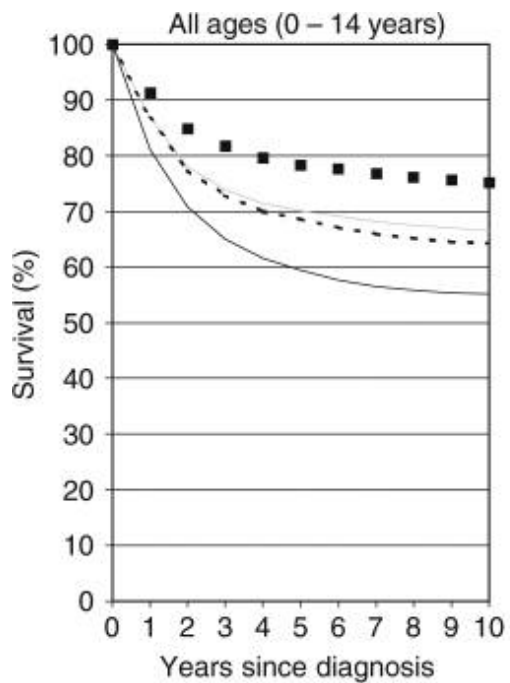
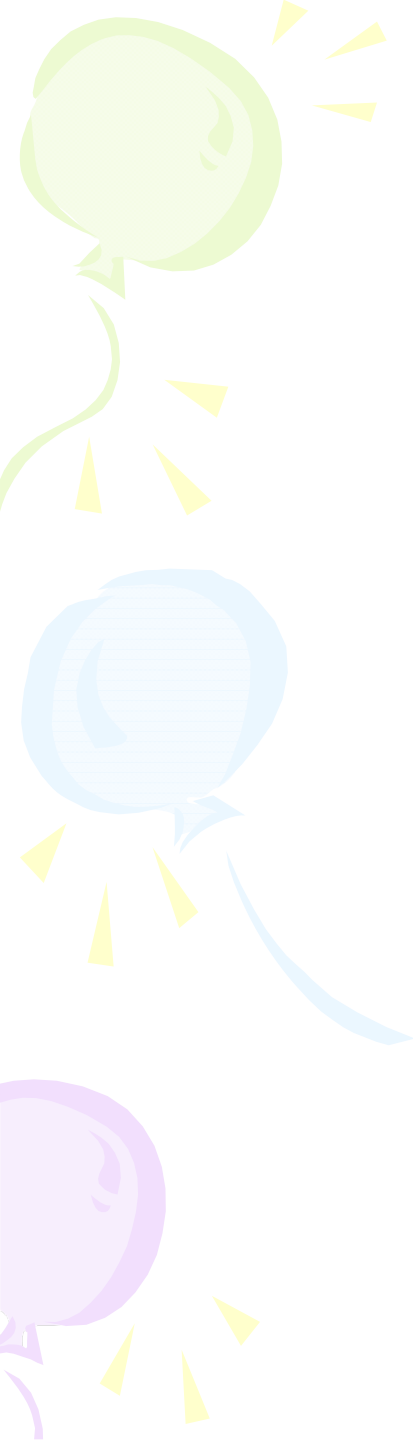


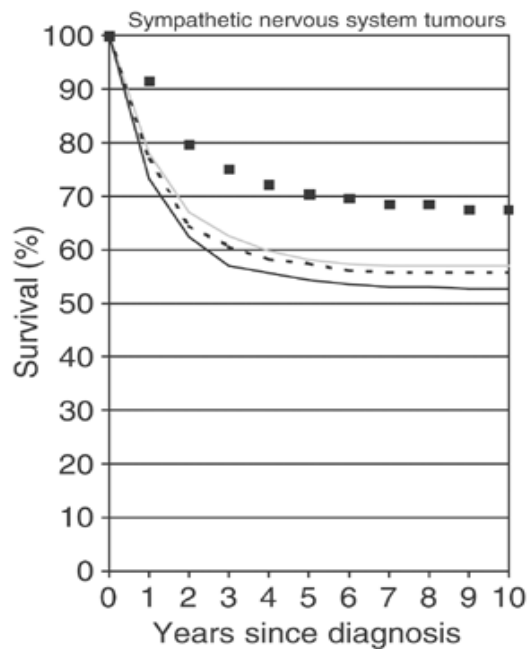
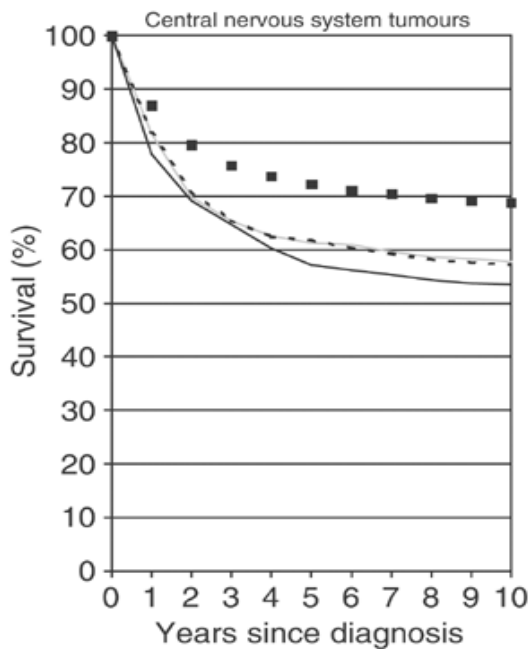
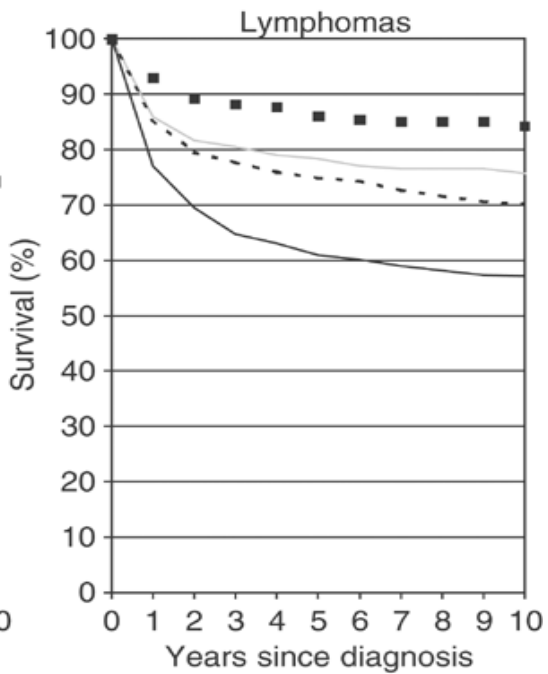
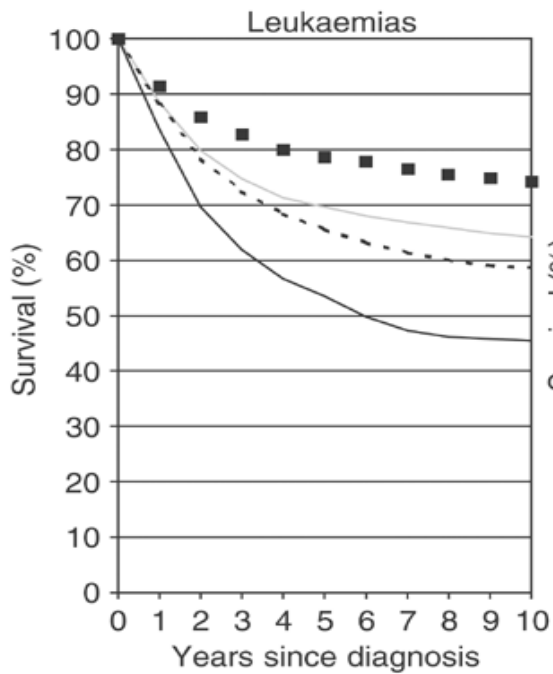
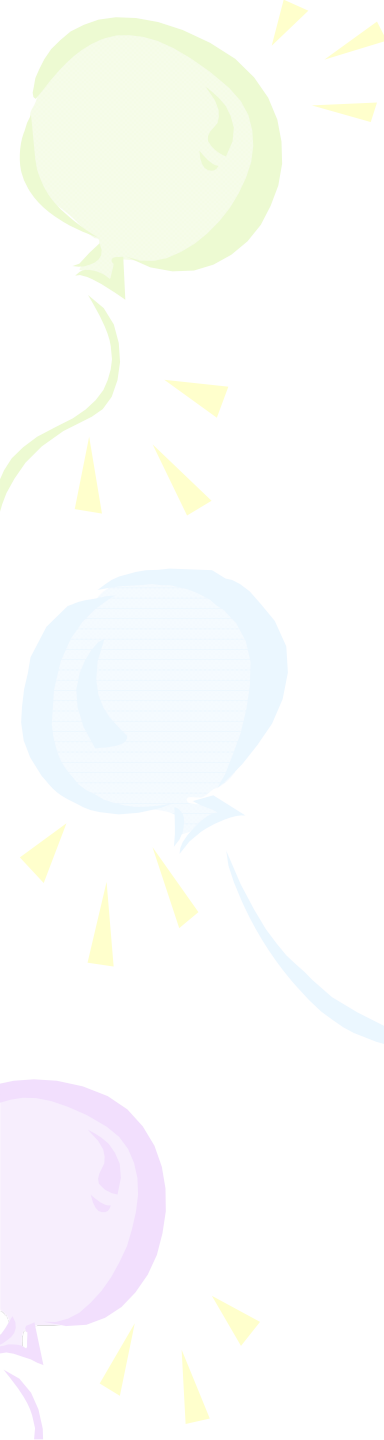
# Common Solid tumors

- Brain tumor
- Wilm's tumor ( Kidney)
- Neuroblastoma
- Soft tissue sarcomas ( muscles and other tissues)
- Bone tumors
- Retinoblastoma ( eye cancer)
- Hepatoblastoma ( liver cancer)
- Germ cell tumors (tumor of gonads)

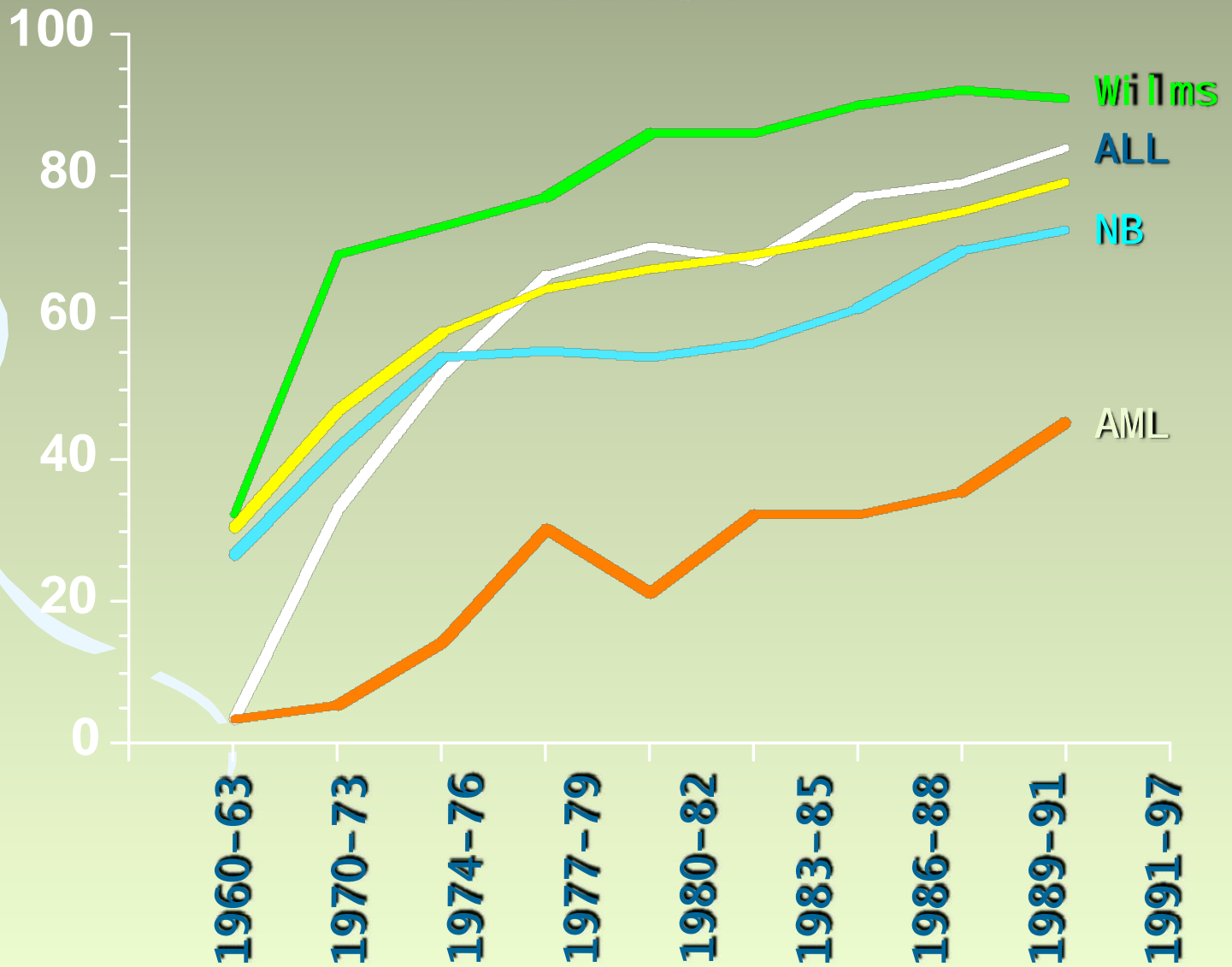
# Approach to a child with solid tumor

- Confirmation of diagnosis.
- Full staging work-up.
- Risk categorization.
- Selecting the right protocol.
- Ideally there should be a MDT between oncologist, radiation oncologist, pediatric surgeon, radiologist, and pathologist.
- Treating the child as per protocol.





# Childhood Cancer Survival Trends

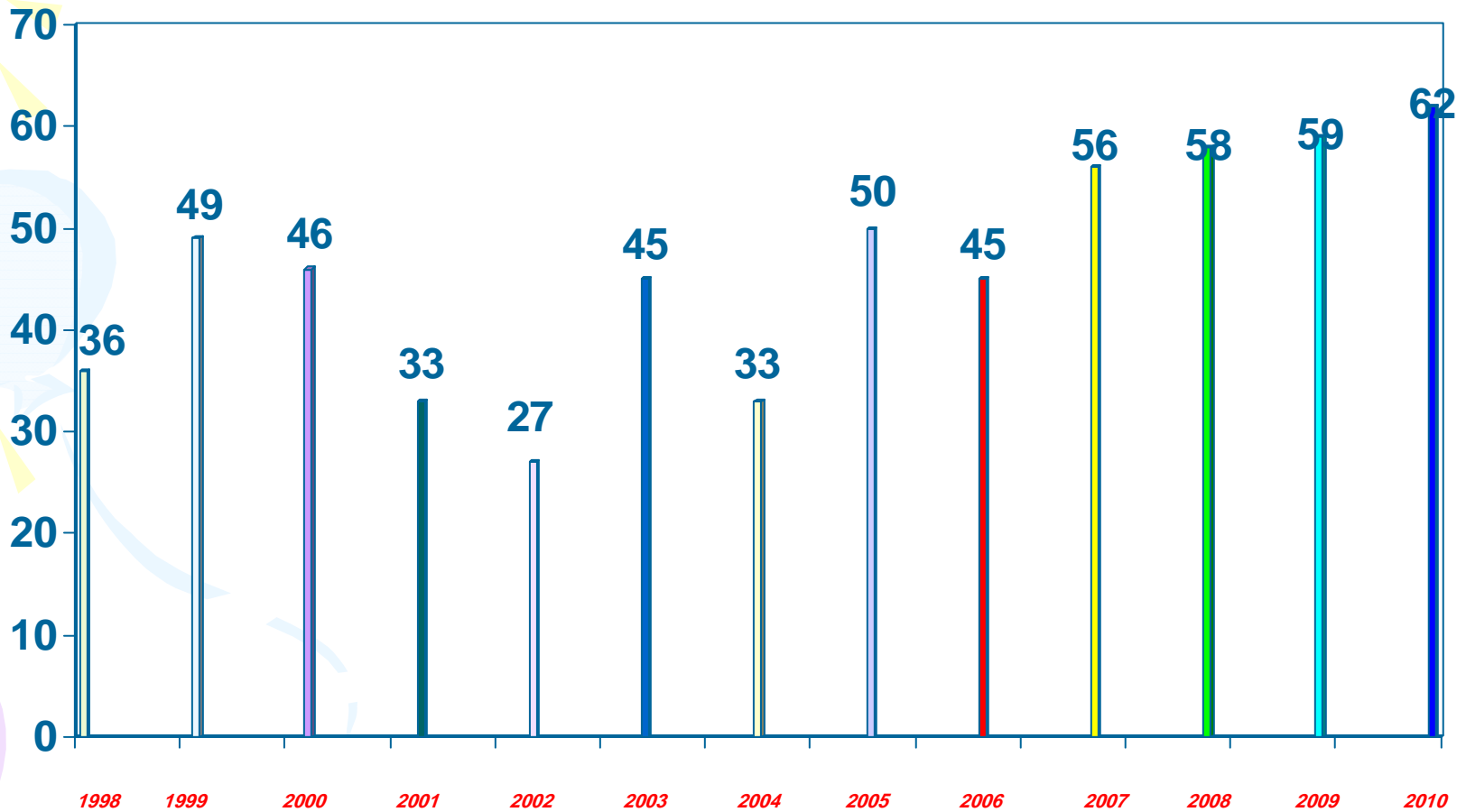


5 Yr Survival [%]

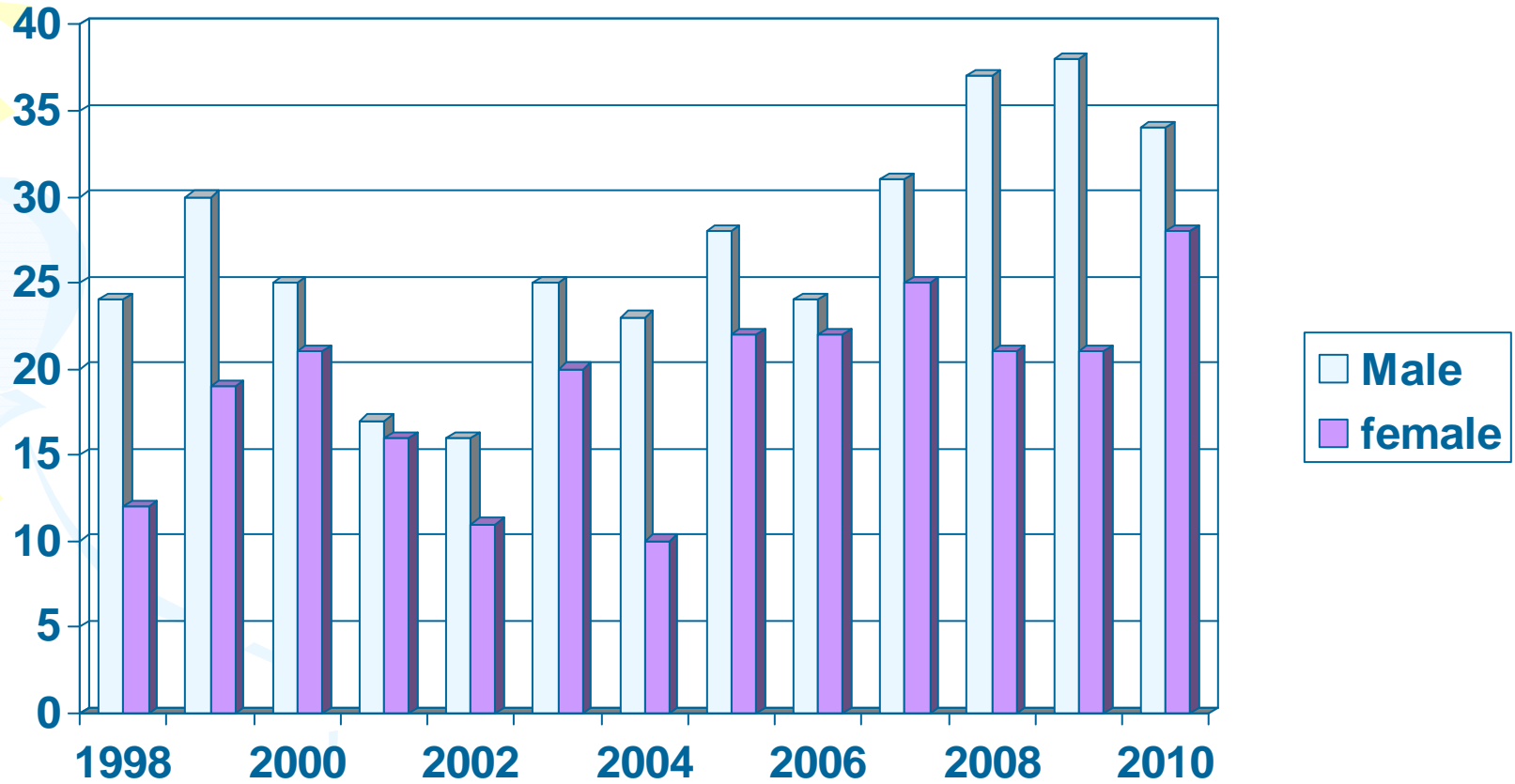
## Patient Data: Solid Tumors and Lymphomas – 1998 till 2010

Year	Total	K/NK	M/F	Neural	Brain	STS	ES	OS	NHL	HD	Wilms	GCT	Liver	Retino	LCH	Rare
1998	36	23/13	24/12	5	8	1	4	Nil	3	10	2	1	Nil	1	Nil	1
1999	49	31/18	30/19	5	11	7	1	3	4	5	4	5	2	Nil	Nil	2
2000	46	24/22	25/21	Nil	4	8	4	2	11	7	6	Nil	2	1	Nil	1
2001	33	17/16	17/16	4	5	1	3	Nil	1	7	5	Nil	1	2	3	1
2002	27	19/8	16/11	5	4	Nil	2	1	1	6	1	Nil	2	Nil	1	2
2003	45	22/23	25/20	4	10	3	5	2	3	9	2	3	Nil	Nil	Nil	1
2004	33	22/11	23/10	5	7	3	2	Nil	5	4	3	1	2	Nil	1	1
2005	50	31/19	28/22	8	8	5	4	1	5	5	1	4	Nil	1	3	4
2006	46	31/15	24/22	6	8	3	4	1	8	7	1	Nil	4	1	2	0
2007	56	37/19	31/25	7	11	4	2	Nil	4	7	7	2	3	Nil	5	4
2008	58	29/29	37/21	7	12	4	Nil	1	9	9	8	1	Nil	1	4	2
2009	59	35/24	38/21	5	9	2	6	2	7	6	6	4	3	2	6	1
2010	62	44/18	34/28	8	10	1	4	4	9	8	7	2	3	Nil	2	4
<b>Total</b>	<b>600</b>	<b>365/235</b>	<b>352/248</b>	<b>69</b>	<b>107</b>	<b>42</b>	<b>41</b>	<b>17</b>	<b>70</b>	<b>90</b>	<b>53</b>	<b>23</b>	<b>22</b>	<b>9</b>	<b>27</b>	<b>24</b>

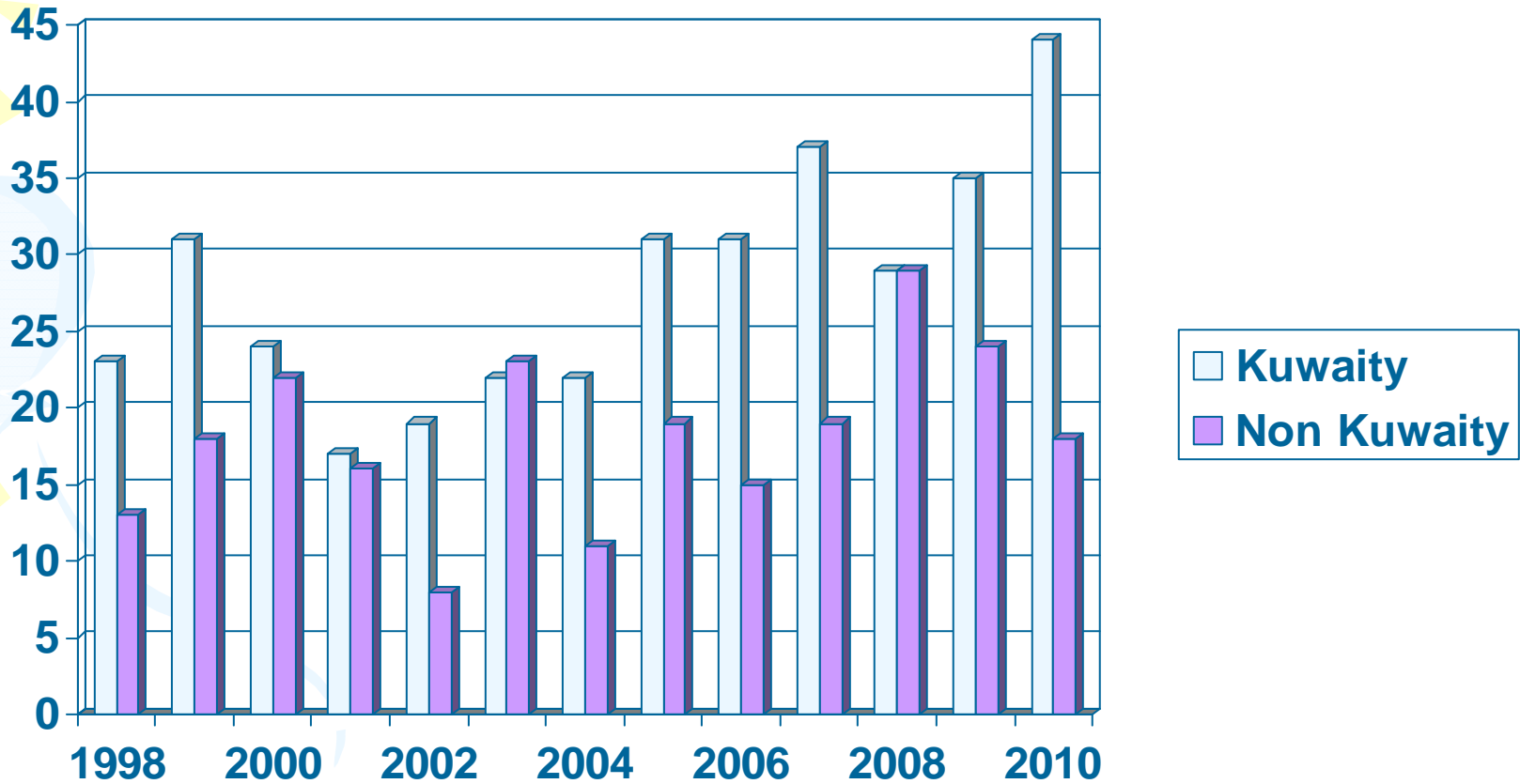
# Total Number of Patients: 12 years



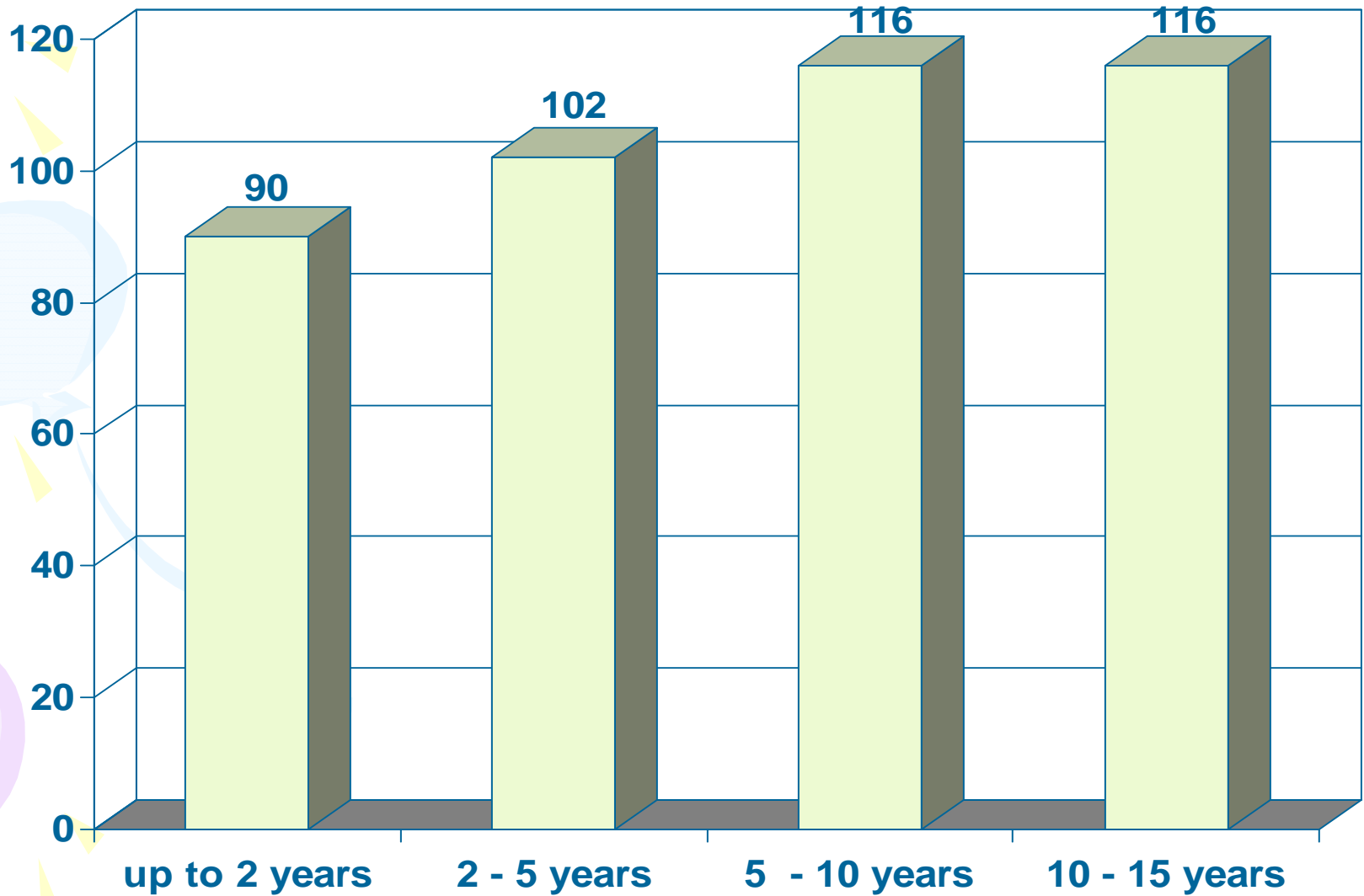
# Distribution by sex



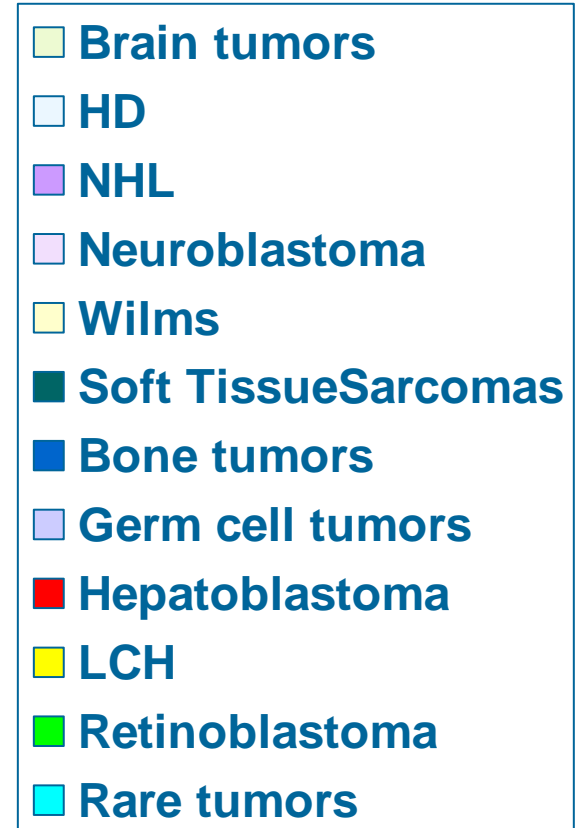
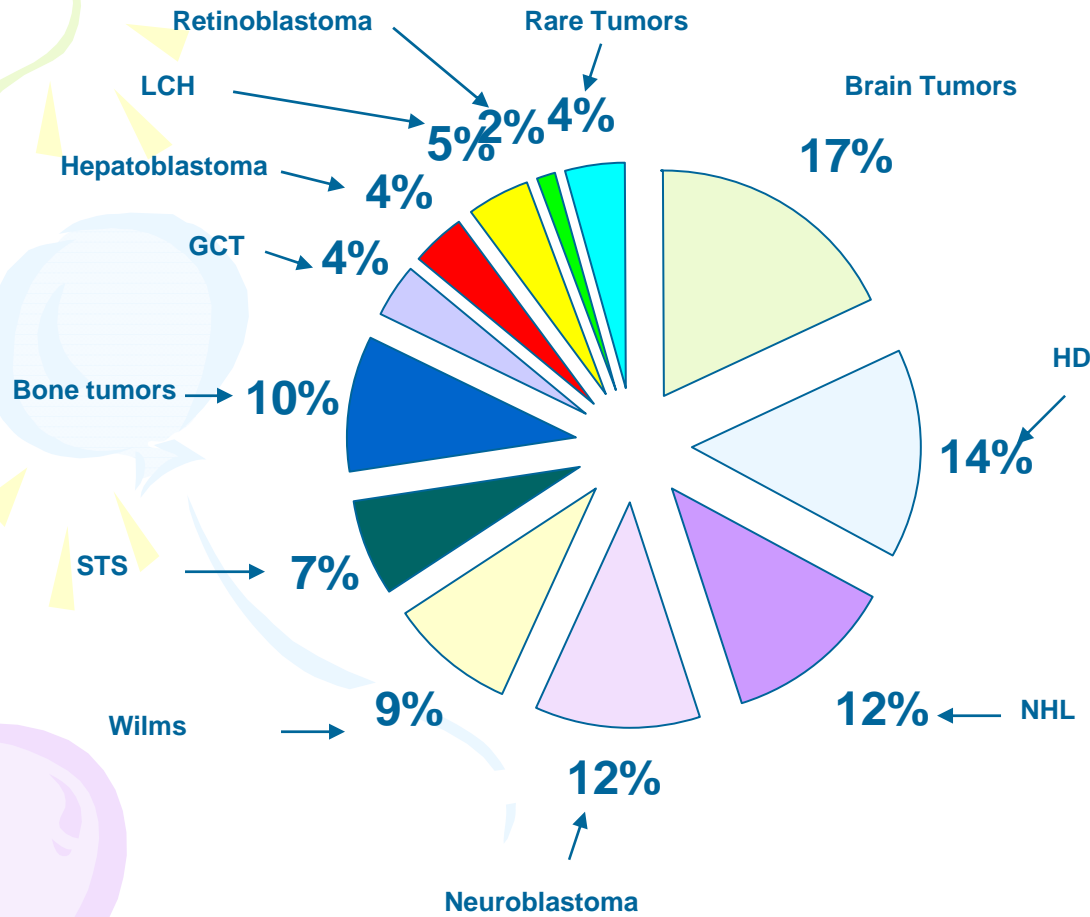
# Distribution by Nationality



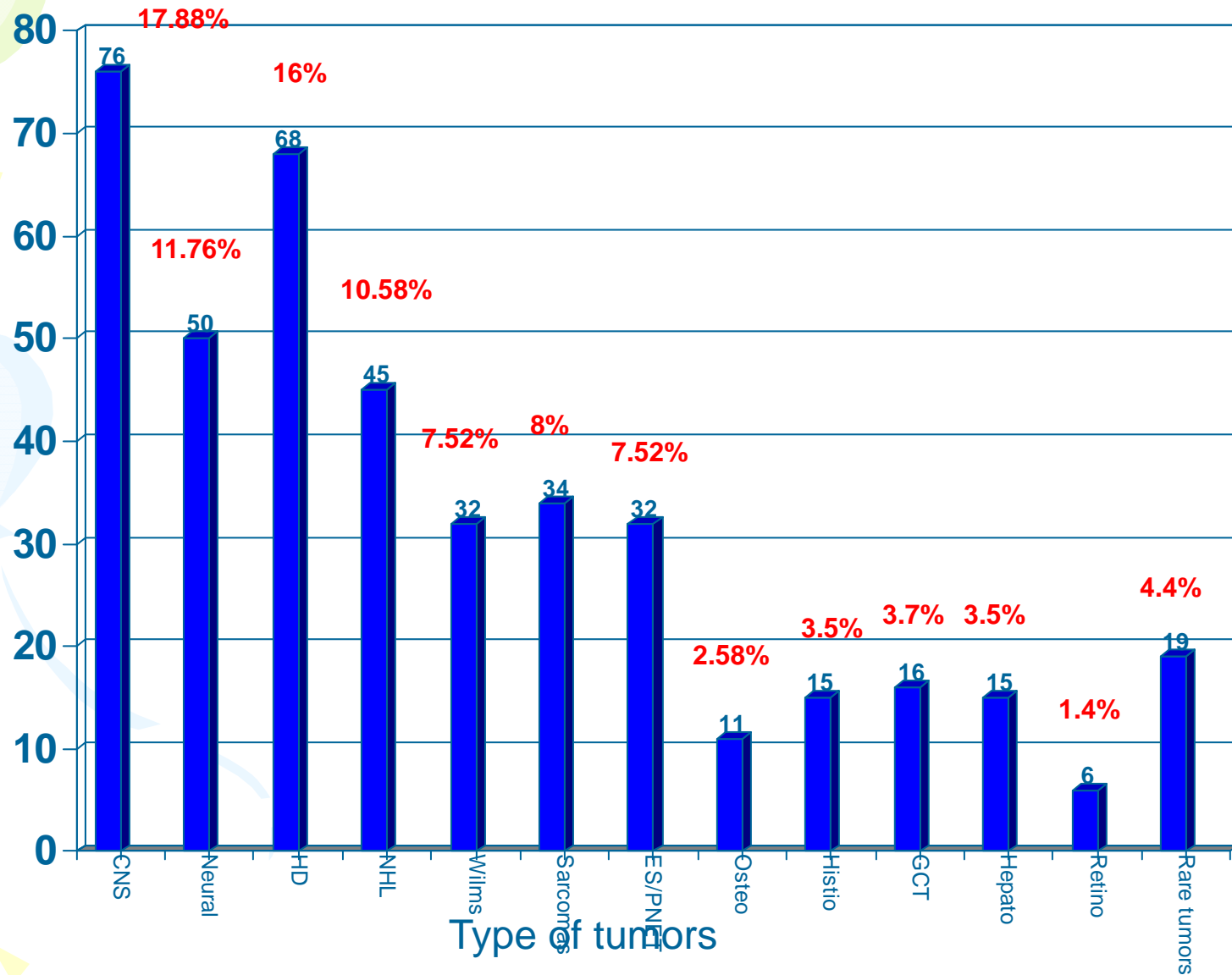
## Distribution by Age Groups

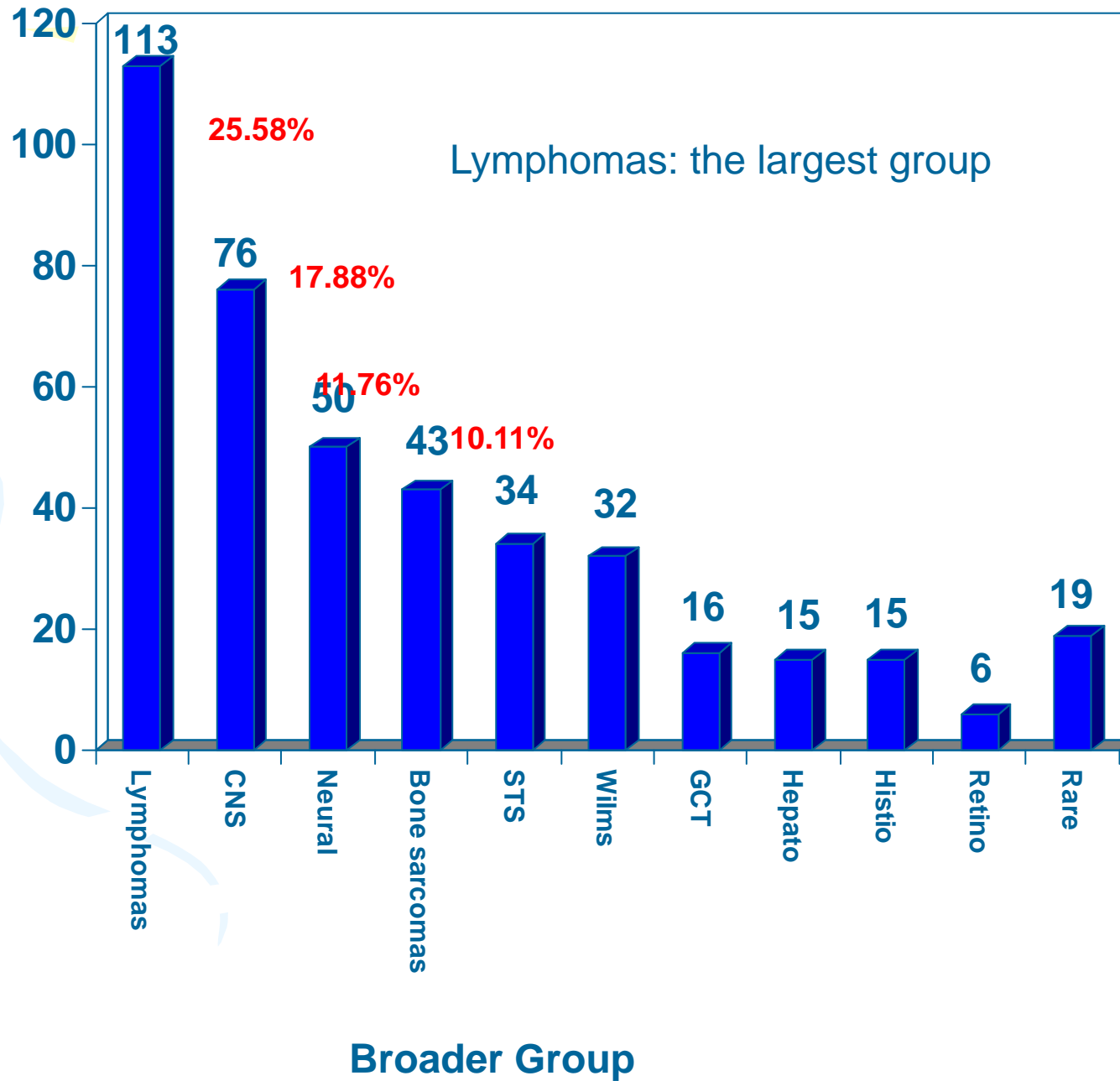


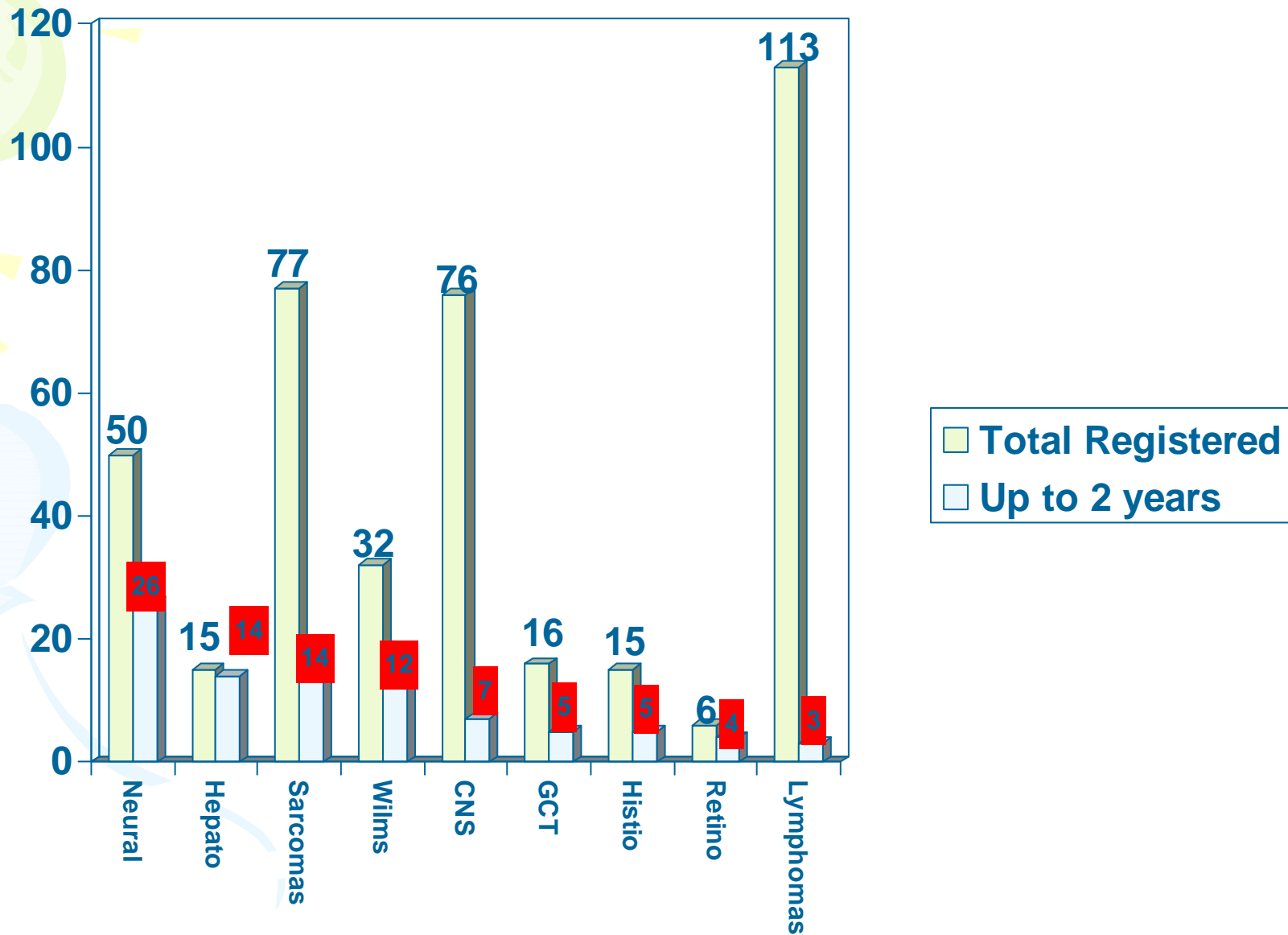
# Distribution of various solid tumors



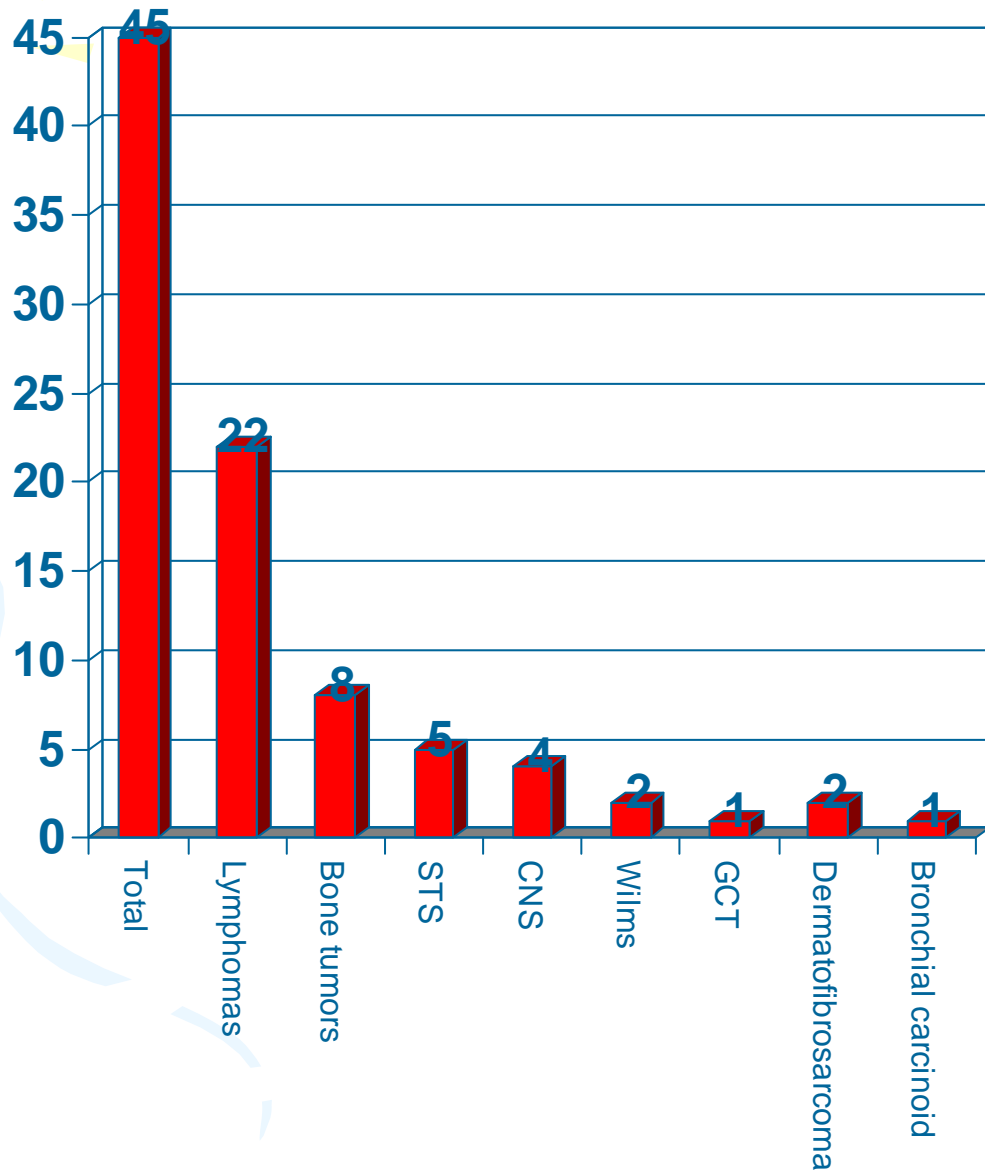
# Distribution of Various Malignancies







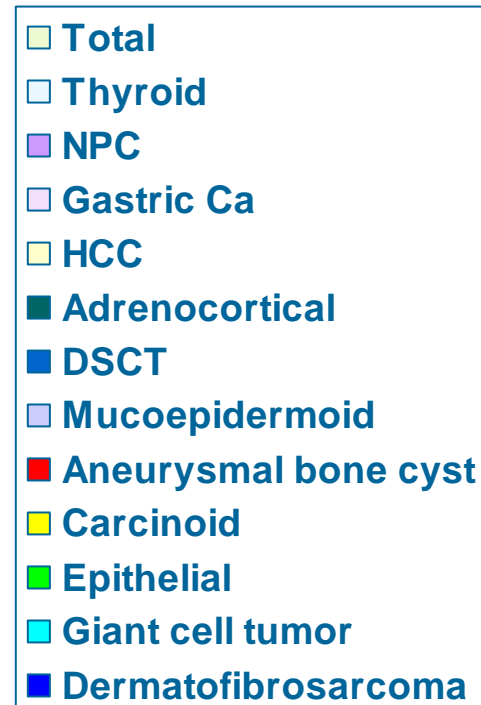
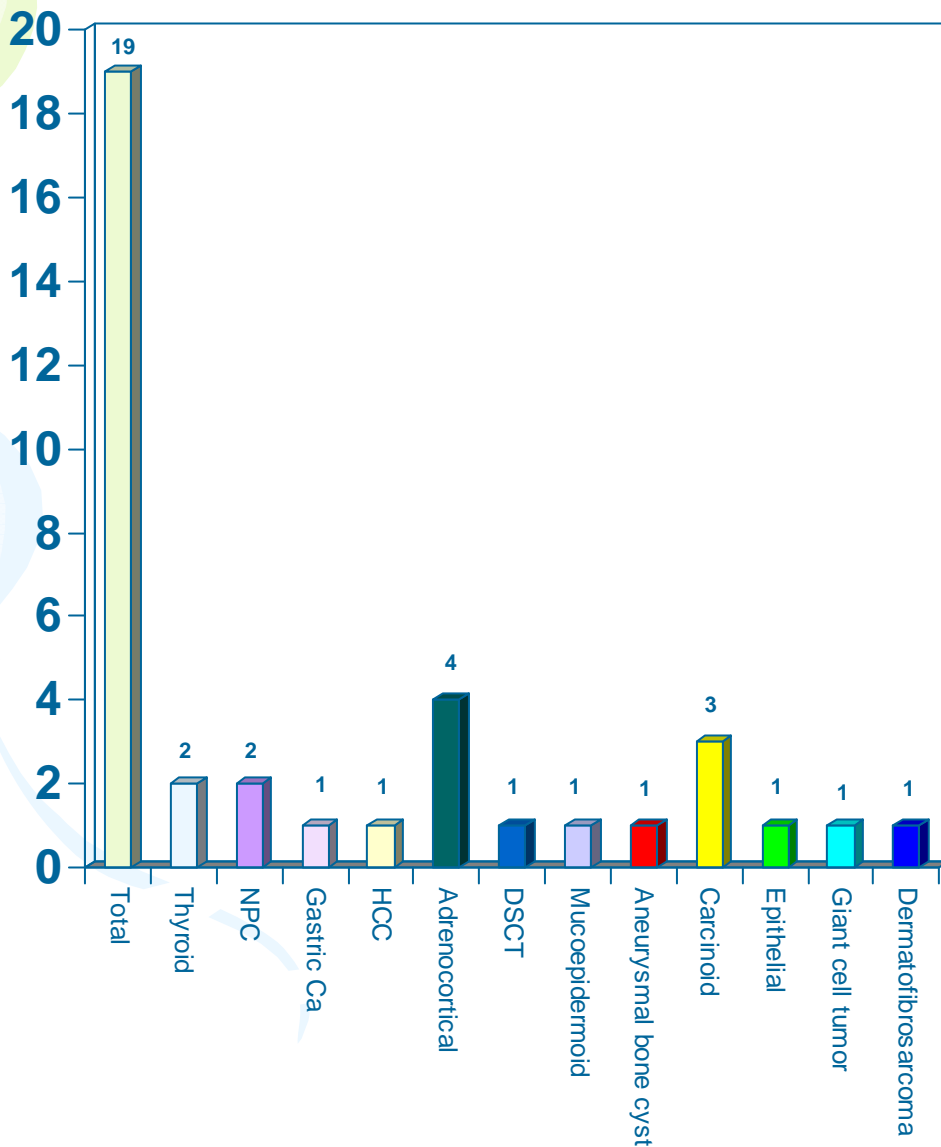
Type of malignancies in infants in relation to total registered



**Tumors in adolescents**

**Age group: 13 – 15 years**

# Rare Tumors





# Abdominal Tumors

Nearly 120 cases (30%) in 12 years

- Wilms' tumors (100%)
- Neuroblastoma (80%)
- Hepatoblastoma (100%)
- B – NHL (30 -35%)
- Soft tissue sarcoma (20%)
- Germ cell tumors (20%)
- Rare tumors (ACT, DSRCT, Gastric ca. etc)



# Survival

- Survival analysis for all malignancies not done.
- Survival for HD / NHL – between 85-90%
- Survival for Wilms tumor – 90%
- Sarcomas – 60%
- Neuroblastoma – 40%
- Brain tumors – 30- 40%

# Outcome of children with Hodgkin's disease

## A 10-year experience from a single institution in Kuwait

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Ahmed M. Ragheb, MS, MD, Juzer Ali, MBBS, MD.

### ABSTRACT

**الأهداف:** تقييم نتائج علاج الاطفال المصابين بمرض هودجكينز خلال العشر سنوات الاخيرة بمركز الكويت لمكافحة وعلاج السرطان.

**الطريقة:** شملت الدراسة 63 طفلاً، تم تشخيصهم بمرض هودجكينز بواسطة الفحص الباثولوجي، كما تم تصنيفهم تبعاً لنظام أن أربير للتدرج المرضي، خلال الفترة من يناير 1998 وحتى سبتمبر 2007 بوحدة أورام الاطفال - مركز مكافحة السرطان - الكويت.

**النتائج:** شملت الدراسة 37 ذكر (59%)، 26 أنثى (41%)، وكان متوسط الاعمار هو 10 عام (المدى 3-15 عام). وكانت الاعراض المرضية (ب) تمثل 32% (20 مريض)، والتضخم بالعدد يمثل 44% (28 مريض). كان 8 اطفال (13%) يعانون من الدرجة الثالثة من المرض، بينما 12 طفلاً (19%) كانوا يعانون من المرض في درجته الرابعة. تم استخدام العلاج الكيماوي كعلاج بدائي في 63 طفلاً، وقد تم علاج هؤلاء الاطفال بواسطة 6 جرعات كيميائية (2-8 جرعات)، وتم استخدام العلاج الإشعاعي في علاج 40 طفلاً (63%). وقد تم تسجيل الآثار الجانبية التالية: ضعف في فحوصات الدم من الدرجة الثالثة في 23 طفلاً (37%)، ومن الدرجة الرابعة في 14 طفلاً (22%)، وقصور في وظائف الغدة الدرقية في 20 طفلاً (32%). حقق 55 طفلاً (87%) استجابة كاملة للعلاج، بينما حقق 2 فقط (3%) استجابة جزئية، لذا كانت الاستجابة العامة 90%، وتطور المرض في 3 اطفال 5%، ولم نستطع تقييم الاستجابة عند 3 طفلاً آخرين (5%). كان متوسط زمن متابعة الاطفال 67 شهر (5.5 عام)، وكانت النسبة العامة للبقاء على قيد الحياة لهؤلاء الاطفال هو 91%.

**خاتمة:** العلاج المشترك الكيماوي و الإشعاعي ذو آثار جانبية متوسطة الخطورة، كما أنه علاج فعال للأطفال المصابين بمرض هودجكينز.

**Objectives:** To evaluate the outcome of children with Hodgkin's disease over a period of 10-years from a single institution in Kuwait.

**Methods:** Sixty-three children with previously untreated Hodgkin's disease, who were diagnosed at the Pediatric Oncology Unit of Kuwait Cancer Control Centre, Shuwaikh, Kuwait from January 1998 to December 2007 were included in the study. All cases were proved by histopathology, and staging was carried out according to the Ann Arbor system.

**Results:** Our series included 37 (59%) males and 26 (41%) females with a median age of 10 years (range 3-15 years). B symptoms were present in 20 (32%) children. Bulky disease was noted in 28 (44%) children, with stages III in 8 (13%) and IV in 12 (19%) children. Chemotherapy was administered as a primary treatment in 63 children. The median number of chemotherapy cycles given was 6 (range 2-8). Radiotherapy was used in 40 (63%) children. Grade III hematological toxicity was observed in 23 (37%) and grade IV in 14 (22%) children. Hypothyroidism was observed in 20 (32%) children. Fifty-five children achieved a complete remission (87%) and 2 children achieved a partial remission (3%) with an overall response rate of 90%. Three children achieved a progressive disease (5%) and response could not be evaluated in 3 (5%) children. At a median follow-up of 67 months (5.5 years), the overall survival was 91%.

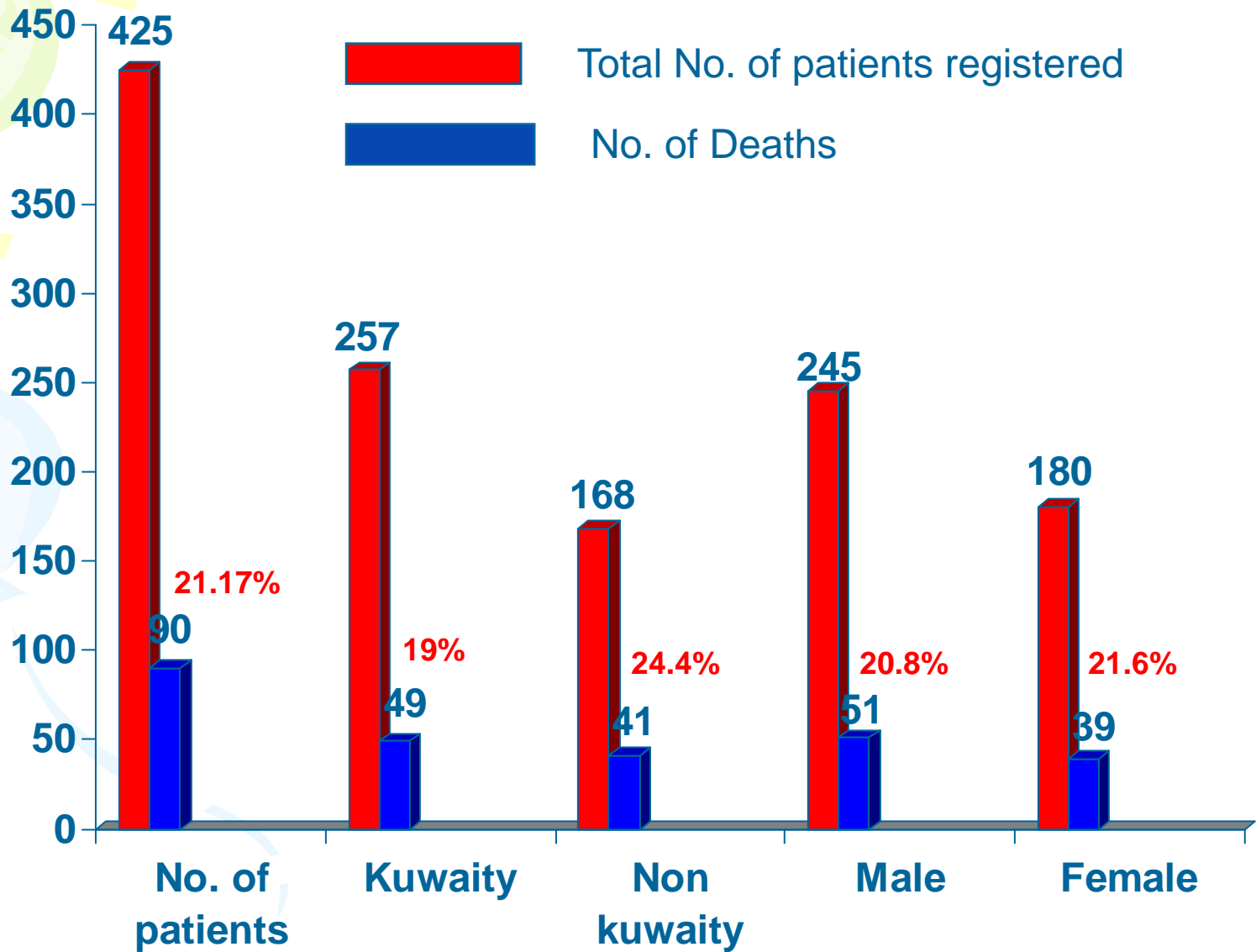
**Conclusions:** With moderate toxicity, combined modality therapy is effective in the treatment of childhood Hodgkin's disease.

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*From the Unit of Pediatric Oncology (Mittal, Khalifa N, Khalifa S), Department of Medical Oncology, and the Department of Radiation Oncology (Ragheb, Ali), Kuwait Cancer Control Centre, Shuwaikh, Kuwait.*

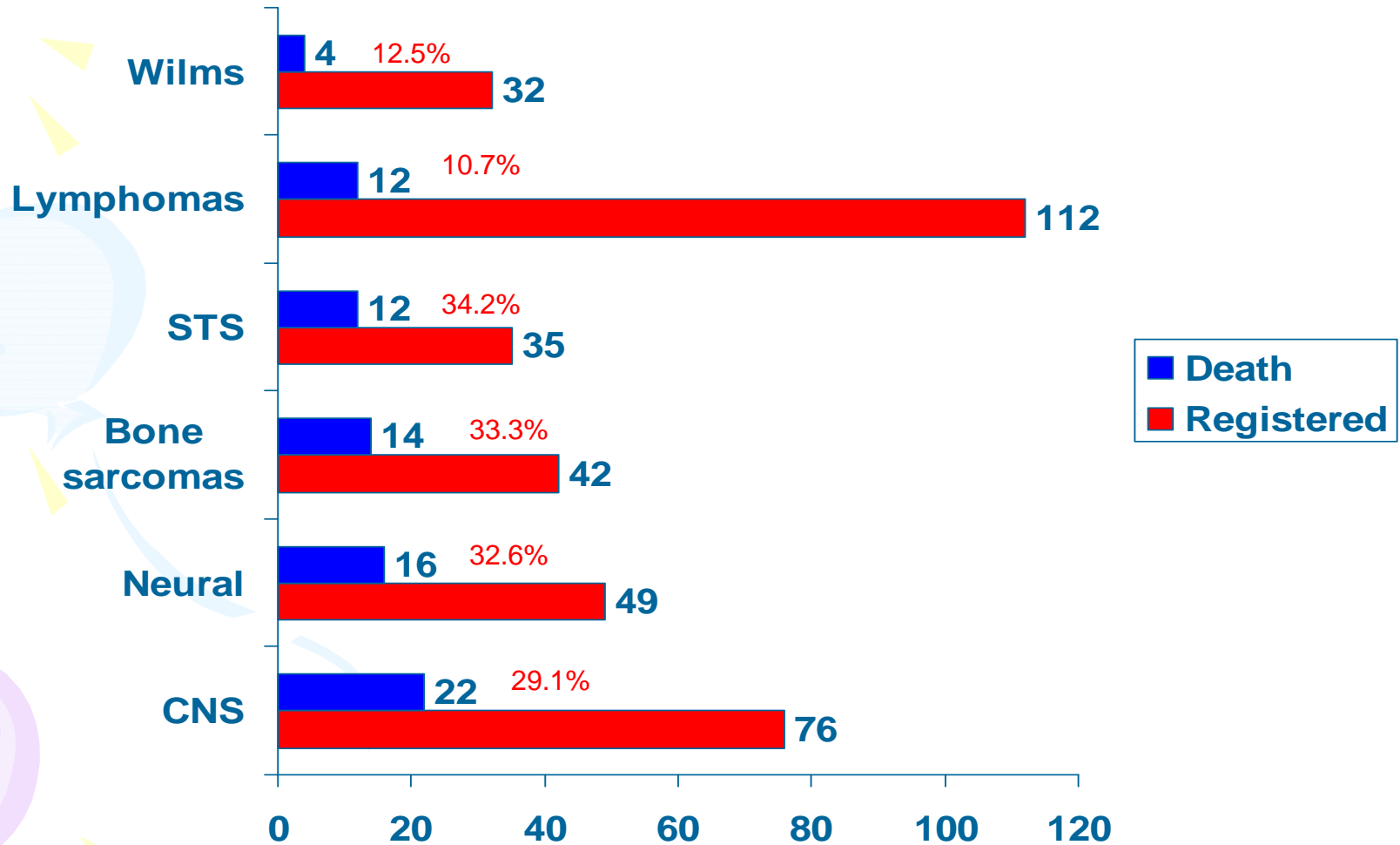
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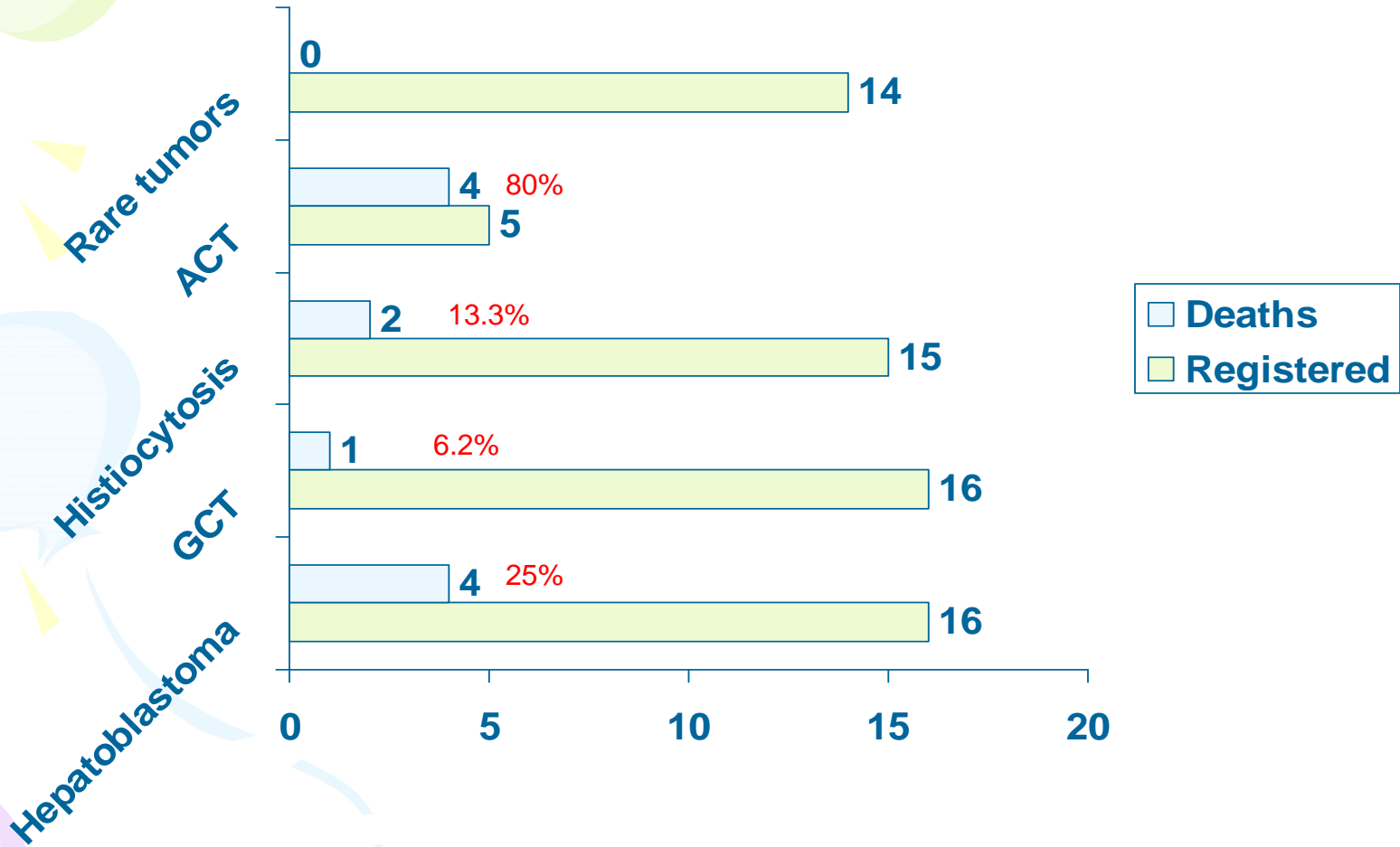


Deaths over 10 years period (1998 – 2007)

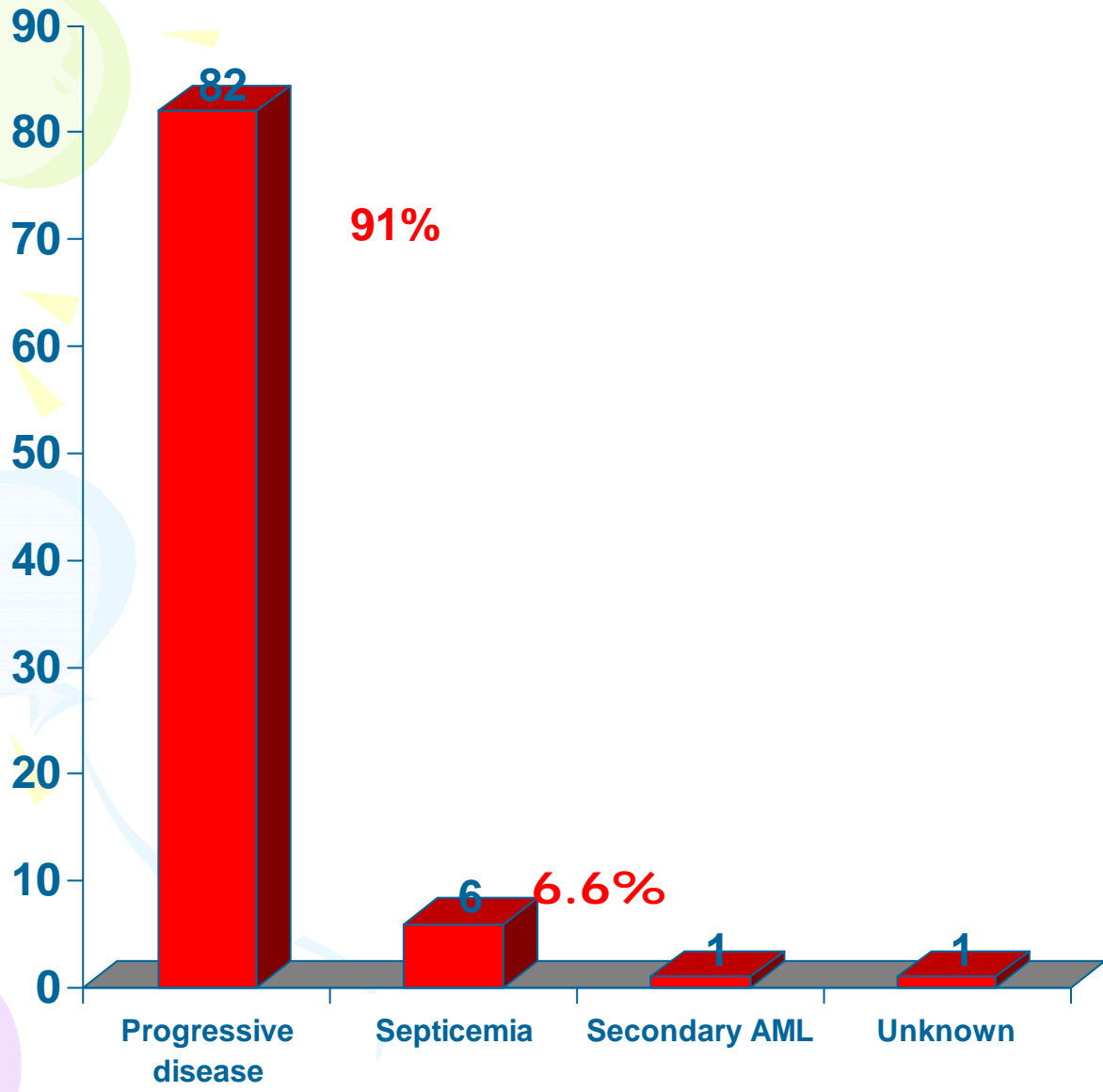
# Mortality in common malignancies



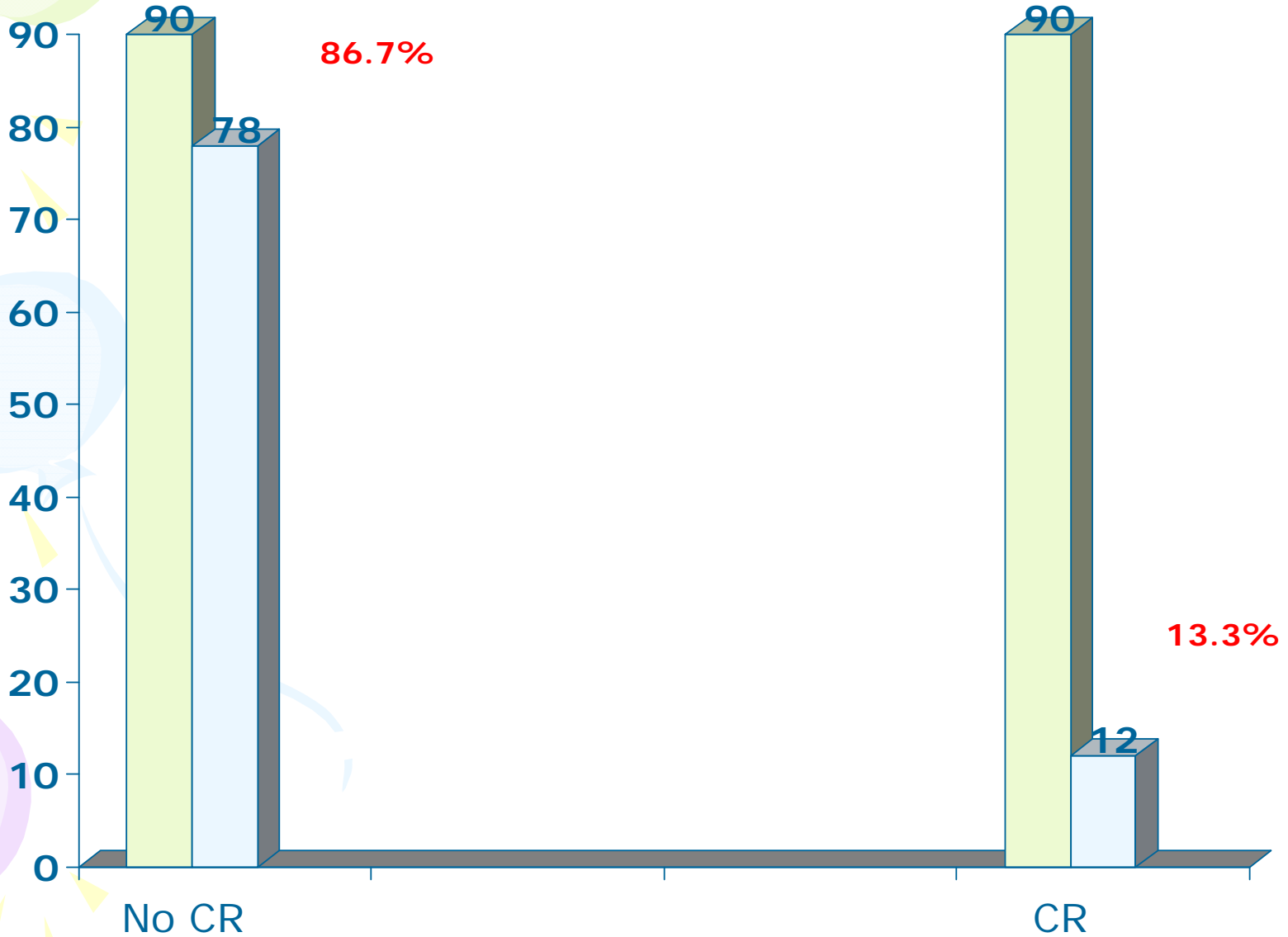
# Mortality in uncommon tumors



Causes of death



# Response to initial treatment



# Role of Nuclear Medicine in Pediatric solid tumors

- Initial Diagnosis
- Staging work-up
- Response Evaluation
- Relapse
- Follow-up
- Target Organs evaluation
- Therapy

# Initial Diagnosis / Staging work-up

- MIBG for Neuroblastoma
- PET scan for Lymphomas
- Bone scan for sarcomas / Neuroblastoma



# Response Evaluation

- PET scan for lymphomas
- MIBG for neuroblastoma
- Bone scan for sarcomas



# Relapse / Follow-up/ Therapy

- PET scan for lymphomas / sarcomas.
- Bone scan for symptomatic bone / follow-up of patients with bone metastasis.
- MIBG for suspected relapse or even as follow-up.
- MIBG therapy for advanced neuroblastomas.



# Target Organ Evaluation

- MUGA for cardiac assessment.
- Renal scan: for renal function (not accurate)
- Ideal test for GFR in children: Cr51 EDTA GFR or Tc99m DTPA method (not available in Kuwait)



# Pediatric Solid Tumors

- Treatment of pediatric solid tumors is a multi- modality treatment.
- Surgery is an important aspect of management for good local control.
- Radical surgery can be an initial event, but in majority of cases it is done after partial or complete chemotherapy.
- Regular meetings between ped. oncologist, radiation oncologist, ped. surgeon, radiologist and pathologist is a must.
- Pediatric oncologist is the primary care physician for children with solid tumors.
- Treating children with cancer is a painful but gratifying experience.



**Thankyou**