1996
ANNUAL REPORT
OF THE
TUMOR REGISTRY

KING FAISAL SPECIALIST HOSPITAL & RESEARCH CENTRE
RIYADH, KINGDOM OF SAUDI ARABIA

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The Cancer Program is a combined effort of many individuals. It is not possible to enumerate all the nurses, technicians, therapists, pharmacists, dentists, physicians, scientists, social workers and others whose work is primarily on behalf of the patient with cancer. In addition, nearly everyone associated with the hospital comes in contact with the cancer patient from time to time, frequently contributing significantly to their care. The staff of the Tumor Registry and members of the Tumor Committee recognize this hospital-wide involvement in the care of cancer patients. The information in this report is provided to assist all health care professionals to better understand the problems faced in treating patients with cancer.

The following Departments have assisted throughout the year and without their invaluable support this report would not be possible. The Tumor Registry staff acknowledges these Departments:

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Medical Records Services
Department of Oncology
Home Health Care

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1996 ANNUAL REPORT OF THE TUMOR REGISTRY

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I. KING FAISAL SPECIALIST HOSPITAL & RESEARCH CENTRE CANCER PROGRAM ACTIVITIES

TUMOR REGISTRY

The King Faisal Specialist Hospital and Research Centre (KFSH&RC) opened in June 1975 to provide specialized medical treatment to the people of Saudi Arabia and to promote the prevention of disease through research and education. It is a national and international tertiary care hospital for Oncology and the principal center for cancer therapy in Saudi Arabia.

The KFSH&RC Tumor Registry is a hospital-wide data system designed for the collection, management, and analysis of data on patients with the diagnosis of a malignant neoplasm (cancer). The Registry was established to meet one of the requirements for an Approved Cancer Program of the American College of Surgeons (ACoS) and is under the supervision of the Tumor Committee. The database now includes 32,980 malignant cases seen at KFSH&RC from June 1975 through December 31, 1996. More than 2,000 new cases are added annually.

The Registry is staffed with certified tumor registrars who support the database in case ascertainment, abstracting, follow up and statistical analyses. The basic source document is the patient's medical record from which pertinent information is abstracted for use in the Registry. The electronic data system used is the Cansur 3.0 designed by the ACoS in which the details of each diagnosed cancer case is entered and stored. (Please refer to Figures 1-A to 1-D for a sample data set.)

The data maintained in the Tumor Registry provides the statistics for the publication of the KFSH&RC annual report which summarizes the hospital's cancer experience. The data also supports a wide variety of reports at the request of physicians, researchers, and ancillary personnel. These reports support patient management and outcome, basic and clinical research investigations, educational publications and presentations, and resource utilization. In 1996, the Tumor Registry supported 38 data requests (see Appendix A for a listing of requests for Tumor Registry data). It also identified and reported to the National Cancer Registry 2,175 cases seen in 1996 that were diagnosed on or after 01 January 1994.

TUMOR COMMITTEE

The multidisciplinary Tumor Committee, which meets bimonthly, is the policy-making body of the Cancer Program at KFSH&RC (see Appendix B for membership listing). During 1996, the Committee provided professional and administrative guidance to the Tumor Registry and its most prominent achievements include the following:

Recruited an additional Assistant Tumor Registrar to complement the present staff of the Tumor Registry.

Coordinated with the Computer & Hospital Information Centre (CHIC) in adapting the computerized cancer staging forms. CHIC has finished entering 20 forms in the hospital computer system which could be printed from any terminal with access to the mainframe or the e-mail. These forms will be submitted to the Forms Committee for approval and implementation.

Helped in establishing multi-disciplinary combined clinics, the latest to be developed was the Combined Colorectal Clinic.

Published three brochures on three different cancers, i.e., breast cancer, ovarian cancer and lymphomas (including Hodgkin's Disease). A fourth one, on gastric and esophageal cancers, is ready for printing; and a fifth one, on colorectal cancer, is under final preparation.

TUMOR BOARD

This educational conference is held as frequently as twice a month for the benefit of the attending staff, house staff, allied health professionals and visiting attending staff from other hospitals. Cases of various types of malignant disease are selected for presentation on the basis of complexity, unusual manifestations of the disease, or interest. Each presentation includes an outline of the medical history, physical findings, clinical course, radiographic studies, and pathological interpretations. Following each presentation, there is an informal discussion of the case and a review of pertinent medical literature. Those attending are encouraged to share personal experience in the management of similar cases. Please refer to Appendix C for a summary of cases presented in 1996.

ONCOLOGY GRAND ROUNDS

This didactic conference is held every other week and is attended by the Medical staff and allied health professionals. Speakers are drawn from the KFSH&RC Medical and Research staff as well as from visiting guests. Please refer to Appendix D for a listing of the topics presented at the Oncology Grand Rounds in 1996.

FIGURE 1-A

PATIENT NAMEPLATE

KING FAISAL SPECIALIST HOSPITAL AND RESEARCH CENTRE

CANCER REGISTRY WORKSHEET
(CanSur 3.0)

PF 10 TACS – ACCESSION FILE MAINTENANCE

ACCESSION NUMBER (ACSN) : 8 7 0 1 2 3

TUMOR SEQUENCE (SEQ) : 0 0

Malignant/In situ tumors	Benign tumors
00 - One primary only	XX – One primary only
01 - First of two or more	AA – First of two or more
....	....
98 - 98th or later primary	III – 6th or later primary
99 - Unspecified sequence	II – Unspecified sequence

THIS CANCER ACCESSION YEAR : 8 7

MEDICAL RECORD NO. : 3 9 4 6 5 7

CASE STATUS : 3

0 – Suspense
1 – Incomplete
3 – Completed per Release 3

PATIENT NAME

Last : _____

First : _____

Second : _____

Third : _____

ADDRESS AT DIAGNOSIS

P.O. Box _____

Riyadh
City

R Y
Prov.

ZIP Code: _____ - _____

PF 11 TPAT – PATIENT IDENTIFICATION

SAUDI ID : 1 2 3 4 5 _____

BIRTHDATE: 0 1 / 0 1 / 1 9 4 6

AGE AT DX : 0 4 1

SEX : 2

1 – Male (2) Female 9 – Unknown

NATIONALITY : 0 0

(00) Saudi	04 – Yemeni	08 –
01 – Amer, Can, Brit	05 – Other Arab	09 – Other
02 – Egyptian	06 – Ind, Pak	
03 – Leb, Syr, Pal	07 – African	

MARITAL STATUS AT DX : 2

1 – Single	3 – Separated	5 – Widowed
(2) Married	4 – Divorced	9 – Unknown

RELIGION : 0 1

(01) Muslim	03 – Hindu	06 – Other
02 – Christian	04 – Buddhist	99 – Unknown

ALCOHOL USAGE : 3

1 – Current alcohol usage	(3) Never used alcohol
2 – Past history of alcohol usage	9 – Unknown

FAMILY HISTORY OF CANCER : 1

(1) Family history of cancer	9 – Unknown
2 – No family history of cancer	

SMOKING/CHEWING HISTORY 3

1 – Current smoker cig.	5 – Shamma
2 – Past smoker	6 – Shisha
(3) Patient never smoked	7 – Combo
4 – Ghat	8 – Other
	9 – Unknown

TOTAL PACK YEARS : _ _

INDUSTRY : _____

OCCUPATION : Teacher

DATE ADMITTED: (mm/dd/yyyy) 0 1 / 2 0 / 1 9 8 7

DATE DISCHARGED: (mm/dd/yyyy) 0 2 / 1 5 / 1 9 8 7

REPORTING SOURCE : 1

(1) Inpatient	4 – Physician's office	7 – Death Cert.
2 – Clinic/outpatient	5 – Nursing home	9 – Unknown
3 – Laboratory	6 – Autopsy	

HOSPITAL REFERRED FROM : 0 0 0 0 1 0 1

Riyadh Central Hospital

HOSPITAL REFERRED TO _____

Form 910-1) (Rev. 9-10)

FIGURE 1-B

PF 12 TTXT – MISCELLANEOUS TEXT

PHYSICAL EXAM: 6-mo hx 2 cm mass rt breast UOQ, mobile, no skin changes. 3x4 cm rt axillary LN. Lt breast NED.

X RAYS / SCANS: 01/20/87 Bilat Mammogram – 2x2.5x2.5 cm mass rt breast UOQ. CXR, Bone Scan, U/S Abdomen – NED

SCOPES / LAB: 01/25/87 ERA (+), PRA (+)

OPERATIVES FINDINGS: 01/25/87 Rt Mod Rad Mastectomy – no description of tumor.

PATHOLOGY / AUTOPSY: 87SP3286 01/25/87 Duct Cell Ca, gr 3; 11/19 LN's. (tumor size: 2.2x2x1.8 cm completely excised) Nipple & overlying skin NED. (largest LN 1.5 cm)

PF 13 TCAN – CANCER IDENTIFICATION

DATE OF INITIAL DIAGNOSIS: (mm/dd/yyyy) 01/25/1987

CLASS OF CASE: 1

0 - Dx here, rx elsewhere
(1) Dx & rx here
2 - Rx here
3 - Rx elsewhere
4 - Rx here prior
5 - Dx at autopsy
9 - Unknown

PRIMARY SITE – TEXT: Breast, Right UOQ

CODE: 1741

HISTOLOGY – TEXT: Duct Cell Carcinoma, gr 3

CODE: 8500/3

TCAN – Cancer Identification (Continued)

GRADE: 3

1 - Well differentiated (I)
2 - Mod well differentiated (II)
(3) Poorly differentiated (III)
4 - Undifferentiated (IV)
5 - T-cell
6 - B cell
7 - Null cell
9 - Not stated, unknown

LATERALITY: 1

0 - Not paired organ
(1) Right
2 - Left
3 - Rt or lt unspecified
4 - Both, simultaneous
9 - Unknown laterality

DX CONFIRMATION: 1

(1) Positive histology
2 - Cytology
4 - Pos. micro, confirm. NOS
5 - Laboratory test/marker
6 - Direct visualization
7 - Radiography
8 - Clinical
9 - Unknown

REGIONAL NODES EXAMINED: 19

00 - No nodes examined
01 - One node examined
...
97 - 97 + nodes examined
98 - Nodes examined, number unknown
99 - Unknown if nodes examined

REGIONAL NODES POSITIVE: 11

00 - No nodes positive
01 - One node positive
...
96 - 96 + nodes positive
97 - Positive nodes, number unknown
98 - No nodes examined
99 - Unknown if any nodes +/-

TUMOR SIZE (cm) 022

eg, 000 - No mass, 002 - 0.2 cm, 055 - 5.5 cm, 999 - Unknown

RESIDUAL TUMOR: 0

(0) None
1 - Microscopic
2 - Macroscopic
8 - No resection, NA
9 - Unknown

DISTANT METS: 1: 2: 3:

0 - Bone Mar.
1 - Peritoneum
2 - Lung
3 - Pleura
4 - Liver
5 - Bone
6 - CNS
7 - Skin
8 - Lymph node (distant)
9 - Unknown/other

GENERAL SUMMARY STAGE: 3

0 - In situ
1 - Localized
2 - Regional, direct extension
(3) Regional, nodes
4 - Regional, both 2 & 3
5 - Regional, NOS
7 - Distant
9 - Unknown/unstageable

AJCC STAGE:

CLINICAL T 2 * N 1 * M 0 * STAGE GROUP 2B **

PATHOLOGICAL T 2 * N 1B * M 0 * STAGE GROUP 2B **

OTHER *** T * N * M * STAGE GROUP **

*TNM Codes – (use alpha codes as appropriate; eg, 12A 2A, 12 2, N1B-1B, M0-0, IS-In situ, X-Unknown)

**AJCC Stage Group – use alpha codes as appropriate; eg, 3A Stage IIIA, 1 Stage I

0 - In situ
1 - Stage I
2 - Stage II
3 - Stage III
4 - Stage IV
9 - Unknown

***Other Basis: (S-Surgical), A-Autopsy, (I) Clinical

FIGURE 1-C

PF 14 TRX1 – 1ST COURSE TREATMENT (SURGERY, RADIATION)

SURGERY

REASON : |0|

(0) Can directed surg performed
1 - Not recommended
2 - Contraindicated, other
6 - Reason unknown, no surg
7 - Patient/guardian refused
8 - Recommended, unk if done
9 - unknown

SUMMARY : (Entire 1st course)* |5|0|

AT THIS HOSPITAL : * |5|0|

* Refer to Appendix A in ConSur User Manual for site specific codes.

STARTED : (mm/dd/yyyy) |0|1|/|2|5|/|1|9|8|7|

TEXT : Rt Mod Rad Mastectomy w/ Rt Axillary Dissection

RADIATION

SUMMARY :

AT THIS HOSPITAL |1|

0 - No Radiation therapy
(1) Beam radiation
2 - Radioactive implants
3 - Radioisotopes
4 - Comb 1 + 2 or 3
5 - Radiation therapy, NOS
7 - Patient/guardian refused
8 - Recommended, unk if done
9 - Unknown

STARTED : (mm/dd/yyyy) |0|8|/|2|9|/|1|9|8|7|

TO BRAIN & CNS : (Lung & leukemia cases only) |9|

0 - None to CNS
1 - Radiation therapy
7 - Patient/guardian refused
8 - Recommended, unk if done
(9) Unknown/not applicable

RADIATION/SURGERY SEQ: |3|

0 - Not applicable
2 - Radiation before surgery
(3) Radiation after surgery
4 - Before & after surgery
5 - Intraoperative radiation
6 - Intraoperative plus 2, 3 or 4
9 - Sequence unknown

TEXT : Chest Wall 6000

PF 16 TRX3 – 1st COURSE TREATMENT (CHEMO, HORMONES, BRM, OTHER)

CHEMOTHERAPY

SUMMARY : |3|

AT THIS HOSPITAL : |3|

0 - No chemotherapy
1 - Chemotherapy, NOS
2 - Chemotherapy, single agent
(3) Chemotherapy, multi-agent combination
7 - Patient/guardian refused
8 - Recommended, unk if done
9 - Unknown

STARTED : (mm/dd/yyyy) |0|2|/|1|3|/|1|9|8|7|

TEXT : 5-FU, Adria, Ctx

HORMONE/STEROIDS

SUMMARY : |1|

AT THIS HOSPITAL : |1|

0 - No hormonal therapy
(1) Hormonal therapy
2 - Endocrine surg/radiation
3 - Hormones + endcr surg/rad
7 - Patient/guardian refused
8 - Recommended, unk if done
9 - Unknown

STARTED : (mm/dd/yyyy) |0|2|/|0|9|/|1|9|8|7|

TEXT : Tamoxifen

BIO-RESPONSE MODIFIER (BRM)

SUMMARY : |0|

AT THIS HOSPITAL : |0|

(0) No BRM
1 - BRM
2 - Allo BMT
3 - Auto BMT
7 - Patient/guardian refused
8 - Recommended, unk if done
9 - Unknown

STARTED : (mm/dd/yyyy) | | |/| | |/| | | | |

TEXT :

OTHER RX

SUMMARY : |0|

AT THIS HOSPITAL : |0|

(0) No other ca-directed rx
1 - Other ca-directed rx
2 - Experimental ca rx
3 - Double-blind study
6 - Unproven therapy
7 - Patient/guardian refused
8 - Recommended, unk if done
9 - Unknown

STARTED : (mm/dd/yyyy) | | |/| | |/| | | | |

TEXT :

PF 18 TRX2 – SUB. THERAPY

	Started mm/dd/yyyy	Course	Type	Code	Desc.
1.	| | |/| | |/| | | |	| |	| |	| |	
2.	| | |/| | |/| | | |	| |	| |	| |	
3	| | |/| | |/| | | |	| |	| |	| |	

FIGURE 1-D

PF 17 TFU1 – FOLLOW-UP INFORMATION

LAST CONTACT/DEATH: (mm/dd/yyyy) 11/01/17/11/9/8/9

CAUSE OF DEATH ICD CODE :

CURRENT VITAL STATUS: (1) Alive 2 Dead 1

CURRENT CANCER STATUS: 2

1 No evidence of cancer (2) Evidence of cancer 9 – Unknown

QUALITY OF SURVIVAL: 9

0 – Normal 3 Amb.: 50% 8 – NA, dead

1 – Sym & amb 4 – Bedridden (9) Unknown

2 Amb.: 50%

LETTER FLAGS –

PATIENT: (letter or asterisk, eg., *, A, B, I)

CONTACT (eg. 0 last contact, 3 – third contact)

CURRENTLY FOREIGN RESIDENT:

Y – Yes, foreign resident, leave blank for all others)

CONTACT FREQUENCY: months

(eg., 01 – One month, 03 – 3 months, 12 – Annual follow-up)

SPECIAL CONDITIONS :

PLACE OF DEATH (State or county – Geocode)

RECURRENCE INFORMATION

DATE: (mm/dd/yyyy) 09/10/10/1998/9

TYPE: 3

0 No recurrence (3) Distant recurrence

1 Local recurrence 4 – Never free

2 – Regional recurrence 9 – Unknown

DISTANT METS: 1: 4

0 DLI (4) Liver 8 – Lymph node (distant) 2: 5

1 – Peritoneum (5) Bone 9 – Unknown/Other 3:

2 – Lung 6 – CNS

3 – Pleura 7 – Skin

	LETTER FLAGS	CODE	PHYSICIAN NAME
1. ATTENDING PHYSICIAN:		00112314	Oncologist
2. OTHER PHYSICIAN:		07116718	Rad. Onc
3. OTHER PHYSICIAN:		09212185	Surgeon
4. OTHER PHYSICIAN:			
5. OTHER PHYSICIAN:			
6. OTHER PHYSICIAN:			

LAST SOURCE FU HOSP:

NEXT HOSP FOR FU:

DEATH CERTIFICATE FILE NO:

PF 20 TREM – REMARKS/SPECIAL DATA ITEMS

FREE FORMAT AREA:

REMARKS: Mother died of breast cancer.

OVERRIDE FIELDS (Y – Bypass edit, leave blank if edit not bypassed)

SITE/HIST :

AGE /SITE/HIST :

SEQNO/SITE/HIST :

SPECIAL FIELDS :

1 : Hepatitis

2 : Bilharzia

3 : Burn Scar

4 : Consanguinity

5 : Predisposing Factors

6 : Pregnancy during dx/tx

7 : Renal Transplant

8 : Immunodeficiency Disorder

9 :

10 :

PF – 21 TADR – PATIENT NAME ADDRESS FILE

MAILING NAME :

SALUTATION :

ADDRESS 1 : Riyadh

ADDRESS 2 :

CITY : Riyadh

PROV. RY ZIP CODE:

TELEPHONE: (11)4456778 EXT:

COMMENT:

PATIENT/GUARDIAN CODE: P – Patient G – Guardian

PF – 22 TCON – CONTACT NAME/ADDRESS FILE MAINTENANCE

CONTACT NUMBER : (0 – First contact, 1 – Second, . . . 9 – Tenth)

MAILING NAME : Riyadh Central Hospital

SALUTATION :

ADDRESS 1 : Riyadh

ADDRESS 2 :

CITY : Riyadh

PROV. RY ZIP CODE:

TELEPHONE: ( ) EXT:

COMMENT:

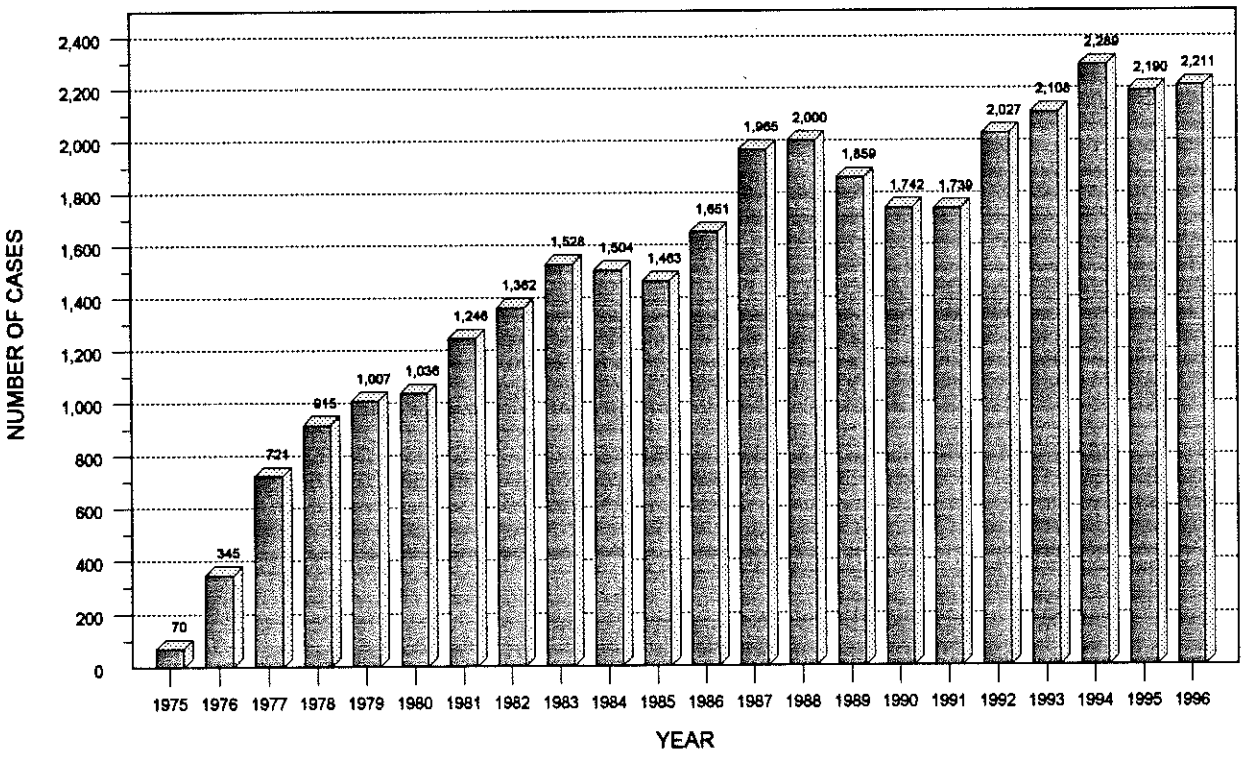
REFER HOSP. MRN : 89856

II. KFSH&RC CANCER PATIENT POPULATION

A total of 2,211 cases were accessioned in 1996, with 1,098 males and 1,113 females or a male/female ratio of 1:1. This represents a 1% increase from 1995.

FIGURE 2

DISTRIBUTION OF ALL CASES ACCESSIONED BY YEAR
1975 - 1996 (TOTAL CASES = 32,980)



From the opening of the hospital (mid 1975) until December 1996, 32,980 cancer cases were registered (17,907 males and 15,073 females) with a male/female ratio of 1.2:1. There were 4,178 (12.7%) pediatric cases (0 to 14 years of age) and 28,802 (87.3%) adults (15 years old and above). A slight difference in the proportion was noted in 1996, 13.3% (295) for pediatrics and 86.7% (1,916) for adults.

TABLE 1

ALL CASES SEEN AT KFSH&RC (MALE/FEMALE & PEDIATRICS/ADULTS) BY 5-YEAR PERIOD 1975 - 1996

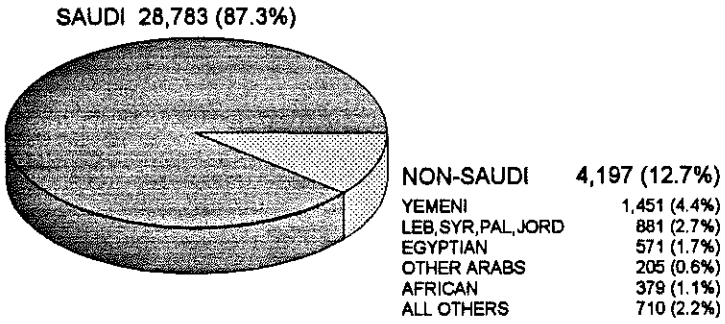
	1975-1976*		1977-1981		1982-1986		1987-1991		1992-1996		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
MALE	280		2,981		4,150		4,969		5,527		17,907	
FEMALE	135		1,945		3,358		4,336		5,299		15,073	
TOTAL	**415**		**4,926**		**7,508**		**9,305**		**10,826**		**32,980**	
M/F RATIO	**2.1:1**		**1.5:1**		**1.2:1**		**1.2:1**		**1.0:1**		**1.2:1**	
PEDIATRICS**	55	13.2	592	12.0	984	13.1	1,159	12.5	1,388	12.8	4,178	12.7
ADULTS	360	86.8	4,334	88.0	6,524	86.9	8,146	87.5	9,438	87.2	28,802	87.3
TOTAL	**415**	**100**	**4,926**	**100**	**7,508**	**100**	**9,305**	**100**	**10,826**	**100**	**32,980**	**100**

* First two years of KFSH&RC partial operation.
** Pediatrics = 0 to 14 years of age; Adults = 15 years and above.

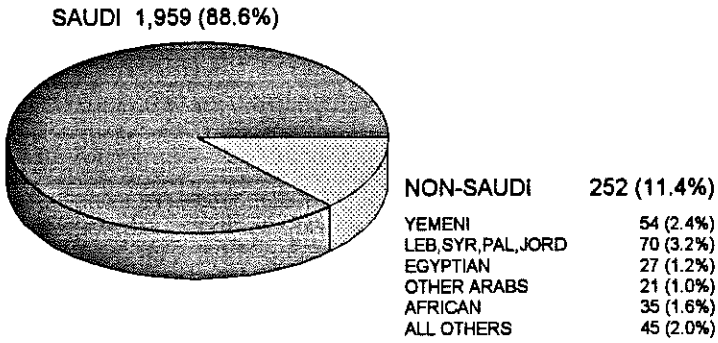
FIGURE 3

DISTRIBUTION OF ALL CASES BY NATIONALITY

1975 - 1996 (TOTAL CASES = 32,980)



1996 CASES (TOTAL = 2,211)



Saudi nationals totaled 1,959 (88.6%) in 1996 and the non-Saudi, 252 (11.4%). During the period 1975 to 1996, the former accounted for 87.3% (28,783) while the latter, 12.7% (4,197).

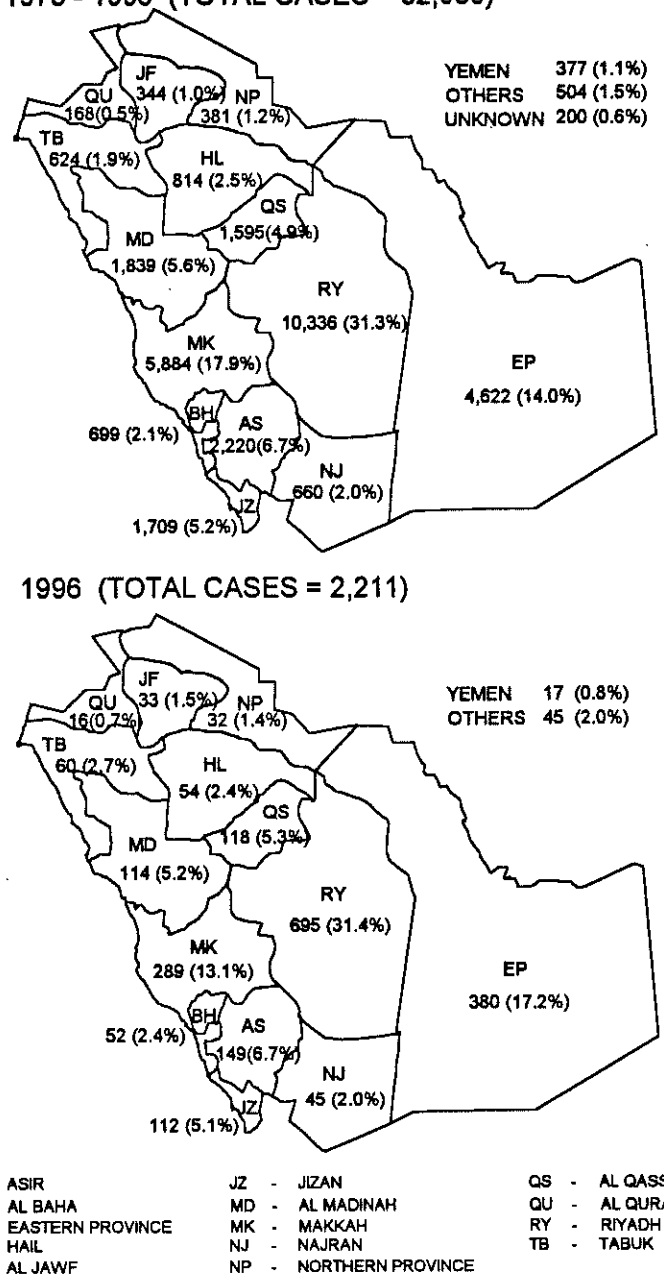
Geographically, the referral pattern in 1996 is mainly from the Riyadh Region with 31.4% of all cases, followed by the Eastern Province and the Makkah Region with 17.2% and 13.1%, respectively. These same regions had the most number of cases during the 22 years in review, i.e., 31.3% from Riyadh, 17.9% from Makkah and 14.0% from the Eastern Province.

These percentages reflect KFSH&RC actual experience rather than adjusted to reflect the population of those regions.

FIGURE 4

DISTRIBUTION OF ALL CASES BY GEOGRAPHIC REGION

(Based on Given Address at the Time of Diagnosis)



AS - ASIR
BH - AL BAHA
EP - EASTERN PROVINCE
HL - HAIL
JF - AL JAWF
JZ - JIZAN
MD - AL MADINAH
MK - MAKKAH
NJ - NAJRAN
NP - NORTHERN PROVINCE
QS - AL QASSIM
QU - AL QURAYYAT
RY - RIYADH
TB - TABUK

TRENDS IN RELATIVE FREQUENCY OF CANCER AT KFSH&RC

The crude relative frequency is the proportion of a given cancer in relation to all cases in a clinical or pathological series. Although such frequencies are subject to many biases, historically many elevated frequencies have been confirmed when complete cancer registration was introduced.

Biases that may have an effect on the relative frequencies of cancer cases at KFSH&RC include:

- possible nonusage of medical services by some of the population so that the hospital population may not reflect the disease state of the community
- resistance to examination by part of the female population
- absence of postmortem examinations/death certificates
- selective referral of certain malignancies because of a specialty service available
- eligibility criteria for admission to KFSH&RC
- age distribution of the population

Breast cancer led the list of total cancer cases seen from 1975 to 1996 with 9.1%, followed by Leukemia (8.4%), Non-Hodgkin's Lymphoma (8.3%), Oral Cavity (5.5%) and Thyroid (5.4%).

FIGURE 5

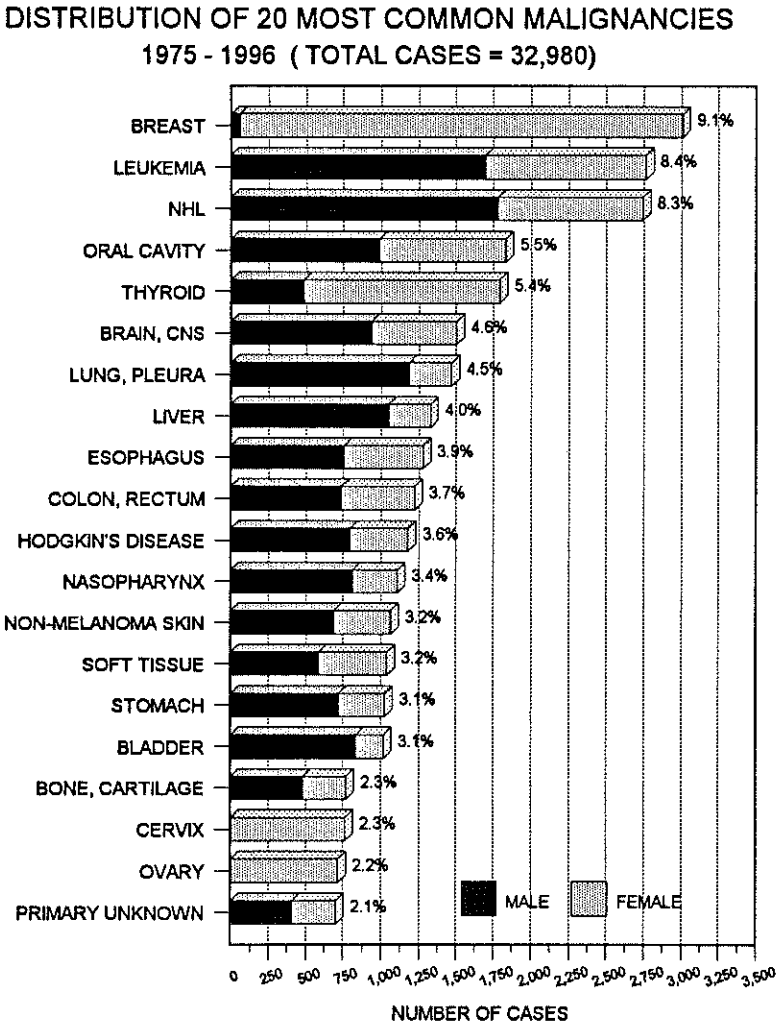


TABLE 2

TEN MOST COMMON MALIGNANCIES BY THE MOST COMMON AGE GROUP AT DIAGNOSIS
1975 - 1996

SITE	AGE GROUP	No.	%
Breast	40 - 49	924	30.7
	30 - 39	798	26.5
	50 - 59	614	20.4
	60 - 69	319	10.6
	20 - 29	215	7.2

SITE	AGE GROUP	No.	%
Brain, CNS	00 - 09	504	33.5
	10 19	297	19.8
	20 - 29	168	11.2
	30 - 39	147	9.8
	50 - 59	145	9.6

SITE	AGE GROUP	No.	%
Leukemia	00 - 09	865	31.3
	10 19	509	18.4
	20 - 29	331	12.0
	30 - 39	328	11.9
	40 - 49	243	8.8

SITE	AGE GROUP	No.	%
Lung, Pleura	60 - 69	498	33.9
	50 - 59	371	25.2
	70 - 79	245	16.7
	40 - 49	203	13.8
	30 - 39	73	5.0

SITE	AGE GROUP	No.	%
Non-Hodgkin's Lymphoma	60 - 69	454	16.6
	50 - 59	430	15.7
	40 - 49	341	12.4
	30 - 39	280	10.2
	70 - 79	278	10.1

SITE	AGE GROUP	No.	%
Liver	60 - 69	420	31.6
	50 - 59	364	27.4
	70 - 79	204	15.4
	40 - 49	174	13.1
	30 - 39	62	4.7

SITE	AGE GROUP	No.	%
Oral Cavity	60 - 69	461	25.2
	50 - 59	420	23.0
	70 - 79	311	17.0
	40 - 49	236	12.9
	30 - 39	146	8.0

SITE	AGE GROUP	No.	%
Esophagus	60 - 69	406	31.8
	50 - 59	283	22.1
	70 - 79	272	21.3
	40 - 49	131	10.2
	80 - 89	96	7.5

SITE	AGE GROUP	No.	%
Thyroid	30 - 39	409	22.8
	20 - 29	356	20.0
	40 - 49	316	17.6
	50 - 59	263	14.7
	60 - 69	200	11.2

SITE	AGE GROUP	No.	%
Colon, Rectum	50 - 59	288	23.6
	60 - 69	267	21.9
	40 - 49	201	16.5
	30 - 39	169	13.8
	70 - 79	150	12.3

Cancer among pediatrics (under the age of 15) accounted for 12.7% of all cases from 1975 to 1996. The five most common pediatric malignancies were Leukemia (26.6%), Lymphoma (20.0%)[NHL 11.8% and HD 8.2%], Brain/CNS (16.3%), Soft Tissue (8.3%) and Eye (7.2%).

FIGURE 6

DISTRIBUTION OF 10 MOST COMMON PEDIATRIC MALIGNANCIES
1975 - 1996 (TOTAL CASES = 4,178)

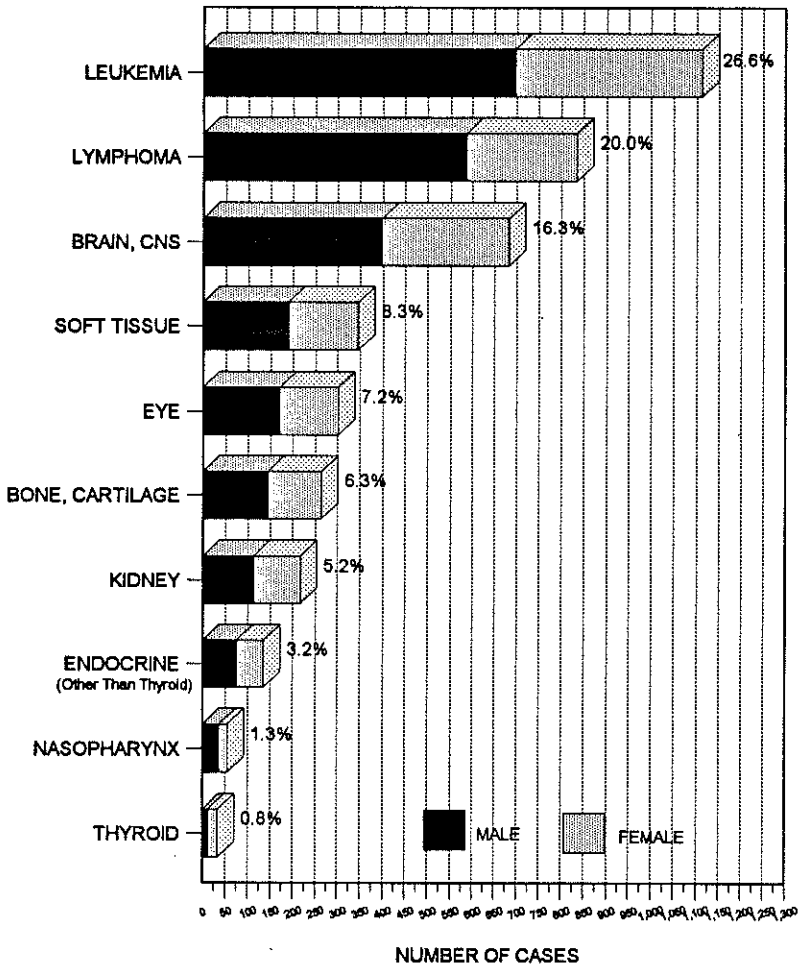


FIGURE 7

DISTRIBUTION OF 10 MOST COMMON PEDIATRIC MALIGNANCIES
BY HISTOLOGY, 1975-1996 (TOTAL CASES = 4,178)

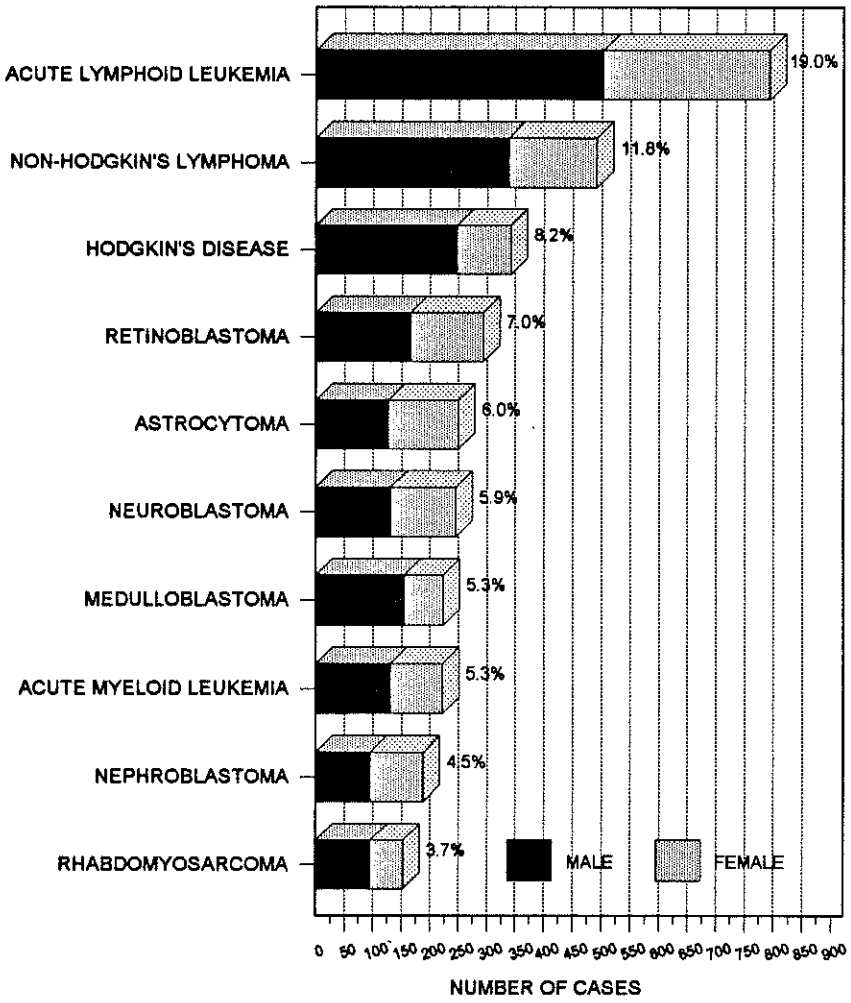


TABLE 3

ALL CASES SEEN AT KFSH&RC BY SITE* AND YEAR

1975 - 1996

SITE	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	TOTAL
Oral Cavity	1	14	33	79	69	71	58	80	101	76	103	76	95	129	104	103	103	112	98	97	121	105	1,828
Nasopharynx	3	11	38	34	37	35	48	46	65	46	45	49	80	65	62	62	62	53	59	58	62	85	1,105
Esophagus	1	15	51	62	67	67	57	62	77	78	57	69	76	66	68	72	66	68	47	50	50	52	1,278
Stomach	2	15	32	35	50	37	50	50	64	59	48	63	60	47	51	51	36	47	42	68	61	57	1,025
Colon, Rectum	1	13	22	24	31	38	51	39	43	59	45	51	70	82	61	64	80	88	83	93	89	94	1,221
Liver	7	15	33	44	49	33	41	54	53	65	56	84	78	71	68	55	66	75	82	103	101	95	1,328
Pancreas	1	5	7	11	15	14	20	22	14	20	16	27	20	16	27	12	13	26	21	22	25	20	374
Other G.I.	2	5	10	11	11	14	11	11	11	13	16	22	26	22	20	20	13	29	31	32	21	26	377
Larynx	1	5	12	12	12	14	20	13	23	22	25	16	24	33	21	26	34	27	31	35	38	36	480
Lung, Pleura	3	11	24	34	45	39	56	62	75	74	86	84	83	108	91	75	84	82	89	92	87	86	1,470
Multiple Myeloma	0	5	6	11	7	9	7	13	9	12	14	12	24	20	29	13	24	24	23	32	24	20	338
Lymphoid Leukemia	4	14	15	38	32	38	53	69	66	48	59	84	92	77	75	55	74	79	89	71	85	90	1,307
Myeloid Leukemia	3	13	22	44	50	37	62	50	40	69	56	72	86	71	72	70	71	60	93	82	111	70	1,304
Other Leukemias	0	1	3	5	8	8	6	6	11	10	6	3	7	9	9	7	13	5	10	14	8	5	154
Reticuloendothelium	0	1	0	1	1	1	1	1	1	1	1	6	2	1	1	1	0	0	0	2	0	0	22
Bone, Cartilage	1	6	13	25	21	20	24	42	35	40	23	32	40	46	45	37	41	52	55	60	56	57	771
Soft Tissue	1	14	28	30	33	29	35	41	34	40	43	52	56	50	65	68	76	52	54	84	92	62	1,039
Skin Melanoma	0	4	4	8	8	6	7	4	11	12	7	7	12	15	3	5	9	15	7	7	6	8	165
Non-Melanoma Skin Ca	2	14	27	32	48	40	49	57	56	56	67	70	47	48	61	46	53	60	54	64	48	65	1,064
Breast	3	24	53	46	57	65	101	111	111	153	131	127	174	194	137	168	168	187	250	241	229	277	3,007
Uterus, Genital	1	2	12	12	13	11	17	16	35	22	21	28	36	37	34	34	33	41	36	54	38	32	565
Cervix	0	10	18	18	25	18	26	25	33	32	41	54	51	50	33	44	35	52	50	52	49	47	763
Ovary	2	6	10	10	17	21	20	35	31	28	24	35	43	49	53	46	37	45	55	50	54	54	725
Prostate	0	7	5	4	5	10	11	18	28	19	19	17	22	27	27	24	16	40	26	45	36	49	455
Testis, Genital	0	4	10	8	13	11	18	13	11	16	17	14	20	19	13	19	16	22	28	25	14	15	326
Bladder	4	7	12	24	29	39	37	23	42	36	45	51	79	74	73	59	44	65	87	71	60	55	1,016
Kidney, Urinary	0	9	18	18	18	15	18	30	23	21	25	42	34	59	33	34	35	53	51	65	49	48	698
Eye	0	6	11	19	12	24	29	34	25	17	30	24	35	42	26	30	9	16	39	25	14	22	489
Brain, CNS	3	24	27	40	26	31	31	77	53	58	49	71	88	92	98	81	84	112	88	117	126	127	1,503
Thyroid	2	8	17	28	33	44	57	51	66	71	63	82	119	112	110	93	110	141	134	157	132	160	1,790
Other Endocrine	1	1	2	2	2	9	9	7	12	8	17	10	10	13	2	6	8	14	11	10	8	11	173
NHL - Lymph Nodes	4	19	62	69	97	93	97	91	119	105	88	85	95	99	93	92	70	89	79	79	68	81	1,774
NHL - Extra-nodal	0	4	11	6	7	19	32	25	53	35	36	57	62	54	73	62	52	61	75	79	91	74	968
Hodgkin's Disease-LNs	13	19	40	41	36	42	47	42	53	50	49	44	65	57	74	56	56	72	71	77	88	75	1,167
HD - Extra-nodal	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	3	2	2	0	0	10
Primary Unknown	3	11	23	24	20	27	33	30	33	25	26	24	36	32	42	40	40	51	42	61	36	41	700
All Other Sites	1	3	10	6	4	7	7	12	10	8	9	6	18	14	4	12	8	10	16	13	13	10	201
TOTAL	70	345	721	915	1008	1036	1246	1362	1528	1504	1463	1651	1965	2000	1859	1742	1739	2028	2108	2289	2190	2211	32,980

* Includes Multiple Primary Neoplasms.

TABLE 4

ALL CASES SEEN AT KFSH&RC BY SITE* AND 5-YEAR PERIOD

1975 - 1996

SITE	1975-1976**		1977-1981		1982-1986		1987-1991		1992-1996		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
Oral Cavity	15	3.6%	310	6.3%	436	5.8%	534	5.7%	533	4.9%	1,828	5.5%
Nasopharynx	14	3.4%	192	3.9%	251	3.3%	331	3.6%	317	2.9%	1,105	3.4%
Esophagus	16	3.9%	304	6.2%	343	4.6%	348	3.7%	267	2.5%	1,278	3.9%
Stomach	17	4.1%	204	4.1%	284	3.8%	245	2.6%	275	2.5%	1,025	3.1%
Colon, Rectum	14	3.4%	166	3.4%	237	3.2%	357	3.8%	447	4.1%	1,221	3.7%
Liver	22	5.3%	200	4.1%	312	4.2%	338	3.6%	456	4.2%	1,328	4.0%
Pancreas	6	1.4%	67	1.4%	99	1.3%	88	0.9%	114	1.1%	374	1.1%
Other G.I.	7	1.7%	57	1.2%	73	1.0%	101	1.1%	139	1.3%	377	1.1%
Larynx	6	1.4%	70	1.4%	99	1.3%	138	1.5%	167	1.5%	480	1.5%
Lung, Pleura	14	3.4%	198	4.0%	381	5.1%	441	4.7%	436	4.0%	1,470	4.5%
Multiple Myeloma	5	1.2%	40	0.8%	60	0.8%	110	1.2%	123	1.1%	338	1.0%
Lymphoid Leukemia	18	4.3%	176	3.6%	326	4.3%	373	4.0%	414	3.8%	1,307	4.0%
Myeloid Leukemia	16	3.9%	215	4.4%	287	3.8%	370	4.0%	416	3.8%	1,304	4.0%
Other Leukemias	1	0.2%	30	0.6%	36	0.5%	45	0.5%	42	0.4%	154	0.5%
Reticuloendothelium	1	0.2%	4	0.1%	10	0.1%	5	0.1%	2	0.0%	22	0.1%
Bone, Cartilage	7	1.7%	103	2.1%	172	2.3%	209	2.2%	280	2.6%	771	2.3%
Soft Tissue	15	3.6%	155	3.1%	210	2.8%	315	3.4%	344	3.2%	1,039	3.2%
Skin Melanoma	4	1.0%	33	0.7%	41	0.5%	44	0.5%	43	0.4%	165	0.5%
Non-Melanoma Skin Ca	16	3.9%	196	4.0%	306	4.1%	255	2.7%	291	2.7%	1,064	3.2%
Breast	27	6.5%	322	6.5%	633	8.4%	841	9.0%	1184	10.9%	3,007	9.1%
Uterus, Genital	3	0.7%	65	1.3%	124	1.7%	177	1.9%	205	1.9%	574	1.7%
Cervix	10	2.4%	105	2.1%	185	2.5%	213	2.3%	250	2.3%	763	2.3%
Ovary	8	1.9%	78	1.6%	151	2.0%	225	2.4%	254	2.3%	716	2.2%
Prostate	7	1.7%	35	0.7%	101	1.3%	116	1.2%	196	1.8%	455	1.4%
Testis, Genital	4	1.0%	60	1.2%	71	0.9%	87	0.9%	104	1.0%	326	1.0%
Bladder	11	2.7%	141	2.9%	197	2.6%	329	3.5%	338	3.1%	1,016	3.1%
Kidney, Urinary	9	2.2%	87	1.8%	141	1.9%	195	2.1%	266	2.5%	698	2.1%
Eye	6	1.4%	95	1.9%	130	1.7%	142	1.5%	116	1.1%	489	1.5%
Brain, CNS	27	6.5%	155	3.1%	308	4.1%	443	4.8%	570	5.3%	1,503	4.6%
Thyroid	10	2.4%	179	3.6%	333	4.4%	544	5.8%	724	6.7%	1,790	5.4%
Other Endocrine	2	0.5%	24	0.5%	54	0.7%	39	0.4%	54	0.5%	173	0.5%
NHL - Lymph Nodes	23	5.5%	418	8.5%	488	6.5%	449	4.8%	396	3.7%	1,774	5.4%
NHL - Extra-nodal	4	1.0%	75	1.5%	206	2.7%	303	3.3%	380	3.5%	968	2.9%
Hodgkin's Disease-LNs	32	7.7%	206	4.2%	238	3.2%	308	3.3%	383	3.5%	1,167	3.5%
HD - Extra-nodal	0	0.0%	0	0.0%	2	0.0%	1	0.0%	7	0.1%	10	0.0%
Primary Unknown	14	3.4%	127	2.6%	138	1.8%	190	2.0%	231	2.1%	700	2.1%
All Other Sites	4	1.0%	34	0.7%	45	0.6%	56	0.6%	62	0.6%	201	0.6%
TOTAL	415	100.0%	4,926	100.0%	7,508	100.0%	9,305	100.0%	10,826	100.0%	32,980	100.0%

* Includes Multiple Primary Neoplasms.

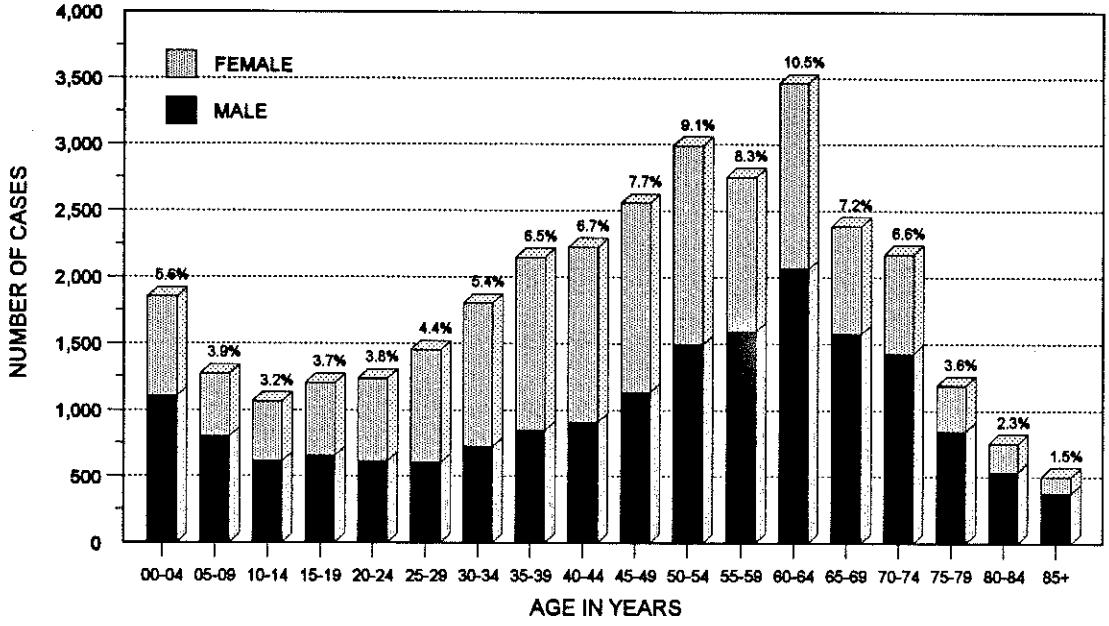
** First Two Years of KFSH&RC Partial Operation.

The largest number of cases was noted in the 5th and 6th decades in males and in the 4th and 5th in females. In 1996, the mean age was 45.3, the median was 48.2 and the mode was 60. Pediatric malignancies are most common among children three years of age.

FIGURE 8

DISTRIBUTION OF ALL CASES BY AGE AT DIAGNOSIS

1975 - 1996 (TOTAL CASES = 32,980)



1996 (TOTAL CASES = 2,211)

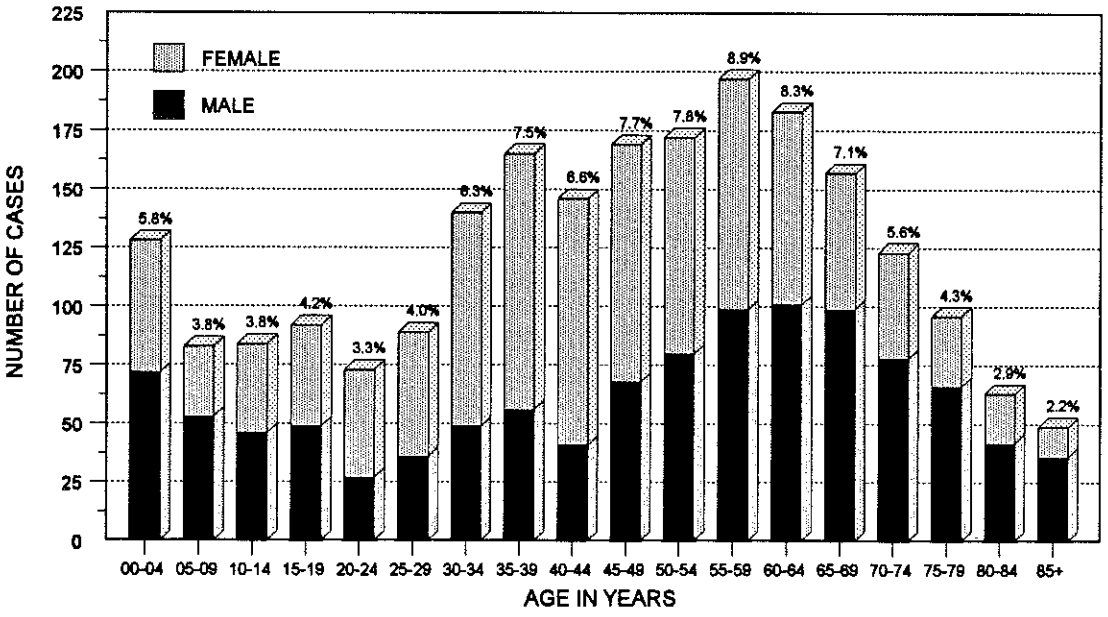
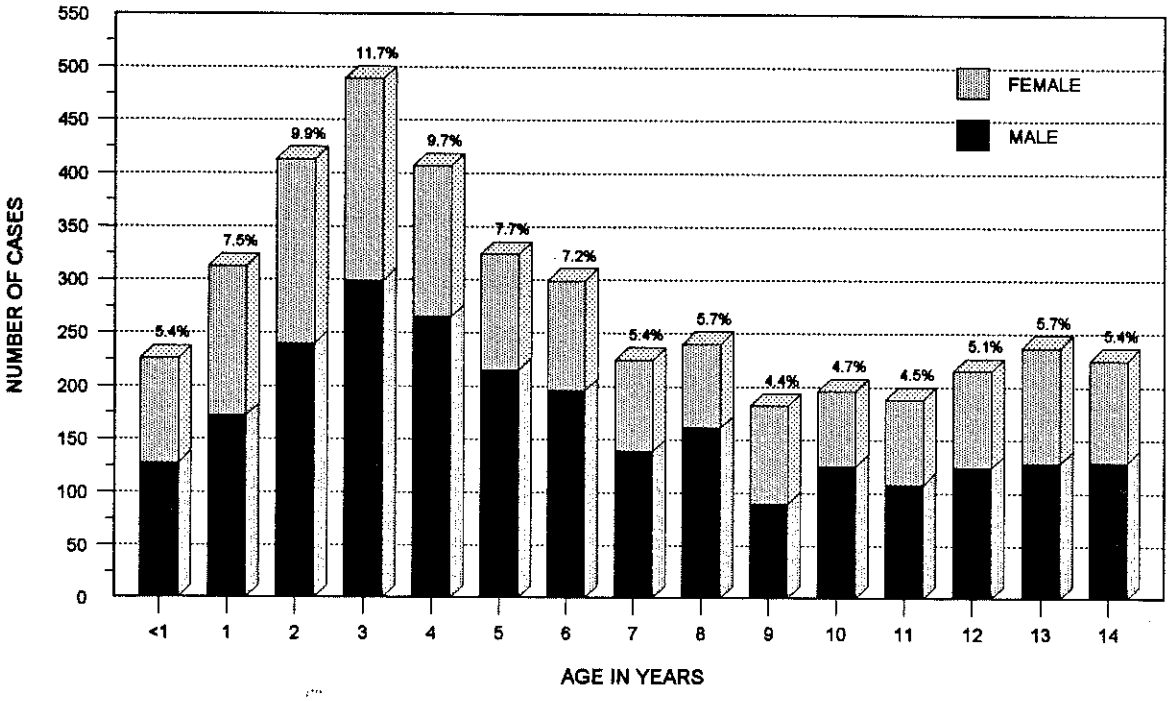


FIGURE 9

DISTRIBUTION OF ALL PEDIATRIC CASES BY AGE AT DIAGNOSIS
1975 - 1996 (TOTAL CASES = 4,178)



Of the 2,211 cases in 1996, 1,921 (86.9%) were **analytic** (defined as cases which were first diagnosed and/or received all or part of their first course of treatment at KFSH&RC. The remaining 290 cases (13.1%) were **non-analytic** (defined as cases diagnosed elsewhere and received all of their first course of treatment elsewhere). Out of the 1,921 analytic cases, pediatric cases totaled 257, with 149 males and 108 females.

See Table 5 for the distribution of cases by site, sex, class of case, and stage at diagnosis and Tables 6, 7 and 8 for the distributions of analytic cases by site, sex and age at diagnosis.

TABLE 5

ALL CASES SEEN AT KFSH&RC BY SITE*, SEX, CLASS OF CASE AND SUMMARY STAGE

1996

SITE	TOTAL		SEX		CLASS OF CASE**		ANALYTIC CASES GENERAL SUMMARY STAGE				
	Number	%	Male	Female	Analytic	Non-Anal	In Situ	Localized	Regional	Distant	Unstageable
Breast	277	12.5%	2	275	230	47	5	63	125	36	1
Leukemia	165	7.5%	92	73	144	21	0	0	0	144	0
Thyroid	160	7.2%	46	114	135	25	0	58	63	12	2
Non-Hodgkin's Lymphoma	155	7.0%	98	57	134	21	0	38	25	71	0
Brain, CNS	127	5.7%	81	46	122	5	0	84	33	3	2
Oral Cavity	105	4.8%	50	55	97	8	0	20	63	14	0
Liver	95	4.3%	72	23	89	6	0	17	18	50	4
Colon, Rectum	94	4.3%	52	42	80	14	0	15	39	25	1
Lung, Pleura	86	3.9%	70	16	80	6	0	7	40	33	0
Nasopharynx	85	3.8%	59	26	79	6	0	2	49	26	2
Hodgkin's Disease	75	3.4%	48	27	71	4	0	9	30	32	0
Non-Melanoma Skin Ca	65	2.9%	39	26	49	16	0	32	6	11	0
Soft Tissue	62	2.8%	33	29	48	14	0	27	16	5	0
Stomach	57	2.6%	37	20	51	6	0	7	30	13	1
Bone, Cartilage	57	2.6%	35	22	52	5	0	5	33	14	0
Bladder	55	2.5%	47	8	46	9	0	22	16	7	1
Ovary	54	2.4%	0	54	39	15	0	12	2	24	1
Esophagus	52	2.4%	25	27	47	5	0	16	18	13	0
Prostate	49	2.2%	49	0	39	10	0	10	7	21	1
Kidney, Urinary	48	2.2%	27	21	39	9	0	15	9	15	0
Cervix	47	2.1%	0	47	42	5	2	3	30	7	0
Primary Unknown	41	1.9%	22	19	39	2	0	0	0	0	39
Larynx	36	1.6%	33	3	34	2	0	13	17	4	0
Uterus, Genital	32	1.4%	0	32	26	6	0	17	6	3	0
Other G.I.	26	1.2%	11	15	18	8	0	7	7	4	0
Eye	22	1.0%	12	10	16	6	1	4	10	1	0
Pancreas	20	0.9%	12	8	16	4	0	1	9	6	0
Multiple Myeloma	20	0.9%	12	8	19	1	0	0	0	19	0
Testis, Genital	15	0.7%	15	0	13	2	0	9	1	3	0
Other Endocrine	11	0.5%	9	2	11	0	0	4	4	3	0
All Other Sites	10	0.5%	7	3	10	0	0	0	6	4	0
Skin Melanoma	8	0.4%	3	5	6	2	0	2	2	2	0
TOTAL	2,211	100.0%	1,098	1,113	1,921	290	8	519	714	625	55

* Includes Multiple Primary Neoplasms.

** Analytic Cases - cases which were first diagnosed and/or received all or part of their first course of treatment at KFSH&RC.
Non-Analytic Cases - cases which were diagnosed elsewhere and received all of their first course of treatment elsewhere.

TABLE 6

ANALYTIC CASES SEEN AT KFSH&RC BY SITE* AND AGE

1 9 9 6

SITE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
Oral Cavity	0	0	1	2	3	2	5	5	4	6	12	11	8	10	12	10	4	2	97
Nasopharynx	2	0	2	6	3	1	8	3	8	13	8	11	7	5	0	1	0	1	79
Esophagus	0	0	0	0	0	2	1	3	2	2	4	4	6	6	3	8	4	2	47
Stomach	0	0	0	0	0	0	3	0	1	1	4	10	10	6	5	6	3	2	51
Colon, Rectum	0	0	0	2	2	6	2	4	8	8	7	7	11	5	7	5	4	2	80
Liver	0	2	0	0	0	0	0	4	2	4	4	16	14	11	15	11	3	3	89
Pancreas	0	0	0	0	0	0	1	1	1	3	3	1	1	1	2	1	0	1	16
Other G.I.	0	0	0	0	0	0	0	1	3	2	3	1	2	3	2	0	1	0	18
Larynx	0	0	0	0	0	0	0	0	2	2	4	6	2	7	5	1	3	2	34
Lung, Pleura	0	0	0	0	0	0	0	2	3	6	10	14	10	13	6	6	6	4	80
Multiple Myeloma	0	0	0	0	1	0	1	3	0	1	2	3	3	1	1	2	0	1	19
Lymphoid Leukemia	34	9	13	8	4	2	1	2	0	0	0	0	1	0	0	2	0	1	77
Myeloid Leukemia	7	7	1	7	6	5	7	10	6	0	2	1	2	0	0	0	1	0	62
Other Leukemias	1	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	5
Bone, Cartilage	2	5	14	13	7	2	2	2	0	0	1	1	2	0	0	0	1	0	52
Soft Tissue	8	1	4	3	3	2	4	5	1	9	3	3	0	1	1	0	0	0	48
Skin Melanoma	0	0	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	6
Non-Melanoma Skin Ca	0	1	1	2	0	2	3	5	4	5	2	3	6	5	4	1	2	3	49
Breast	0	0	0	1	1	11	22	42	37	36	21	25	17	9	3	1	2	2	230
Uterus, Genital	0	0	1	0	1	0	1	2	2	0	1	7	2	3	3	1	1	1	26
Cervix	0	0	0	0	0	2	4	3	7	7	8	1	4	1	2	0	2	1	42
Ovary	0	1	2	3	4	3	2	3	4	3	3	4	1	3	2	1	0	0	39
Prostate	0	0	0	0	0	0	0	0	0	1	2	1	3	5	7	7	7	6	39
Testis, Genital	1	0	0	0	3	3	2	1	2	0	0	0	0	0	0	1	0	0	13
Bladder	1	0	0	0	0	1	0	2	2	2	7	4	2	6	5	6	3	5	46
Kidney, Urinary	9	2	0	0	0	1	0	0	4	2	1	5	5	5	3	2	0	0	39
Eye	13	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	16
Brain, CNS	21	27	13	5	4	4	6	4	3	6	7	8	6	7	0	1	0	0	122
Thyroid	0	0	2	6	13	19	18	20	10	10	7	11	6	6	2	1	2	2	135
Other Endocrine	6	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	11
NHL - Lymph Nodes	4	1	1	5	1	1	3	1	3	4	9	4	14	5	3	6	4	1	70
NHL - Extra-nodal	3	3	2	1	1	2	4	1	3	7	9	6	3	10	3	4	1	1	64
Hodgkin's Disease-LNs	2	10	10	15	6	4	7	4	0	5	1	1	4	0	0	1	0	1	71
HD - Extra-nodal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Primary Unknown	0	1	0	0	0	1	1	5	2	3	4	3	5	5	4	2	2	1	39
All Other Sites	0	0	0	1	1	1	0	0	0	0	2	1	0	2	1	1	0	0	10
TOTAL	114	72	71	81	64	80	110	140	125	149	152	173	158	141	101	89	56	45	1,921

* Includes Multiple Primary Neoplasms.

TABLE 7

ANALYTIC MALE CASES SEEN AT KFSH&RC BY SITE* AND AGE

1 9 9 6

SITE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
Oral Cavity	0	0	0	0	0	0	2	2	0	4	7	5	5	5	9	6	2	0	47
Nasopharynx	0	0	2	1	1	1	4	2	8	10	3	11	6	3	0	1	0	0	53
Esophagus	0	0	0	0	0	1	0	2	0	0	2	0	2	5	1	6	1	2	22
Stomach	0	0	0	0	0	0	1	0	1	0	2	8	7	4	4	3	3	1	34
Colon, Rectum	0	0	0	2	0	4	1	1	2	4	2	6	6	2	5	3	0	1	39
Liver	0	1	0	0	0	0	0	3	1	3	2	12	11	10	11	8	3	3	68
Pancreas	0	0	0	0	0	0	0	1	1	2	2	1	0	0	1	1	0	1	10
Other G.I.	0	0	0	0	0	0	0	0	0	1	3	1	0	1	1	0	1	0	8
Larynx	0	0	0	0	0	0	0	0	1	2	4	5	1	7	5	1	3	2	31
Lung, Pleura	0	0	0	0	0	0	0	2	3	4	8	11	9	11	3	4	6	4	65
Multiple Myeloma	0	0	0	0	1	0	0	2	0	0	2	0	2	1	0	2	0	1	11
Lymphoid Leukemia	19	5	7	6	3	1	1	1	0	0	0	0	1	0	0	1	0	0	45
Myeloid Leukemia	4	4	0	4	3	4	3	4	2	0	1	1	0	0	0	0	1	0	31
Other Leukemias	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
Bone, Cartilage	1	4	6	8	4	2	1	2	0	0	1	0	2	0	0	0	1	0	32
Soft Tissue	3	1	2	2	1	2	3	2	0	5	1	1	0	1	1	0	0	0	25
Skin Melanoma	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Non-Melanoma Skin Ca	0	0	1	1	0	1	2	3	1	2	0	2	5	2	2	1	2	3	28
Breast	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Uterus, Genital	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cervix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ovary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostate	0	0	0	0	0	0	0	0	0	1	2	1	3	5	7	7	7	6	39
Testis, Genital	1	0	0	0	3	3	2	1	2	0	0	0	0	0	0	1	0	0	13
Bladder	1	0	0	0	0	1	0	2	1	2	6	3	2	4	5	5	3	5	40
Kidney, Urinary	4	0	0	0	0	0	0	0	1	0	0	3	4	5	2	2	0	0	21
Eye	8	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	9
Brain, CNS	15	16	7	3	2	2	4	3	3	3	5	7	4	4	0	1	0	0	79
Thyroid	0	0	1	2	2	2	3	7	4	2	2	1	1	4	1	0	0	2	34
Other Endocrine	4	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	9
NHL - Lymph Nodes	3	1	0	1	0	1	2	1	1	3	5	3	9	5	2	3	3	0	43
NHL - Extra-nodal	1	3	2	1	1	2	3	1	3	4	7	2	1	5	2	2	0	1	41
Hodgkin's Disease-LNs	1	8	6	9	1	3	4	2	0	4	1	1	4	0	0	0	0	1	45
HD - Extra-nodal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Primary Unknown	0	1	0	0	0	1	0	2	1	2	2	2	2	3	1	2	2	0	21
All Other Sites	0	0	0	1	1	0	0	0	0	0	1	1	0	1	1	1	0	0	7
TOTAL	66	45	38	42	23	32	37	47	36	60	72	88	87	88	64	61	38	33	957

* Includes Multiple Primary Neoplasms.

TABLE 8

ANALYTIC FEMALE CASES SEEN AT KFSH&RC BY SITE* AND AGE

1 9 9 6

SITE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
Oral Cavity	0	0	1	2	3	2	3	3	4	2	5	6	3	5	3	4	2	2	50
Nasopharynx	2	0	0	5	2	0	4	1	0	3	5	0	1	2	0	0	0	1	26
Esophagus	0	0	0	0	0	1	1	1	2	2	2	4	4	1	2	2	3	0	25
Stomach	0	0	0	0	0	0	2	0	0	1	2	2	3	2	1	3	0	1	17
Colon, Rectum	0	0	0	0	2	2	1	3	6	4	5	1	5	3	2	2	4	1	41
Liver	0	1	0	0	0	0	0	1	1	1	2	4	3	1	4	3	0	0	21
Pancreas	0	0	0	0	0	0	1	0	0	1	1	0	1	1	1	0	0	0	6
Other G.I.	0	0	0	0	0	0	0	1	3	1	0	0	2	2	1	0	0	0	10
Larynx	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	3
Lung, Pleura	0	0	0	0	0	0	0	0	0	2	2	3	1	2	3	2	0	0	15
Multiple Myeloma	0	0	0	0	0	0	1	1	0	1	0	3	1	0	1	0	0	0	8
Lymphoid Leukemia	15	4	6	2	1	1	0	1	0	0	0	0	0	0	0	1	0	1	32
Myeloid Leukemia	3	3	1	3	3	1	4	6	4	0	1	0	2	0	0	0	0	0	31
Other Leukemias	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Bone, Cartilage	1	1	8	5	3	0	1	0	0	0	0	1	0	0	0	0	0	0	20
Soft Tissue	5	0	2	1	2	0	1	3	1	4	2	2	0	0	0	0	0	0	23
Skin Melanoma	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	4
Non-Melanoma Skin Ca	0	1	0	1	0	1	1	2	3	3	2	1	1	3	2	0	0	0	21
Breast	0	0	0	1	1	11	22	42	37	35	21	25	17	9	3	1	2	2	229
Uterus, Genital	0	0	1	0	1	0	1	2	2	0	1	7	2	3	3	1	1	1	26
Cervix	0	0	0	0	0	2	4	3	7	7	8	1	4	1	2	0	2	1	42
Ovary	0	1	2	3	4	3	2	3	4	3	3	4	1	3	2	1	0	0	39
Prostate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Testis, Genital	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bladder	0	0	0	0	0	0	0	0	1	0	1	1	0	2	0	1	0	0	6
Kidney, Urinary	5	2	0	0	0	1	0	0	3	2	1	2	1	0	1	0	0	0	18
Eye	5	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	7
Brain, CNS	6	11	6	2	2	2	2	1	0	3	2	1	2	3	0	0	0	0	43
Thyroid	0	0	1	4	11	17	15	13	6	8	5	10	5	2	1	1	2	0	101
Other Endocrine	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
NHL - Lymph Nodes	1	0	1	4	1	0	1	0	2	1	4	1	5	0	1	3	1	1	27
NHL - Extra-nodal	2	0	0	0	0	0	1	0	0	3	2	4	2	5	1	2	1	0	23
Hodgkin's Disease-LNs	1	2	4	6	5	1	3	2	0	1	0	0	0	0	0	1	0	0	26
HD - Extra-nodal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Primary Unknown	0	0	0	0	0	0	1	3	1	1	2	1	3	2	3	0	0	1	18
All Other Sites	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	3
TOTAL	48	27	33	39	41	48	73	93	89	89	80	85	71	53	37	28	18	12	964

* Includes Multiple Primary Neoplasms.

TRENDS IN RELATIVE FREQUENCY OF CANCER AT KFSH&RC (cont'd)

The relative frequencies of primary cancers seen at KFSH&RC are very different from the Western world. Common tumors of the West (lung, colon, and prostate) are much less frequent here while leukemia and thyroid cancer, among others, are more common. The following 1996 analytic cases exhibit significant differences in trends from those of the West when compared to the data published in *Cancer Facts & Figures - 1996,* by the American Cancer Society:

Breast - The most common malignancy seen at KFSH&RC is breast cancer, comprising 12.0% of all cases, as compared to 13.7% of all neoplasms diagnosed in the U.S.A. It affects mostly women less than the age of 50, while in the U.S.A., those more than 50 years of age are mostly affected. As in the Western countries, it is the number one cancer among women.

Leukemia - Leukemia constitutes 7.5% of all cases seen at KFSH&RC, as compared to about 2% of all neoplasms diagnosed in the U.S.A. The male/female ratio is 1.2:1. It is the second most common type of malignancy seen in males and the third most common in females. It is also the most common malignancy among pediatrics.

Thyroid - 3.6% of all male malignancies in KFSH&RC are thyroid tumors. However, they represent 10.5% of female malignant neoplasms, second to breast cancer. The male/female ratio is 0.3:1. Thyroid cancer accounts for only 1% of all cases in the U.S.A. and 2% of female malignancies.

Non-Hodgkin's Lymphoma - The most striking feature is the unusually high crude relative frequency of non-Hodgkin's lymphoma, accounting for 7.0% of all cases. The male/female ratio is 1.7:1. In the U.S.A., NHL accounts for only about 4% of all cancer.

Brain/CNS - Primary malignant neoplasm of the brain and CNS accounts for 6.4% of all malignancies and ranks second among the most common pediatric malignancies. The male/female ratio is 1.8:1. This is comparatively higher than in the West with only 1.3% of all cases.

Oral Cavity - A high crude relative frequency rate was also noted in cancer of the oral cavity. In Western countries, oral cancer accounts for no more than 3% of all cancers, whereas at KFSH&RC it represents 5.1% of the cases. The male/female ratio is 0.9:1, and 2.1:1 in the West.

Liver - The relative frequency of liver cancer at KFSH&RC (4.6%) is more than three times higher than that of the West (1.5%). The male/female ratio (3.2:1) is also significantly higher than in the West (1.2:1).

Lung - Frequency of lung cancer is much lower than in Western countries, most likely reflecting the much lower levels of smoking and industrial pollution. In the U.S.A., primary lung cancer represents 13.0% of all cancer cases (12.9% in males, and 13.1% in females). At KFSH&RC, 4.2% of all diagnoses are lung cancer; in males it is the fifth most common tumor, constituting 6.8% of male malignancies and 1.6% in females. The male/female ratio is 4.3:1, in the West, 1.3:1.

Colo-Rectal - Markedly less common than in the West, this disease represents only 4.2% of all tumors. In the U.S.A. it constitutes 9.8% of newly diagnosed cancer cases. Dietary factors, particularly lower animal fat intake, may play a role. The male/female ratio at KFSH&RC is 1:1.

Hodgkin's Disease - The incidence of Hodgkin's lymphoma is comparatively more frequent at KFSH&RC than in Western countries. In the U.S.A. it constitutes 0.6% of all cancers, compared to 3.7% at KFSH&RC. The male/female ratio is 1.7:1, in the West, 1.1:1.

Bone - A higher crude relative frequency rate is seen in bone cancer. It constitutes 0.2% of the all cancers in most centers in the West, but is 2.7% of the cases at KFSH&RC. The male/female ratio at KFSH&RC is 1.6:1.

Soft Tissue - KFSH&RC cases show a higher rate of soft tissue malignancies than the U.S.A., with 2.5% against the latter's 0.5% of all cases. The male/female ratio is 1.1:1, in the West, 1.2:1.

Prostate - The observed rate of prostatic cancer in men is much lower than in the West, where it is one of the most common male cancers (constituting 36% of the male malignancies). This is in contrast to the KFSH&RC experience, where prostatic cancer makes up only 4.1% of the male cancer. This is probably due to the population age difference. Prostate cancer is a disease chiefly of old men and the population of Saudi Arabia is, in general, very young.

FIGURE 10

DISTRIBUTION OF 20 MOST COMMON MALIGNANCIES
1996 ANALYTIC CASES (TOTAL CASES = 1,921)

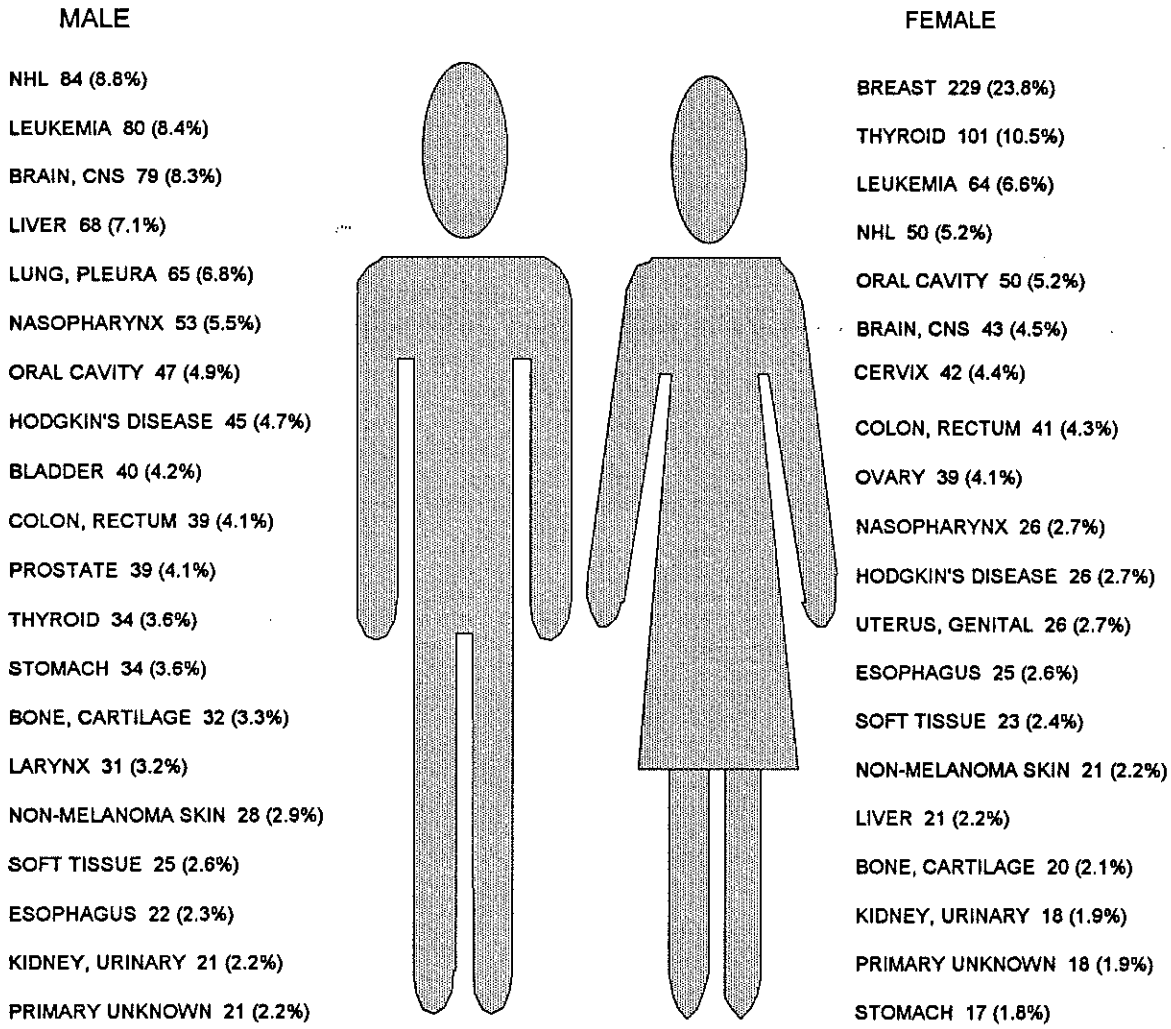
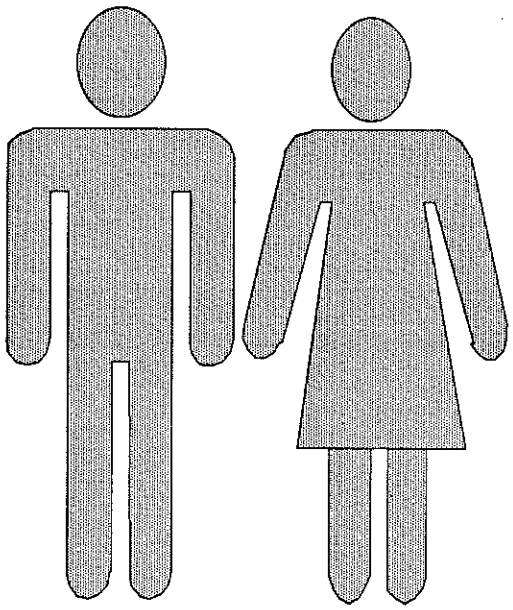


FIGURE 11

DISTRIBUTION OF PEDIATRIC MALIGNANCIES
1996 ANALYTIC CASES (TOTAL CASES = 257)

MALE

LEUKEMIA 41 (27.5%)
BRAIN, CNS 38 (25.5%)
HODGKIN'S DISEASE 15 (10.1%)
BONE, CARTILAGE 11 (7.4%)
NHL 10 (6.7%)
EYE 8 (5.4%)
ENDOCRINE 8 (5.4%) (Other Than Thyroid)
SOFT TISSUE 6 (4.0%)
KIDNEY, URINARY 4 (2.7%)
NASOPHARYNX 2 (1.3%)
LIVER 1 (0.7%)
NON-MELANOMA SKIN 1 (0.7%)
TESTIS, GENITAL 1 (0.7%)
BLADDER 1 (0.7%)
THYROID 1 (0.7%)
PRIMARY UNKNOWN 1 (0.7%)



FEMALE

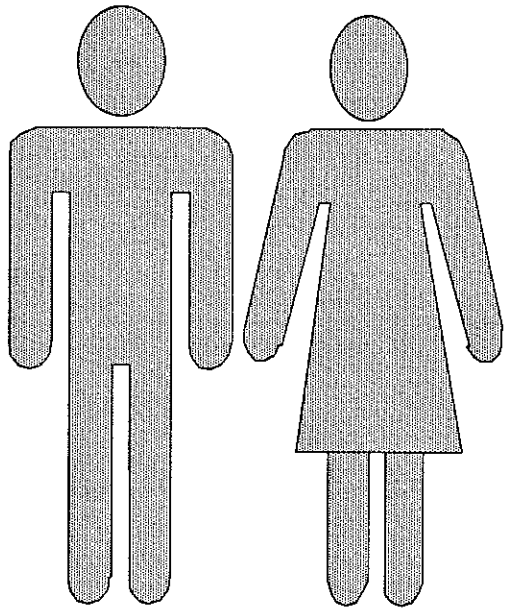
LEUKEMIA 32 (29.6%)
BRAIN, CNS 23 (21.3%)
BONE, CARTILAGE 10 (9.3%)
SOFT TISSUE 7 (6.5%)
KIDNEY, URINARY 7 (6.5%)
HODGKIN'S DISEASE 7 (6.5%)
EYE 6 (5.6%)
NHL 4 (3.7%)
OVARY 3 (2.8%)
NASOPHARYNX 2 (1.9%)
ENDOCRINE 2 (1.9%) (Other Than Thyroid)
UTERUS, GENITAL 1 (0.9%)
THYROID 1 (0.9%)
ORAL CAVITY 1 (0.9%)
NON-MELANOMA SKIN 1 (0.9%)
LIVER 1 (0.9%)

FIGURE 12

DISTRIBUTION OF 10 MOST COMMON PEDIATRIC MALIGNANCIES
BY HISTOLOGY, 1996 ANALYTIC CASES (TOTAL CASES = 257)

MALE

ALL 31 (20.8%)
HODGKIN'S DISEASE 15 (10.1%)
ASTROCYTOMA 13 (8.7%)
MEDULLOBLASTOMA 11 (7.4%)
NHL 10 (6.7%)
EWING'S SARCOMA 8 (5.4%)
RETINOBLASTOMA 7 (4.7%)
GLIOMA, NOS 6 (4.0%)
NEUROBLASTOMA 5 (3.4%)
RHABDOMYOSARCOMA 5 (3.4%)



FEMALE

ALL 25 (23.1%)
HODGKIN'S DISEASE 7 (6.5%)
ASTROCYTOMA 7 (6.5%)
MEDULLOBLASTOMA 6 (5.6%)
RETINOBLASTOMA 6 (5.6%)
NEPHROBLASTOMA 6 (5.6%)
EWING'S SARCOMA 5 (4.6%)
GLIOMA, NOS 5 (4.6%)
AML 5 (4.6%)
OSTEOSARCOMA 5 (4.6%)

TABLE 9

PRIMARY SITE TABLE
(INCLUDES MULTIPLE PRIMARIES)
1 9 9 6

SITE / HISTOLOGY (NOS-Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
		MALE	FEMALE	MALE	FEMALE
	2,211	**927**	**989**	**171**	**124**
LIP	**7**	**5**	**1**	**0**	**1**
Squamous Cell Carcinoma	6	5	1	0	0
Adenosquamous Carcinoma	1	0	0	0	1
TONGUE	**28**	**14**	**14**	**0**	**0**
Squamous Cell Carcinoma	27	14	13	0	0
Adenoid Cystic Carcinoma	1	0	1	0	0
MAJOR SALIVARY GLANDS	**8**	**6**	**2**	**0**	**0**
Adenoid Cystic Carcinoma	2	1	1	0	0
Non-Hodgkin's Lymphoma	2	2	0	0	0
Acinar Cell Carcinoma	1	1	0	0	0
Adenocarcinoma, NOS	1	1	0	0	0
Carcinoma, NOS	1	1	0	0	0
Sarcoma, NOS	1	0	1	0	0
GUM	**17**	**11**	**6**	**0**	**0**
Squamous Cell Carcinoma	16	10	6	0	0
Verrucous Carcinoma	1	1	0	0	0
FLOOR OF MOUTH	**3**	**2**	**1**	**0**	0
Squamous Cell Carcinoma					
OTHER PARTS OF MOUTH	**18**	**5**	**13**	**0**	**0**
Squamous Cell Carcinoma	15	5	10	0	0
Mucoepidermoid Carcinoma	3	0	3	0	0
OROPHARYNX	**9**	**6**	**2**	**1**	**0**
Non-Hodgkin's Lymphoma	7	6	0	1	0
Squamous Cell Carcinoma	2	0	2	0	0
NASOPHARYNX	**89**	**56**	**28**	**3**	**2**
Squamous Cell Carcinoma	31	22	8	1	0
Undifferentiated Carcinoma	30	19	10	1	0
Carcinoma, NOS	22	15	6	1	0
Non-Hodgkin's Lymphoma	4	0	4	0	0
Embryonal Rhabdomyosarcoma	1	0	0	0	1
Malignant Neoplasm, NOS	1	0	0	0	1
HYPOPHARYNX	**24**	**9**	**15**	**0**	**0**
Squamous Cell Carcinoma					

Primary Site Table (cont'd)

SITE	HISTOLOGY (NOS-Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
PHARYNX		**2**	**1**	**1**	**0**	**0**
	Non-Hodgkin's Lymphoma					
ESOPHAGUS		**52**	**25**	**27**	**0**	**0**
	Squamous Cell Carcinoma	49	22	27	0	0
	Adenocarcinoma, NOS	2	2	0	0	0
	Carcinoma, NOS	1	1	0	0	0
STOMACH		**71**	**44**	**27**	**0**	**0**
	Adenocarcinoma, NOS	31	20	11	0	0
	Non-Hodgkin's Lymphoma	14	7	7	0	0
	Signet Ring Cell Carcinoma	8	6	2	0	0
	Adenocarcinoma, Intestinal Type	5	4	1	0	0
	Carcinoma, NOS	4	3	1	0	0
	Squamous Cell Carcinoma	2	1	1	0	0
	Leiomyosarcoma	2	1	1	0	0
	Malignant Neoplasm, NOS	2	0	2	0	0
	Linitis Plastica	1	0	1	0	0
	Mucinous Producing Adenocarcinoma	1	1	0	0	0
	Carcinoma, Diffuse Type	1	1	0	0	0
SMALL INTESTINE		**13**	**6**	**5**	**1**	**1**
	Non-Hodgkin's Lymphoma	7	3	2	1	1
	Adenocarcinoma, NOS	3	2	1	0	0
	Mucinous Adenocarcinoma	1	1	0	0	0
	Carcinoid Tumor	1	0	1	0	0
	Neuroendocrine Carcinoma	1	0	1	0	0
COLON		**37**	**19**	**17**	**1**	**0**
	Adenocarcinoma, NOS	23	11	12	0	0
	Carcinoma, NOS	4	2	2	0	0
	Non-Hodgkin's Lymphoma	3	2	0	1	0
	Mucinous Adenocarcinoma	2	1	1	0	0
	Adenoca in Tubulovillous Adenoma	2	1	1	0	0
	Carcinoid Tumor	1	0	1	0	0
	Signet Ring Cell Carcinoma	1	1	0	0	0
	Adenocarcinoma in Adenomatous Polyp	1	1	0	0	0
RECTUM/RECTOSIGMOID JUNCTION/ANUS		**60**	**35**	**25**	**0**	**0**
	Adenocarcinoma, NOS	43	25	18	0	0
	Mucinous Producing Adenocarcinoma	8	3	5	0	0
	Signet Ring Cell Carcinoma	3	2	1	0	0
	Squamous Cell Carcinoma	3	2	1	0	0
	Carcinoma, NOS	2	2	0	0	0
	Cloacogenic Carcinoma	1	1	0	0	0
LIVER/INTRAHEPATIC BILE DUCTS		**95**	**71**	**22**	**1**	**1**
	Hepatocellular Carcinoma	88	68	20	0	0
	Cholangiocarcinoma	3	1	2	0	0
	Mucinous Adenocarcinoma	1	1	0	0	0
	Carcinoma, NOS	1	1	0	0	0
	Rhabdomyosarcoma	1	0	0	1	0
	Malignant Neoplasm, NOS	1	0	0	0	1

Primary Site Table (cont'd)

SITE / HISTOLOGY (NOS-Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
		MALE	FEMALE	MALE	FEMALE
GALLBLADDER/EXTRAHEPATIC BILE DUCTS	**20**	**8**	**12**	**0**	**0**
Adenocarcinoma, NOS	14	5	9	0	0
Carcinoma, NOS	3	1	2	0	0
Mucinous Adenocarcinoma	1	1	0	0	0
Signet Ring Cell Carcinoma	1	1	0	0	0
Papillary Adenocarcinoma	1	0	1	0	0
PANCREAS	**20**	**12**	**8**	**0**	**0**
Adenocarcinoma, NOS	12	8	4	0	0
Carcinoma, NOS	6	3	3	0	0
Carcinoid Tumor	1	1	0	0	0
Malignant Neoplasm, NOS	1	0	1	0	0
OTHER G.I. SITES	**2**	**1**	**0**	**1**	**0**
Non-Hodgkin's Lymphoma					
NASAL CAVITIES/ACCESSORY SINUSES	**12**	**8**	**3**	**1**	**0**
Squamous Cell Carcinoma	3	3	0	0	0
Esthesioneuroblastoma	3	1	2	0	0
Non-Hodgkin's Lymphoma	3	2	0	1	0
Carcinoma, NOS	2	1	1	0	0
Adenoid Cystic Carcinoma	1	1	0	0	0
LARYNX	**37**	**33**	**4**	**0**	**0**
Squamous Cell Carcinoma	32	29	3	0	0
Verrucous Carcinoma	1	1	0	0	0
Adenosquamous Carcinoma	1	1	0	0	0
Papillary Squamous Cell Carcinoma	1	1	0	0	0
Neuroendocrine Carcinoma	1	1	0	0	0
Malignant Neoplasm, NOS	1	0	1	0	0
BRONCHUS/LUNG	**85**	**69**	**16**	**0**	**0**
Squamous Cell Carcinoma	36	33	3	0	0
Adenocarcinoma, NOS	22	13	9	0	0
Carcinoma, NOS	8	7	1	0	0
Small Cell Carcinoma	4	3	1	0	0
Large Cell Carcinoma	3	2	1	0	0
Clear Cell Carcinoma	3	3	0	0	0
Bronchiolo-Alveolar Adenocarcinoma	2	2	0	0	0
Adenosquamous Carcinoma	2	2	0	0	0
Malignant Neoplasm, NOS	2	2	0	0	0
Lymphoepithelioma-Like Carcinoma	1	1	0	0	0
Carcinoid Tumor	1	0	1	0	0
Non-Hodgkin's Lymphoma	1	1	0	0	0
PLEURA	**2**	**2**	**0**	**0**	**0**
Mesothelioma					
THYMUS/MEDIASTINUM	**7**	**2**	**3**	**0**	**2**
Malignant Thymoma	2	1	1	0	0
Neuroblastoma	1	0	0	0	1
Leiomyosarcoma	1	0	1	0	0
Ganglioneuroblastoma	1	0	0	0	1
Lymphoepithelioma-Like Carcinoma	1	1	0	0	0
Carcinoma, NOS	1	0	1	0	0

Primary Site Table (cont'd)

SITE	HISTOLOGY (NOS-Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
MULTIPLE MYELOMA		**20**	**12**	**8**	**0**	**0**
BONE MARROW		**165**	**46**	**34**	**46**	**39**
	Acute Lymphoid Leukemia	84	14	5	34	31
	Acute Myeloid Leukemia	34	12	10	6	6
	Chronic Myeloid Leukemia	25	11	12	1	1
	Chronic Lymphoid Leukemia	6	4	2	0	0
	Acute Promyelocytic Leukemia	6	3	2	0	1
	Chronic Myelomonocytic Leukemia	3	0	1	2	0
	Acute Myelomonocytic Leukemia	2	0	1	1	0
	Acute Monocytic Leukemia	2	1	0	1	0
	Megakaryocytic Leukemia	1	0	0	1	0
	Hairy Cell Leukemia	1	1	0	0	0
	Malig Lymphoproliferative Disease	1	0	1	0	0
SPLEEN		**2**	**1**	**0**	**0**	**1**
	Non-Hodgkin's Lymphoma					
BONE & CARTILAGE		**60**	**24**	**13**	**13**	**10**
	Ewing's Sarcoma	25	7	5	8	5
	Osteosarcoma, NOS	16	7	1	3	5
	Chondroblastic Osteosarcoma	4	1	2	1	0
	Chondrosarcoma, NOS	4	3	1	0	0
	Non-Hodgkin's Lymphoma	3	1	1	1	0
	Malig Adamantinoma of Long Bone	2	1	1	0	0
	Juxtacortical Osteosarcoma	1	1	0	0	0
	Small Cell Osteosarcoma	1	1	0	0	0
	Malig Giant Cell Tumor of Bone	1	0	1	0	0
	Plasmacytoma	1	1	0	0	0
	Chordoma	1	1	0	0	0
	Peripheral Neuroectodermal Tumor	1	0	1	0	0
CONNECTIVE/SUBCUTANEOUS/SOFT TISSUE		**62**	**26**	**21**	**8**	**7**
	Malignant Fibrous Histiocytoma	8	3	4	1	0
	Leiomyosarcoma	7	2	5	0	0
	Non-Hodgkin's Lymphoma	6	2	4	0	0
	Synovial Sarcoma	5	3	1	0	1
	Alveolar Rhabdomyosarcoma	4	1	0	1	2
	Myxoid Liposarcoma	4	2	1	1	0
	Spindle Cell Sarcoma	3	2	1	0	0
	Rhabdomyosarcoma, NOS	3	0	0	1	2
	Sarcoma, NOS	3	2	0	0	1
	Peripheral Neuroectodermal Tumor	3	1	1	1	0
	Clear Cell Sarcoma of Tendon	2	0	2	0	0
	Liposarcoma	2	2	0	0	0
	Malignant Neurilemmoma	2	2	0	0	0
	Embryonal Rhabdomyosarcoma	1	0	0	1	0
	Fibrosarcoma, NOS	1	0	0	1	0
	Malignant Neuroepithelioma	1	0	1	0	0
	Ganglioneuroblastoma	1	0	0	0	1
	Malignant Mesenchymoma	1	1	0	0	0
	Malignant Hemangioendothelioma	1	0	1	0	0
	Kaposi's Sarcoma	1	1	0	0	0
	Neuroblastoma	1	0	0	1	0
	Extraskeletal Chondrosarcoma	1	1	0	0	0
	Extraskeletal Ewing's Sarcoma	1	1	0	0	0

Primary Site Table (cont'd)

SITE	HISTOLOGY (NOS-Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
SKIN (MELANOMA)		**8**	**3**	**5**	**0**	**0**
SKIN (NON-MELANOMA)		**69**	**40**	**26**	**2**	**1**
	Basal Cell Carcinoma	27	14	12	0	1
	Squamous Cell Carcinoma	20	10	8	2	0
	Kaposi's Sarcoma	10	10	0	0	0
	Dermatofibrosarcoma	7	3	4	0	0
	Mycosis Fungoides	4	3	1	0	0
	Sebaceous Adenocarcinoma	1	0	1	0	0
BREAST, FEMALE		**277**	**0**	**277**	**0**	**0**
	Duct Cell Carcinoma	218	0	218	0	0
	Lobular Carcinoma	20	0	20	0	0
	Paget's Disease & Duct Cell Ca	10	0	10	0	0
	Carcinoma, NOS	7	0	7	0	0
	Medullary Carcinoma	5	0	5	0	0
	Comedocarcinoma	4	0	4	0	0
	Mucinous Adenocarcinoma	3	0	3	0	0
	Paget's Disease	2	0	2	0	0
	Adenocarcinoma, NOS	2	0	2	0	0
	Non-Hodgkin's Lymphoma	2	0	2	0	0
	Inflammatory Carcinoma	1	0	1	0	0
	Duct and Lobular Carcinoma	1	0	1	0	0
	Intracystic Carcinoma, Non-Invasive	1	0	1	0	0
	Hemangiosarcoma	1	0	1	0	0
BREAST, MALE		**2**	**2**	**0**	**0**	**0**
	Duct Cell Carcinoma	1	1	0	0	0
	Papillary Carcinoma	1	1	0	0	0
CERVIX UTERI		**47**	**0**	**47**	**0**	**0**
	Squamous Cell Carcinoma	41	0	41	0	0
	Adenocarcinoma, NOS	3	0	3	0	0
	Clear Cell Carcinoma	1	0	1	0	0
	Adenosquamous Carcinoma	1	0	1	0	0
	Carcinoma, NOS	1	0	1	0	0
PLACENTA		**9**	**0**	**9**	**0**	**0**
	Choriocarcinoma	8	0	8	0	0
	Trophoblastic Tumor	1	0	1	0	0
CORPUS UTERI		**19**	**0**	**18**	**0**	**1**
	Adenocarcinoma	9	0	9	0	0
	Endometrial Stromal Sarcoma	4	0	3	0	1
	Endometrioid Carcinoma	2	0	2	0	0
	Papillary Serous Carcinoma	1	0	1	0	0
	Mucinous Adenocarcinoma	1	0	1	0	0
	Mullerian Mixed Tumor	1	0	1	0	0
	Leiomyosarcoma	1	0	1	0	0
OVARY		**54**	**0**	**51**	**0**	**3**
	Papillary Serous Cystadenocarcinoma	7	0	7	0	0
	Adenocarcinoma, NOS	7	0	7	0	0
	Carcinoma, NOS	6	0	6	0	0
	Papillary Adenocarcinoma	5	0	5	0	0
	Endometrioid Carcinoma	4	0	4	0	0

Primary Site Table (cont'd)

SITE	HISTOLOGY (NOS-Not Otherwise Specified)	ALL CASES	ADULTS MALE	ADULTS FEMALE	PEDIATRICS MALE	PEDIATRICS FEMALE
OVARY (cont'd)						
	Mucinous Cystadenocarcinoma	4	0	4	0	0
	Endodermal Sinus Tumor	3	0	1	0	2
	Dysgerminoma	3	0	3	0	0
	Papillary Serous, Borderline Malig	3	0	3	0	0
	Papillary Cystadenocarcinoma	2	0	2	0	0
	Serous Cystadenoma, Borderline Malig	2	0	2	0	0
	Mucinous Cystadenoma, Border Malig	2	0	2	0	0
	Malignant Neoplasm, NOS	2	0	2	0	0
	Serous Cystadenocarcinoma	1	0	1	0	0
	Mixed Germ Cell Tumor	1	0	0	0	1
	Teratoma	1	0	1	0	0
	Malignant Granulosa Cell Tumor	1	0	1	0	0
OTHER FEMALE GENITAL ORGANS		**4**	**0**	**4**	**0**	**0**
	Squamous Cell Carcinoma	2	0	2	0	0
	Basal Cell Carcinoma	1	0	1	0	0
	Mucinous Adenocarcinoma	1	0	1	0	0
PROSTATE		**49**	**49**	**0**	**0**	**0**
	Adenocarcinoma	44	44	0	0	0
	Carcinoma, NOS	5	5	0	0	0
TESTIS		**14**	**12**	**0**	**2**	**0**
	Seminoma	6	6	0	0	0
	Mixed Germ Cell Tumor	3	3	0	0	0
	Endodermal Sinus Tumor	3	1	0	2	0
	Alveolar Rhabdomyosarcoma	1	1	0	0	0
	Teratocarcinoma	1	1	0	0	0
OTHER MALE GENITAL ORGANS		**1**	**1**	**0**	**0**	**0**
	Squamous Cell Carcinoma					
URINARY BLADDER		**56**	**47**	**8**	**1**	**0**
	Transitional Cell Carcinoma	22	18	4	0	0
	Papillary Transitional Cell Ca	19	18	1	0	0
	Squamous Cell Carcinoma	8	5	3	0	0
	Adenocarcinoma, NOS	2	2	0	0	0
	Carcinoma, NOS	2	2	0	0	0
	Embryonal Rhabdomyosarcoma	1	0	0	1	0
	Carcinosarcoma	1	1	0	0	0
	Non-Hodgkin's Lymphoma	1	1	0	0	0
KIDNEY/URETER		**48**	**21**	**14**	**6**	**7**
	Renal Cell Carcinoma	24	17	7	0	0
	Nephroblastoma	11	0	0	5	6
	Clear Cell Adenocarcinoma	5	2	3	0	0
	Adenocarcinoma, NOS	2	0	2	0	0
	Transitional Cell Carcinoma	1	0	1	0	0
	Chromophobe Carcinoma	1	1	0	0	0
	Granular Cell Carcinoma	1	0	1	0	0
	Clear Cell Sarcoma of Kidney	1	0	0	1	0
	Carcinoma, NOS	1	1	0	0	0
	Malignant Neoplasm, NOS	1	0	0	0	1

Primary Site Table (cont'd)

SITE / HISTOLOGY (NOS-Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
		MALE	FEMALE	MALE	FEMALE
EYE	**24**	**4**	**1**	**10**	**9**
Retinoblastoma	16	0	0	8	8
Melanoma	3	2	0	0	1
Non-Hodgkin's Lymphoma	2	1	0	1	0
Squamous Cell Carcinoma	1	1	0	0	0
Small Cell Carcinoma	1	0	1	0	0
Malignant Neoplasm, NOS	1	0	0	1	0
BRAIN	**126**	**43**	**22**	**36**	**25**
Glioblastoma	27	15	8	2	2
Astrocytoma, NOS	23	12	6	4	1
Medulloblastoma	19	1	1	11	6
Malignant Glioma, NOS	15	5	1	4	5
Pilocystic Astrocytoma	14	0	0	7	7
Anaplastic Astrocytoma	5	3	1	0	1
Oligodendroglioma	5	3	2	0	0
Primitive Neuroectodermal Tumor	4	0	1	2	1
Non-Hodgkin's Lymphoma	4	2	2	0	0
Pleomorphic Xanthoastrocytoma	3	1	0	1	1
Ependymoma	3	0	0	2	1
Fibrillary Astrocytoma	1	0	0	1	0
Germinoma	1	1	0	0	0
Carcinoma, NOS	1	0	0	1	0
Malignant Neoplasm, NOS	1	0	0	1	0
OTHER NERVOUS SYSTEM	**6**	**1**	**1**	**4**	**0**
Malignant Glioma, NOS	2	0	0	2	0
Malignant Meningioma	2	1	1	0	0
Pilocytic Astrocytoma	1	0	0	1	0
Non-Hodgkin's Lymphoma	1	0	0	1	0
THYROID	**163**	**46**	**113**	**2**	**2**
Papillary Carcinoma	115	28	85	1	1
Papillary & Follicular Adenoca	19	6	13	0	0
Medullary Carcinoma	8	5	2	0	1
Follicular Adenocarcinoma	7	2	5	0	0
Anaplastic Carcinoma	6	2	4	0	0
Carcinoma, NOS	3	1	1	1	0
Non-Hodgkin's Lymphoma	3	2	1	0	0
Malignant Neurilemmoma	1	0	1	0	0
Trabecular Adenocarcinoma	1	0	1	0	0
OTHER ENDOCRINE GLANDS	**11**	**1**	**0**	**8**	**2**
Neuroblastoma	5	0	0	4	1
Germinoma	4	0	0	4	0
Pineoblastoma	1	0	0	0	1
Mixed Germ Cell Tumor	1	1	0	0	0
LYMPH NODES, NON-HODGKIN'S LYMPHOMA (Excluding Extra-Nodal Lymphoma)	**81**	**44**	**27**	**8**	**2**
Large Cell, Diffuse	26	16	10	0	0
Non-Hodgkin's Lymphoma	11	6	3	2	0
Immunoblastic	7	5	2	0	0
Large Cell, Follicular	7	4	3	0	0
Lymphoblastic	4	0	1	2	1
Ki-1	4	2	1	1	0

Primary Site Table (cont'd)

SITE	HISTOLOGY (NOS-Not Otherwise Specified)	ALL CASES	ADULTS MALE	ADULTS FEMALE	PEDIATRICS MALE	PEDIATRICS FEMALE
LYMPH NODES, NON-HODGKIN'S LYMPHOMA (cont'd)						
	(Excluding Extra-Nodal Lymphoma)					
	Burkitt's	4	0	0	3	1
	Small Lymphocytic	4	2	2	0	0
	Small Cleaved Cell, Follicular	3	3	0	0	0
	T-Cell Rich B-Cell	2	2	0	0	0
	Monocytoid B-Cell	2	1	1	0	0
	Mixed Small & Large Cell, Diffuse	2	1	1	0	0
	Follicular, NOS	2	2	0	0	0
	Lymphoplasmacytic	1	0	1	0	0
	Mixed Small Cleaved & Lge Cell, Foll	1	0	1	0	0
	Small Cleaved Cell, Diffuse	1	0	1	0	0
LYMPH NODES, HODGKIN'S DISEASE		**75**	**33**	**19**	**15**	**8**
	Nodular Sclerosis	61	24	18	12	7
	Lymphocytic Predominance	7	5	1	0	1
	Mixed Cellularity	5	2	0	3	0
	Hodgkin's Disease, NOS	2	2	0	0	0
PRIMARY UNKNOWN		**41**	**21**	**19**	**1**	**0**
	Adenocarcinoma	15	8	7	0	0
	Carcinoma, NOS	13	4	9	0	0
	Malignant Neoplasm, NOS	3	1	2	0	0
	Clear Cell Adenocarcinoma	2	2	0	0	0
	Neuroendocrine Carcinoma	2	1	1	0	0
	Squamous Cell Carcinoma	1	1	0	0	0
	Signet Ring Cell Carcinoma	1	1	0	0	0
	Papillary Carcinoma	1	1	0	0	0
	Adenosquamous Carcinoma	1	1	0	0	0
	Carcinoid Tumor	1	1	0	0	0
	Malignant Gastrinoma	1	0	0	1	0

TABLE 10

PATIENTS WITH MULTIPLE PRIMARIES
1 9 9 6

PRIMARY SITE 1996	HISTOLOGY (NOS-Not Otherwise Specified)	OTHER PRIMARIES (PREVIOUS OR CONCURRENT)	ALL CASES	MALE	FEMALE
			65	32	33
ORAL CAVITY			4	3	1
Sq Cell Ca-Buccal Mucosa		Bladder - Sq Cell Ca	1	1	0
Sq Cell Ca-Buccal Mucosa		Tongue - Sq Cell Ca	1	1	0
Verrucous Ca - Lower Gum		Prostate - Adenoca	1	1	0
NHL - Tonsil		Breast - Duct Cell Ca	1	0	1
NASOPHARYNX			2	2	0
Undiff Carcinoma		Larynx - Sq Cell Ca	1	1	0
Undiff Carcinoma		Ethmoid Sinus - Sq Cell Ca	1	1	0
ESOPHAGUS			1	1	0
Squamous Cell Carcinoma		Larynx - Sq Cell Ca	1	1	0
STOMACH			2	1	1
Adenocarcinoma		Larynx - Sq Cell Ca	1	1	0
Leiomyosarcoma		Uterus - Adenocarcinoma	1	0	1
COLON			2	2	0
Carcinoma, NOS		Prostate - Adenocarcinoma	1	1	0
Adenocarcinoma		Ileum - NHL	1	1	0
RECTUM			3	2	1
Adenocarcinoma		Hodgkin's Disease	1	0	1
Adenocarcinoma		Colon - Adenocarcinoma	1	1	0
Mucinous Adenocarcinoma		Colon - Adenoca in Adenomatous Polyp	1	1	0
LIVER			1	1	0
Hepatocellular Ca		Tongue - Sq Cell Ca			
LARYNX			1	0	1
Squamous Cell Carcinoma		Breast - Duct Cell Ca			
LUNG			3	3	0
Carcinoma, NOS		Bladder - Trans Cell Ca	1	1	0
Bronchiolo-Alveolar Ca		Larynx - Sq Cell Ca	1	1	0
Adenosquamous Ca		Kidney - Renal Cell Ca	1	1	0
BONE MARROW			1	0	1
Acute Myeloid Leukemia		Breast - Duct Cell Ca	1	0	1
SOFT TISSUE			1	1	0
Malig Fibrous Histiocytoma		Skin - Dermatofibrosarcoma			
SKIN			1	1	0
Basal Cell Carcinoma*		Kidney - Renal Cell Ca LNs - NHL			

Multiple Primaries (cont'd)

PRIMARY SITE 1996	HISTOLOGY (NOS-Not Otherwise Specified)	OTHER PRIMARIES (PREVIOUS OR CONCURRENT)	ALL CASES	MALE	FEMALE
BREAST			**22**	**0**	**22**
	Duct Cell Carcinoma	Contralateral Breast	18	0	18
	Duct Cell Carcinoma	Ovary - Malig Teratoma	1	0	1
	Medullary Carcinoma*	Contra Breast-Duct Cell Ca Same Breast - Duct Cell Ca	1	0	1
	Lobular Carcinoma	Contralateral Breast	1	0	1
	Carcinoma, NOS	Hodgkin's Disease	1	0	1
OVARY			**3**	**0**	**3**
	Endometrioid Ca	Breast - Duct Cell Ca	1	0	1
	Mucinous Cystadenoca	Skin - Basosquamous Ca	1	0	1
	Serous Cystic Tumor, Borderline Malig	Contra Ovary - Pap Serous Cystadenoma, Border Malig	1	0	1
PROSTATE			**2**	**2**	**0**
	Adenocarcinoma	Kidney - Renal Cell Ca	1	1	0
	Adenocarcinoma*	Kidney - Renal Cell Ca Bladder - Pap Trans Cell Ca	1	1	0
URINARY BLADDER			**3**	**3**	**0**
	Papillary Trans Cell Ca	Kidney - Renal Cell Ca	1	1	0
	Carcinosarcoma	Larynx - Sq Cell Ca	1	1	0
	Carcinoma, NOS	Thyroid - Pap & Follicular Ca	1	1	0
KIDNEY			**3**	**3**	**0**
	Renal Cell Carcinoma	Skin - Sq Cell Ca	1	1	0
	Renal Cell Carcinoma	Bladder - Trans Cell Ca	1	1	0
	Renal Cell Carcinoma	Bladder - Pap Trans Cell Ca	1	1	0
CONJUNCTIVA			**1**	**1**	**0**
	Squamous Cell Carcinoma	LNs - NHL			
BRAIN			**1**	**1**	**0**
	Glioblastoma	Acute Lymphoid Leukemia			
THYROID			**3**	**2**	**1**
	Follicular Adenoca	Breast - Duct Cell Ca	1	0	1
	Follicular Adenoca	Small Intestine - NHL	1	1	0
	Papillary Carcinoma*	Jejunum - Adenocarcinoma LNs - NHL	1	1	0
PINEAL GLAND			**1**	**0**	**1**
	Pineoblastoma	Retinoblastoma			
LYMPH NODES			**3**	**3**	**0**
	Non-Hodgkin's Lymphoma	Kidney - Renal Cell Ca	1	1	0
	Non-Hodgkin's Lymphoma	Skin - Kaposi's Sarcoma	1	1	0
	Non-Hodgkin's Lymphoma	Jejunum - Adenocarcinoma	1	1	0
UNKNOWN PRIMARY			**1**	**0**	**1**
	Adenocarcinoma	Gallbladder - Adenoca In-Situ			

*** Patient has three primary malignancies.**

STAGE OF DISEASE AT DIAGNOSIS

Stage in any malignant process may be defined as the particular step, phase, or extent in a tumor's development, which is one of the predictors for outcome and treatment selection assigned at the time of initial diagnosis. The microscopic appearance, extent, and biological behavior of a tumor, as well as host factors, play a part in prognosis and are therefore important in staging.

The SEER (Surveillance, Epidemiology, and End Results) Summary Staging Guide was utilized for all stageable cases. This system summarizes the disease categories into four general staging groups (i.e. in situ, localized, regional, and distant). Stage categories are based on a combination of clinical observations and operative-pathological evaluation.

Summary Staging Definitions:

IN SITU: Intraepithelial, noninvasive, noninfiltrating

LOCALIZED: Within organ

a. Invasive cancer confined to the organ of origin
b. Intraluminal extension where specified

REGIONAL: Beyond the organ of origin

a. By direct extension to adjacent organs/tissues
b. To regional lymph nodes
c. Both (a) and (b)

DISTANT: Direct extension or metastasis

a. Direct continuity to organs other than above
b. Discontinuous metastasis
c. To distant lymph nodes

Systemic diseases, i.e., leukemia and multiple myeloma and cases of unknown primary were disregarded in graphically illustrating the stages for all analytic cases seen at KFSH&RC in 1996 (Figure 13). The 16 cases unstageable at diagnosis were those patients who refused further diagnostic workup or further workup was not possible due to the patients' state of health; e.g. terminal cases or those with co-morbid conditions. Please refer also to Table 5 for the distribution of the 1996 analytic cases by site and stage at diagnosis.

In addition to the SEER Summary Staging, the cases were also staged according to the American Joint Committee on Cancer (AJCC) TNM system. This scheme is based on the premise that cancers of similar histology or site of origin share similar patterns of growth and extension. This system is based on the assessment of three components:

T: Extent of the primary tumor

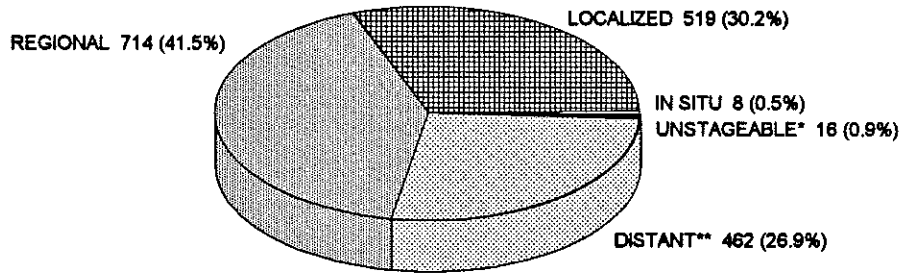
N: Absence or presence and extent of regional lymph node involvement

M: Absence or presence of distant metastasis

Analytic cases of four major sites, i.e., breast, lung, nasopharynx and Hodgkin's Disease are presented in Table 11 with their clinical group stage and yearly comparative figures from 1992 to 1996. The pathologic group stages of stomach and colorectum are also presented in the same table.

FIGURE 13

DISTRIBUTION OF ANALYTIC CASES BY STAGE (SEER) AT DIAGNOSIS - 1996 (TOTAL CASES = 1,719)



*Excludes Unknown Primaries (39 cases)
**Excludes Leukemia and Multiple Myeloma (163 cases)

FIGURE 14

DISTRIBUTION OF ANALYTIC CASES BY FIRST COURSE OF TREATMENT (SINGLY OR IN COMBINATION) 1996 (TOTAL CASES = 1,921)

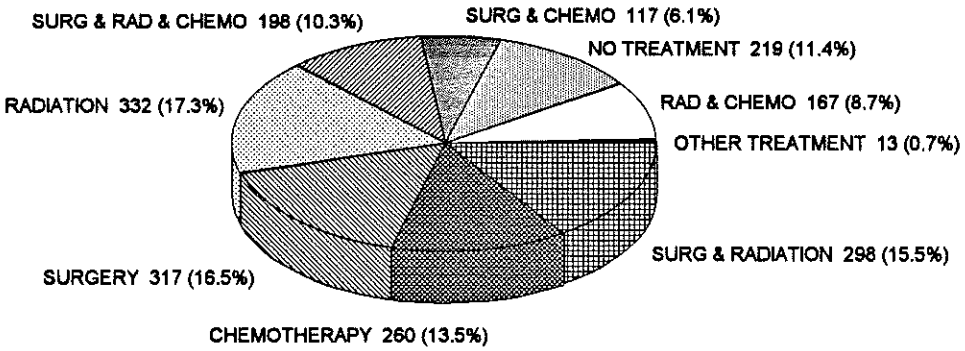


TABLE 11

AJCC CLINICAL TNM GROUP STAGE OF ANALYTIC CASES OF MAJOR SITES* BY YEAR
1992 - 1996

BREAST

Stage	1992		1993		1994		1995		1996		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
0	0	0.0	2	0.9	0	0.0	2	1.0	4	1.7	8	0.8
1	4	2.8	19	9.0	9	4.6	11	5.6	22	9.6	65	6.7
2A	22	15.4	29	13.7	44	22.6	39	19.7	52	22.6	186	19.0
2B	33	23.0	46	21.7	41	21.0	37	18.7	37	16.1	194	19.8
3A	21	14.7	26	12.3	14	7.2	19	9.6	19	8.3	99	10.1
3B	32	22.4	37	17.4	31	15.9	29	14.6	22	9.6	151	15.4
4	23	16.1	41	19.3	27	13.8	32	16.2	36	15.6	159	16.3
Unstageable	8	5.6	12	5.7	29	14.9	29	14.6	38	16.5	116	11.9
Total	143	100.0	212	100.0	195	100.0	198	100.0	230	100.0	978	100.0

LUNG

Stage	1992		1993		1994		1995		1996		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
1	5	7.3	3	4.5	13	16.9	8	10.3	2	2.6	31	8.4
2	1	1.5	2	3.0	4	5.2	2	2.6	4	5.1	13	3.6
3A	13	19.1	6	9.0	4	5.2	9	11.5	6	7.7	38	10.3
3B	11	16.2	23	34.3	24	31.1	22	28.2	26	33.3	106	28.8
4	35	51.5	24	35.8	17	22.1	28	35.9	27	34.6	131	35.6
Unstageable	3	4.4	9	13.4	15	19.5	9	11.5	13	16.7	49	13.3
Total	68	100.0	67	100.0	77	100.0	78	100.0	78	100.0	368	100.0

NASOPHARYNX

Stage	1992		1993		1994		1995		1996		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1	0	0.0	1	1.9	1	1.9	1	1.8	0	0.0	3	1.0
2	0	0.0	0	0.0	1	1.9	3	5.3	2	2.5	6	2.1
3	3	6.5	4	7.4	4	7.5	7	12.5	7	8.9	25	8.7
4	42	91.3	47	87.0	47	88.7	44	78.6	67	84.8	247	85.8
Unstageable	1	2.2	2	3.7	0	0.0	1	1.8	3	3.8	7	2.4
Total	46	100.0	54	100.0	53	100.0	56	100.0	79	100.0	288	100.0

* Excludes Lymphoma Cases

Table 11 (cont'd)

AJCC CLINICAL GROUP STAGE OF ANALYTIC CASES OF MAJOR SITE BY YEAR
1992 - 1996

HODGKIN'S DISEASE

Stage	1992		1993		1994		1995		1996		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
1A	8	12.7	12	21.1	12	17.9	16	20.5	8	11.3	56	16.6
1B	3	4.8	3	5.3	2	3.0	1	1.3	1	1.4	10	3.0
2A	15	23.8	11	19.3	19	28.4	19	24.4	20	28.2	84	25.0
2B	8	12.7	6	10.5	3	4.5	10	12.8	10	14.1	37	11.0
3A	11	17.4	6	10.5	9	13.4	10	12.8	6	8.4	42	12.5
3B	7	11.1	8	14.0	12	17.9	11	14.1	9	12.7	47	14.0
4A	2	3.2	1	1.8	1	1.5	2	2.6	3	4.2	9	2.7
4B	9	14.3	10	17.5	9	13.4	9	11.5	14	19.7	51	15.2
Total	63	100.0	57	100.0	67	100.0	78	100.0	71	100.0	336	100.0

AJCC PATHOLOGIC TNM GROUP STAGE OF ANALYTIC CASES OF MAJOR SITES* BY YEAR
1992 - 1996

STOMACH

Stage	1992		1993		1994		1995		1996		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1A	2	6.5	0	0.0	1	2.1	1	2.1	2	3.9	6	3.0
1B	1	3.2	0	0.0	3	6.4	2	4.3	3	5.9	9	4.4
2	4	12.9	6	21.4	7	14.9	4	8.5	0	0.0	21	10.3
3A	3	9.7	4	14.3	6	12.8	5	10.6	13	25.5	31	15.2
3B	1	3.2	3	10.7	3	6.4	6	12.8	4	7.8	17	8.3
4	5	16.1	0	0.0	1	2.1	2	4.3	1	2.0	9	4.4
Unstageable	15	48.4	15	53.6	26	55.3	27	57.4	28	54.9	111	54.4
Total	31	100.0	28	100.0	47	100.0	47	100.0	51	100.0	204	100.0

COLON, RECTUM

Stage	1992		1993		1994		1995		1996		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
0	0	0.0	0	0.0	1	1.6	0	0.0	0	0.0	1	0.3
1	5	7.3	2	3.8	3	4.7	4	5.7	3	3.8	17	5.1
2	11	16.2	8	15.4	8	12.5	16	22.9	17	21.2	60	18.0
3	21	30.9	12	23.1	19	29.7	14	20.0	10	12.5	76	22.8
4	3	4.4	8	15.4	5	7.8	5	7.1	6	7.5	27	8.1
Unstageable	28	41.2	22	42.3	28	43.7	31	44.3	44	55.0	153	45.7
Total	68	100.0	52	100.0	64	100.0	70	100.0	80	100.0	334	100.0

* Excludes Lymphoma Cases

PALLIATIVE CARE FOR PATIENTS WITH ADVANCED CANCER

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Introduction

The true incidence of cancer in the Kingdom of Saudi Arabia (KSA) is just now being measured. Hospital statistics reflect patterns of referral, rather than the real incidence of the various types of cancer. In 1993 a National Cancer Registry (NCR) was established, collecting data from all regions, and publishing its first report in 1996. Over the next few years, the NCR will establish a baseline for the incidence of cancer, and provide a means of monitoring the success of its treatment for the whole country.

Much about cancer in KSA can be implied from the experience of other countries. Cancer is particularly a disease of old age when it is one among many causes of morbidity and mortality. Although cancer becomes more common as we age, it differs from other diseases of the elderly, in that cancer can occur at any age. With its large population of young people, cancer in children is also a significant problem in KSA. 12.6% of the cancer patients seen at King Faisal Specialist Hospital and Research Centre (KFSH&RC) are children. This is a much higher proportion than are seen in similar referral centers in the West.[1] The average life expectancy for men and women in the Middle East is estimated to be 62 years. By comparison, in the West life expectancy is 75 years or more.[2] With the rapid improvements in nutrition, sanitation, housing, and the highly effective vaccination programs that have been developed, the Saudi populations life expectancy will rapidly increase. The national census conducted in 1992, shows that the average life expectancy here is already 70 years. We can reasonably predict that this increase in life expectancy will be accompanied by an alteration in the patterns of disease similar to that in Western countries; where infectious diseases leading to premature death have been replaced by more chronic illnesses of old age, such as heart disease, cancer, and cerebro-vascular disease. In the U.S.A., cancer accounts for 22% of all deaths, second only to heart disease.[3] In general, in Western countries, one in every three people will develop cancer during their lifetime, and one in every four will die of it.

Prevention

McDonald of Canada has provided a useful description of *four phases of cancer "prevention"* covering all aspects of the disease:

1. Prevention of the disease (public education and policy).
2. Prevention of advanced disease (early diagnosis programs).
3. Prevention of death (anti-cancer treatment).
4. *Prevention of suffering (palliative care)*[4]

Cancer is one of the most treatable of all chronic illnesses. This aspect of cancer is often overlooked, because the disease arouses such fear. It is the most feared of all illnesses, and its diagnosis is usually associated in the patient's mind with premature and unpleasant death. In fact, however, in the West 40-50% of cancer patients will be cured; that is, they will have a normal life expectancy for their age and sex.[2] In children the cure rates are higher, over 60%.[5] However, these figures rely upon the fact that 70% of cancer patients in the West present with "early" cancer, stage 1 and 2. At KFSH&RC only 30% of patients present with localized stage 1 or 2 disease. Nearly 70% have stage 3 or 4 advanced disease with a consequently much worse prognosis.[1] As these patients are accepted at this major tertiary referral center on the basis of their likelihood of responding to treatment, other centers are likely to see even more advanced disease. It is likely that 80% or more of cancer patients in this country present with advanced disease, when cure rates will be low. Even so after surgery, chemotherapy, or radiotherapy, or by the use of one or all three modalities, dramatic remissions can be obtained which may last from months to

years before the patient's condition deteriorates again. At present however, probably 70% or more of cancer patients in Saudi Arabia will eventually die of their disease.

While there is constant incremental progress in the treatment of cancer, with improvements continually being introduced into the Kingdom, major progress could be made if patients could be encouraged to present early. This involves firstly, improving the public's knowledge about their personal health problems and the benefit of presenting early with their symptoms, and secondly, to ensure that patients with symptoms do not have a delay in diagnosis and treatment.

The Public's Perception of Cancer

Bedikian and Saleh interviewed one hundred Saudi patients with cancer. They reported 92% had an adverse reaction to the diagnosis, and the median duration of symptoms was from 3-5 months. None had received professional assistance for these problems, and the authors recommended psycho-social support be available to patients as part of their total management.[6] Bedikian in a further study interviewed two hundred and fifty healthy Saudis on their attitudes and knowledge of cancer. This study revealed a considerable degree of fear and anxiety about this disease.[7] Similarly, Ibrahim et. al. interviewed six hundred adults on their attitudes to cancer and confirmed the high level of fear and misperceptions about the disease.[8] Both groups of authors called for more comprehensive health education and awareness of cancer as a treatable disease.

Palliative Care

Dying is as natural an event as being born. This is recognized by Islam and its acceptance of death as an expression of God's will. In Western countries where the population has a long life span and cancer is common, dying of cancer has a special dimension that has made it the most feared of all illnesses. This is because *cancer deaths are rarely easy*. The distress it causes is legend. Eighty percent of dying cancer patients will suffer pain, and in 60% it will be severe and require strong analgesics of the morphine type.[9] Pain is only one of the distressing symptoms caused by advanced cancer. Anorexia, weight loss, tiredness, malaise, shortness of breath, and confusion are some of the other many symptoms that cancer can cause as it spreads to vital organs. Added to the physical distress of advancing cancer is the emotional distress of impending death.

The explosion of medical technology and the opportunity to finally cure major disease began at the end of the nineteenth century. This new era may have obscured the need to provide a supportive and caring environment for patients with chronic illnesses. Cancer was once considered by some to be an untreatable disease, and eminent physicians were known to discharge cancer patients once they were diagnosed, on the grounds that nothing further could be done for them. Presently, an enormous amount of knowledge has evolved on the nature and treatment of cancer. Much of this research for newer and better methods of cure has been concentrated on changes at a cellular level. However, in the last twenty years, there has also evolved a body of knowledge on the treatment of the symptoms of advanced cancer, which has failed anti-cancer treatments; this has now become a specialized area of interest for doctors and nurses called palliative medicine.[10] While its practitioners are few, its attitudes are important to medical systems in general, for the following reasons:

1. **Providing Continuity of Care**

   In most Western countries patient care is based upon the primary care physician (family practitioner). This doctor will have a formal or informal "contract" with an individual or family to undertake their medical care and act on their behalf at all times. A well organized family practice or polyclinic will have a computerized "template" of routine examinations, screening investigations, and a complete medical record of the patient and their family environment. When a patient has a terminal illness, they have a doctor they know and can trust, and in turn the doctor knows both the patient and their family. This continuity of care is important, particularly for chronic illnesses and for a terminal disease. It means

that *"no cure" is not the same as saying "no care"*. Unfortunately at present in Saudi Arabia, patients with either a terminal or chronic illness have their continuing care, even as outpatients, provided mainly by a hospital service.[11] This type of care should become an essential part of the primary health care system of the Kingdom.

2. Cure Or Palliation?

The emphasis for cancer patients in Saudi Arabia is on curative treatment. There is a strong tendency here to deny the patient information on their illness. This is a problem shared by other countries, but for the last twenty years in Western countries, doctors have treated the individual patient as an autonomous agent, capable of receiving information and acting upon it. This allows the individual patient to give true informed consent by understanding the advantages and disadvantages of the proposed treatment. This also allows the patient to more fully participate and cooperate with the treatment, and by such compliance improve the chance of success.[12] In Saudi Arabia, the predominant principle is "beneficence", where the patient is viewed as one member of the larger family and the family is responsible for the patient. The consent for the patient's treatment is usually a substitute consent by the family, whose purpose is to avoid disturbing the patient emotionally. By this means, the family consider they are protecting the patient from harm, and that if the patient is told the truth, then they will not be able to adapt to the situation and may lose hope. This attitude seems to particularly apply to female patients. However, Abu Aisha wrote that, it is recognized in Saudi Arabian law that a woman is legally considered to be a responsible citizen, and it follows therefore that an adult female patient of sound mind has the right to give her own consent after being adequately informed of the nature of her illness.[13] There is now ample evidence that patients cope better with a serious illness if they are informed.[12] Without such vital information on their illness Saudi patients will continue to travel overseas at considerable cost, with the unrealistic expectation that they can find a cure somewhere. Unfortunately, the development of market medicine elsewhere in the world feeds this expectation, by giving treatment which may be neither necessary or appropriate. If the only purpose of medicine is the saving of people from death, then obviously, medicine cannot win. The art of good medicine, is to decide when life sustainment is no longer possible, and therefore when to allow death to occur without further impediment.[14] *Physicians should also bear some responsibility for the quality of their patient's death.*[15]

3. The Relief of Pain

Chronic pain, particularly as it occurs in cancer, has several distressing features:

- It gets progressively worse.
- It has no meaning.
- It creates a feeling of hopelessness.
- It dominates the patient's life.
- It can destroy their will to live.

One part of pain is its perception, the other the emotional response to it. This is why people experience different degrees of pain. Pain is precisely what the patient says it is, and hurts as much as they say it hurts. Pre-conceived ideas of how much pain patients will or should have are best avoided. There is a general lack of knowledge of pain relief in the Kingdom, and in many hospitals adequate analgesics of the morphine type are simply not available. There is an unreasonable fear of morphine addiction amongst patients and their families, but studies have convincingly shown that addiction is never a problem in a terminal illness.[16]

The important point for doctors to know is that no patient needs to endure pain so severe that their work, sleep, and quality of life are ruined. *It should be rare for dying cancer patients to have uncontrolled pain.* The World Health

Organization recommends a three step process in pain control moving from simple analgesics such as tylenol on the first step, to tylenol and codeine based compounds ± NSAID's on the second step, and morphine or similar compounds for patients with severe or step 3 pain.[19] Each of these regimens require that medications be given regularly around the clock, not PRN. This requires careful monitoring by the physician of the patient's pain level, and their response to medications. Regular analgesics and continuity of care is the secret to good pain control.

Cultural Aspects

The family unit is the structural foundation of Saudi society. The impression is that patients here cope better with a terminal illness in their home, than happens elsewhere in the West. This is probably because of the close family bonds and their strong Islamic faith with its obligation to provide for parents or children in case of need, and to help make their lives as comfortable as possible. The corollary of this is, that a small input of medical and nursing care, results in a magnified response by the extended family in the care of a patient. This can be very gratifying to the doctor and nurse.

There is an impression that palliative care in the Kingdom is confused with euthanasia, which is totally forbidden by Islam.[17] Palliative care is the moral and ethical alternative to euthanasia. Providing comfort, relieving distress, controlling pain, and offering a service that is available 24 hours a day, sustains the patient's hope. It is not based on the false hope of providing inappropriate and ineffective treatments. This society quite rightly sets great store by hope, and palliative care increases that hope, that each day may be more comfortable than the last.

The King Faisal Specialist Hospital & Research Centre

Palliative Care Program

In 1991 a Home Health Care Program was developed at KFSH&RC. This was in response to concerns by staff regarding the distress suffered by patients with terminal cancer, and the loss of the benefits of good quality medical care once the patient returned home.[18] Two years of planning and research went into developing the program. What began as essentially a nursing service for patients with a terminal illness, developed over the years into a nursing and medical service. These efforts resulted in the development of a Section of Palliative Care Medicine in the Department of Oncology in 1996; this appears to be the first such service in the Arab world.

At present, a multi-disciplinary team includes: three palliative care consultants, six nurses, five translator/drivers, a palliative care nurse clinician, and social workers. This team provides total care for the patient and support for the family, as a unit. The program consults with other health disciplines to provide the most appropriate care. The service runs 24 hours a day, seven days a week. To date, over 1350 patients living in Riyadh have been referred to the Home Health Care program. An increasing number of other patients who live outside Riyadh are being followed up in the Palliative Care outpatient clinics. While the Home Health Care Program in Riyadh includes cases of chronic illness, palliative care for a terminal illness makes up 75-80% of the workload. At present the program has between 40-50 terminally ill patients at any one time being cared for at home in Riyadh. Six in-patient beds are provided in the hospital. Many patients require at least one admission for control of symptoms that cannot be managed at home, and for stabilization of symptoms before they are transferred either to home or to a hospital elsewhere in the Kingdom. The average duration of stay has been 6-7 days.

Conclusion

What are the aims of a good health service? The American President's Commission for the study of ethical problems in medicine provided the following definition: "to provide treatment that will restore patients to as near normal or usual a

quality of life as is possible under the circumstances" or, put more simply, "to maximize the patient's well-being".[19]

The patient's perception of this is that the health services will:

1. Restore them to good health.
2. Improve their function.
3. Relieve their suffering (particularly if the first two are not possible).

That we fail to cure all our patients, does not mean that we should fail to care for them and relieve their suffering. The purpose of a palliative care service at the KFSH&RC is "the care and study of patients with active, progressive, far advanced disease; for whom cure is impossible, the prognosis predictably short, and the focus of care is the quality of life". Palliative Care has broadened the spectrum of health services available to cancer patients in the Kingdom. It has proven that it is possible to provide palliative care of a standard similar to that in a Western country. Cultural aspects of life in the Middle East, in particular the strong family bonds, the acceptance of matters of life and death, and the emphasis on hospitality, actually enhance and promote this form of care, which empowers Saudi families to care for dying patients until the end of life.

References

1. 1995. Annual Report of the Tumor Registry. Oncology Department, MBC 64, King Faisal Specialist Hospital and Research Center, Riyadh.
2. WHO. Cancer Control in the Eastern Mediterranean Region. EMRO Technical Publications, series 20. 1995; WHO Regional Office, Alexandria, Egypt.
3. Boring CC, Squire TS, Tong T. Cancer Statistics 1992. CA 1992; 42: 19.
4. McDonald N. Palliative Care: The 4th Phase of Cancer Prevention. Cancer Detection and Prevention. 1991; 15:253-5.
5 National Cancer Institute. Ries LA, Hankey BF, Miller BA, et al (editors). Cancer Statistics Review, 1973-88. NIH Publication, No. 91-2789. Bethesda, 1991.
6. Bedikian AY, Saleh V. An Evaluation of the Need for Psychosocial counseling for Saudi Cancer Patients. King Faisal Specialist Hosp. Med. J. 1985; 5: 91-98.
7. Bedikian AY, Thompson SE. Saudi Community Attitudes Towards Cancer. Ann Saudi Med 1985; 5: 161-7.
8. Ibrahim EM, Al Muhanna FA, Saied I, et al. Public Knowledge, Misperceptions and Attitudes about Cancer in Saudi Arabia. Ann Saudi Med 1991; 11: 518-23.
9. Cancer Pain Relief and Palliative Care. Technical Report Series, 1990. WHO, Geneva.
10. Doyle D, Hanks GWC, MacDonald N. Oxford Textbook of Palliative Medicine (1993). Oxford University Press, Oxford.
11. Al-Swailem AF. Assessing Health care Delivery in Saudi Arabia. Ann. Saudi Med. 1990; 10(1): 63-68.
12. Manuel GM, Roth S, Keefe FJ, et al. Coping with Cancer. Journal of Human Stress. 1987: 149-58.
13 Abu Aisha H. Woman in Saudi Arabia: Do They Not Have the Right to Give Their Own Consent for Medical Procedures? Saudi Med. J. 1985; 6: 74-77.
14. Callahan D. Ethics and the Medical Ambivalence Towards Death. Humane Med. 1994; 10: 172-183.
15. Goals of Palliative Cancer Therapy. Editor F. Porzsolt. Cancer Treatment Reviews (1993), Vol 19. Supplement A. (Contributions to a workshop sponsored by the German Ministry of Health).
16. Zenz M, Willweber-Strumpf A. Opiophobia and Cancer Pain in Europe. Lancet 1993; 341: 1075-76.
17. Newspaper Report on the Seventh Conference of the Islamic Fiqh Academy. Arab News. May 16th, 1992.
18. Gray AJ, Ezzat A, Volker S. Developing Palliative Care Services for Terminally Ill Patients in Saudi Arabia. Ann Saudi Med, 1995, 15 (4): 370-376.

19. Definition from the American President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioural Research. Washington, D.C. 1983. Government Printing Office.

EXTRANODAL NON-HODGKIN'S LYMPHOMA:
THE PREDICTIVE VALUE OF THE INTERNATIONAL PROGNOSTIC INDEX

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Non-Hodgkin's lymphoma (NHL) is common in Saudi Arabia, accounting for 7.8% of all newly diagnosed malignancies. It ranks second in males and fourth in females. Only 20% of the patients are diagnosed at an early stage, according to the 1994 National Cancer Registry Report. At King Faisal Specialist Hospital and Research Centre (KFSH&RC) the majority (93%) of NHL are of aggressive histology, with extranodal involvement occurring in 34%.

It is increasingly recognized that a number of prognostic factors may influence the outcome in aggressive NHL. In recent attempts to categorize NHL patients uniformly, members of the international non-Hodgkin's lymphoma prognostic factor project, formulated a predictive model using recognized prognostic factors such as: age, stage, performance status (PS), number of extranodal sites and serum level of lactic dehydrogenase (LDH). This International Prognostic Index (IPI) classified patients into low, low-intermediate, intermediate-high and high risk categories; depending on the number of risk factors where complete remission (CR), relapse free survival (RFS) and overall survival (OS) correlate with the prognostic subgrouping. This index, however, included all patient groups.

A study was performed at KFSH&RC to test the predictive value of IPI in patients with early stage extranodal NHL. This included 106 consecutive patients referred to KFSH&RC between 1985 and 1994, who met the study criteria of age >15 years, stage IE and stage IIE extranodal NHL of intermediate and high grade histologies (excluding lymphoblastic lymphoma), as per the International Working Formulation (IWF). The patient characteristics are shown in Table 1 and the extranodal sites are shown in Table 2.

The prognostic index for each patient was calculated by scoring the absence or presence of a risk factor as 0 or 1, respectively. These were: age (<60 vs >60 years), performance status (ECOG 0, 1 vs >2), extranodal site (0, 1 vs >1) and serum LDH (normal vs elevated). Patients were grouped into three risk categories: low risk 80 (76%), low-intermediate 13 (12%) and intermediate-high 13 (12%). None was in the high risk group.

The management of these patients utilizing either radiation and/or chemotherapy is shown in Table 3. Anthracyclin based combination chemotherapy was used in the majority (85%). The WHO criteria for response and the statistical program SPSS were used to analyze the data. Clinical complete remission (CR) was achieved in 97 (91%), partial remission (PR) in 4 (4%), progressive disease (PD) in 2 (2%), while 3 (3%) are not assessable for response because they did not complete the treatment. Twenty patients have relapsed (including 4 who died of other diseases) and 9 were lost to follow up. At the time of analysis, 73 patients remain alive and disease free, 8 are alive with active disease and 25 had died (including 8 deaths due to other causes). CR rates and 5 years relapse free and overall survivals in relation to the index categories are shown in Table 4 and Figures 1 and 2.

It could be concluded, therefore, that the International Prognostic Index is a good predictor model in extranodal, aggressive NHL in the KFSH&RC patient population. While no substantial change in therapeutic intervention is required for patients at low and low-intermediate risk categories, patients who are at intermediate-high risk should be considered for more aggressive or experimental approaches.

Table 1
PATIENT CHARACTERISTICS

		Number	Percentage
Sex	Male	66	62
	Female	40	38
Age	<60	65	61
	>60	41	39
B Symptoms	Yes	47	44
	No	59	56
Performance Status WHO	0-1	71	67
	≥2	35	33
Bulk of Disease	<10cm	56	53
	>10cm	25	23.5
	Unknown	25	23.5
Serum LDH	Normal	74	70
	Elevated	32	30
Histology (IWF)	Intermediate	91	86
	High (excl lymphoblastic)	15	14

Table 2
EXTRANODAL SITES

Site	Number	Percentage
Gastrointestinal	34	32
Thyroid	16	15.1
Soft Tissue	6	5.7
Head and Neck	44	41.5
Others	5	4.8
Bone	1	0.9
TOTAL	**106**	**100**

Table 3
PRESCRIBED TREATMENTS

Treatment	Number	Percentage
Radiation	20	19
Chemotherapy	74	70
Radiation/Chemotherapy	12	11
TOTAL	**106**	**100**

Table 4
COMPLETE REMISSION AND SURVIVAL RATES BY INDEX CATEGORY

IPI Category	Number	CR (%)	5 yr RFS(%)	5 yr OS(%)
Low	80	94	72	83
Low-Intermediate	13	100	53	65
Intermediate-High	13	70	32	41

Figure 1
OVERALL SURVIVAL BY INDEX
PRIMARY EXTRANODAL NHL

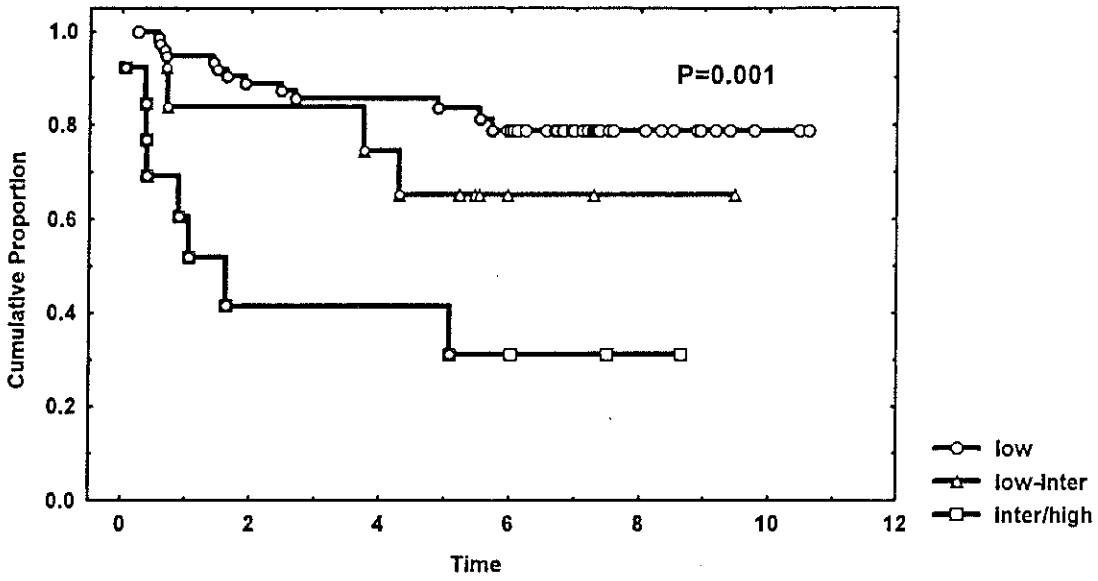
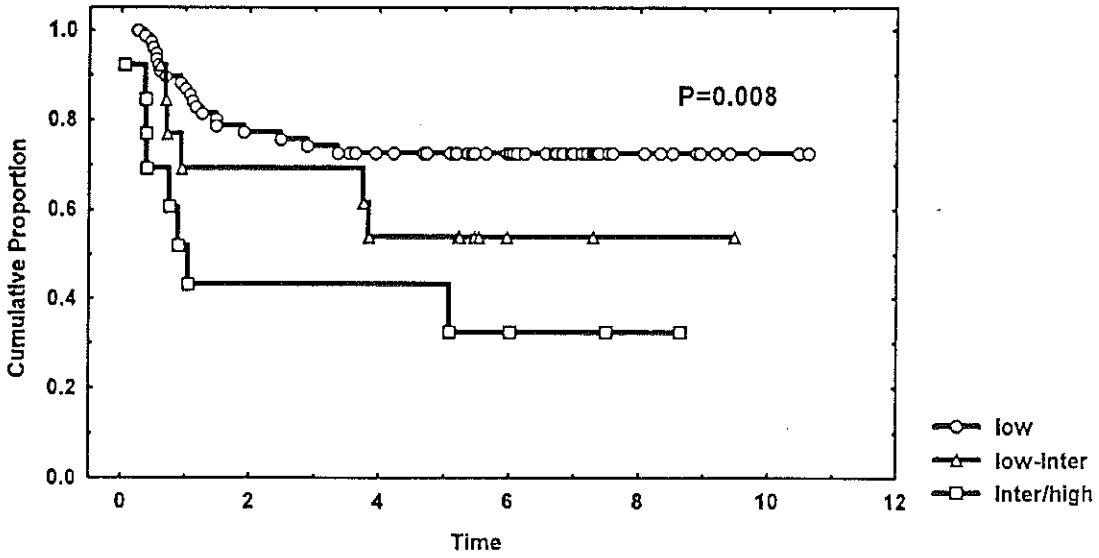


Figure 2
RELAPSE FREE SURVIVAL BY INDEX
PRIMARY EXTRANODAL NHL



APPENDIX A

1996 REQUESTS FOR TUMOR REGISTRY DATA

*Publication **KFSH&RC Presentation ***Outside KFSH&RC Presentation

January	
Adult Extraskeletal/Soft Tissue Osteosarcoma w/ Site, Stage, Treatment, Vital Status as of Last Date of Contact (MR Numbers) (1975-1995)	Dr. M. Raja
Breast Non-Hodgkin's Lymphoma (MR Numbers) (1975-present)	Dr. A. Ezzat
Pediatric Medulloblastoma Cases (MR Numbers) (Nov 1994-present)	Dr. M.Mustafa
Breast Cancer Cases w/ Mastectomy as Primary Treatment (MR Numbers) (1994-1995)	Dr. A. Ezzat
Breast Cancer Cases w/ Neoadjuvant FAC (MR Numbers) (1994-1995)	Dr. A. Ezzat
February	
Pediatric Acute Lymphoblastic Leukemia (MR Numbers) (1990-1995)	Dr. A. Al Nasser
Extranodal Head & Neck Non-Hodgkin's Lymphoma, Stages I & II, w/ Age, Sex, Site, B/A Symptoms, Treatment (MR Numbers)(1980-1994)	Dr. A. Ezzat
Pediatric Neuroblastoma Cases (MR Numbers) (1995-present)	Dr. M.Mustafa
Adult AML Cases w/ Treatment & Vital Status as of Last Contact Date (MR Numbers)(1981-1995)	Dr. E. Sahovic
1994 Malignant Cases by Site, Sex, Pediatrics vs All Cases	Ministry of Health
April	
Acute Myeloid Leukemia Cases (MR Numbers) (1994-1995)	Ms. R. Gumaer
May	
Metastatic Breast Cancer Cases w/ Date of Dx and Site/s of Metastasis (MR Numbers) (1975-1991)	Dr. A. Ezzat
Breast Cancer Cases with Disease Relapse, w/ Date of Relapse and Site/s of Relapse (MR Numbers)(1975-1991)	Dr. A. Ezzat
Adult Head & Neck Sarcoma Cases (MR Numbers) (1980-1990)*	Dr. A. Ezzat
100 Non-Hodgkin's Lymphoma Cases w/ At Least 5 Yrs Survival, w/ Site, Histology, Stage, Age at Dx and Treatment (MR Numbers)	Dr. A. Kandil
Pediatric Cases with Second Primaries, w/ Sites, Histologies, Age, Dates of Dx and Treatment (MR Numbers) (1993-1995)**	Dr. M. Mahr
Lung Cancer Cases by Age, Sex, Region, Histology, Smoking Hx & Shamma/Shisha Usage (1985-1994)	Ministry of Petroleum
Breast Medullary Cancer Cases (MR Numbers) (1975-1995)	Dr. A. Ezzat
June	
Childhood Cancer Cases by Histology and Sex (1975-1994)	D. M. Mustafa
Adult Hodgkin's Disease Cases (MR Numbers) (1992-present)*	Dr. S. Bazarbashi

Appendix A (cont'd)

Adult Germ Cell Tumor Cases (MR Numbers) (1992-present)*	Dr. S. Bazarbashi
Urinary Bladder Cancer Cases by Treatment and by Histology (1975-1994)**	Dr. S. Bazarbashi
Urinary Bladder Cancer Cases (Transitional Cell/ Squamous Cell) by T Staging (1992-1995)**	Dr. S. Bazarbashi
Non-Hodgkin's Lymphoma of the Colon, Rectum and Rectosigmoid, w/ all available information (MR Numbers) (1980-1995)*	Dr. A. Ezzat
Adult CNS Leukemia Cases, Pre-Treatment and Post-BMT (Last 10 years)	Dr. J. Chacko
July	
Ovarian Cancer Cases w/ Age, Histology, Stage (MR Numbers) (1975-1995)	Dr. A. Ezzat
Esophageal Squamous Cell Carcinoma Cases by the Clinical TNM Stage (1992-1995)	Dr. S. Bazarbashi
August	
Pediatric B-Cell Acute Lymphoblastic Leukemia (MR Numbers) (1991-present)	Dr. M.Mustafa
Pediatric Medulloblastoma Cases w/ Date of Dx (MR Numbers) (1994-present)	Dr. M. Mustafa
T4 Nasopharyngeal Cancer Cases (MR Numbers) (1990-1995)	Dr. A. Al Amro
Pediatric Stage IV Hodgkin's Disease w/ Date of Dx and Date of Relapse (1990-present)	Dr. M. Mustafa
Retinoblastoma Cases by Year and Laterality (MR Numbers) (1976-1984)*	Dr. A. Gray
Liposarcoma Cases w/ Stage and Treatment (MR Numbers) (1985-1996)	Dr. W. Mourad
September	
Pediatric Acute Myeloid Leukemia (MR Numbers) (1981-1996)	Dr. H. El Solh
1995 Malignant Cases by Site, Sex, Pediatrics vs All Cases	Ministry of Health
October	
Breast Cancer Cases vs Total Cancer Cases (1975-August 1996)	Dr. M. Vora
Pediatric Germ Cell Tumor Cases w/ Age, Sex, Site, Histology, Date of Dx, Stage and Treatment (MR Numbers) (1975-1996)	Dr. I. Fawaz
November	
Squamous Cell Carcinoma of the Extremities (MR Numbers) (1976-1995)*	Dr. H. Schultz

APPENDIX B

1996 Tumor Committee Members

William Allard, D.M.D.	Dentistry
Hamad Al Daig	CHIC
Saud Al Dossary	Media Affairs
Rita Anderson	Nursing
Shouki Bazarbashi, M.D.*	Medical Oncology
Edward De Vol, Ph.D.	BS&SC Research Centre
Poul Eriksen, M.D.	Obstetrics and Gynecology
Adnan Ezzat, M.D.	Medical Oncology
Mohd Hannan, Ph.D.	B&MR Research Centre
Stig Ingemansson, M.D.	Surgery
Justin Martin, M.D.**	Pathology
Peter McArthur, M.D.	Surgery
Dolores K. Michels-Harper, C.T.R.	Tumor Registry
Lamia NouNou	Social Services
Assem Rostom, M.D.	Radiation Oncology
Rajeh Sabbah, M.D.***	Chairman, Oncology
Jens O. Sieck, M.D.	Medicine
Ofelia B. Te, C.T.R.	Tumor Registry
Beth Ann Tomasek***	Quality Assurance
Edward Wiebe, M.D.	Radiology
Ferdinand Zwaan, M.D.	Hematology/Oncology

* Chairman
** Deputy Chairman
*** Ad hoc Members

APPENDIX C

SUMMARY OF CASES PRESENTED
TUMOR BOARD - 1996

SITE	NO.
Lymphatic System	
Non-Hodgkin's Lymphoma	1
Hodgkin's Disease	2
Brain	3
Breast	2
Liver	1
Ovary	1
Testis	1
Orbit	1
Unknown Primary w/ Metastasis	1
Metastatic Tumor to Palate	1
Neck Tumor	1
Mediastinal Lymphangioma	1
Spinal Cord Compression	1

Tumor Board Coordinator: Dr. Shouki Bazarbashi

APPENDIX D

1996 SUMMARY OF ONCOLOGY GRAND ROUNDS TOPICS

09 Jan	The Danish Breast Cancer Co-operative Group (DBCG)	Dr. H. Schultz
16 Jan	BMT in Children: KFSH&RC Experience and Future Directions	Dr. H. El Solh
12 Mar	BMT in Patients with Chronic Myeloid Leukemia	Dr. N. Chaudhri
26 Mar	Dose Intensive High Dose Chemotherapy with Autologous Bone Marrow and Stem Cell Transplantation in Breast Cancer Patients	Dr. H. Upadhyaya
09 Apr	Histiocytic Disorders of Children	Dr. K. McClain
14 May	Psychoneuro Immunology: The Bone Marrow Transplant Model	Dr. A. Sullivan
28 May	Clinical Pathways	Ms. J. Al Dihan
11 June	Fanconi's Anemia "From Care ... To Cure"	Dr. M. Ayas
25 June	Intravesical Therapy: Does It Affect The Natural History of Superficial Bladder Cancer?	Dr. S. Bazarbashi
09 July	Stereotactic Radiosurgery	Dr. A. Al Amro
23 July	The Measurement of Prostatic Specific Membrane Antigen - A New Prognostic Marker	Dr. G. Murphy
24 Sept	Aplastic Anemia: Results of Immuno-suppressive Treatment & Bone Marrow Transplant	Dr. F. Zwaan
08 Oct	Molecular Monitoring of Bone Marrow Engraftment in the Allogeneic Setting	Dr. M. Gyger
12 Nov	Unproven Cancer Treatments - A North American Experience	Dr. M. Brigden
10 Dec	Drug and Radiation Interaction	Dr. Y. Khafaga
24 Dec	Secondary Malignancy in Childhood	Dr. M. Al Mahr

Oncology Grand Rounds Coordinator: Dr. Ferdinand Zwaan

V. GLOSSARY OF TERMS

Accessioned: Patients are entered into the Tumor Registry by the year in which they were first seen at KFSH&RC for each primary cancer.

Age of Patient: Recorded in completed years at the time of diagnosis.

Analytic Cases: Cases which were first diagnosed and/or received all or part of their first course of treatment at KFSH&RC.

Non-Analytic Cases: Cases diagnosed elsewhere and received all of their first course of treatment elsewhere.

Case: A diagnosis or finished abstract. A patient who has more than one primary is reported as multiple cases.

Crude Relative Frequency: The proportion of a given cancer in relation to all cases in a clinical or pathological series.

First Course of Treatment: The initial tumor-directed treatment or series of treatments, usually initiated within four months after diagnosis.

Stage of Disease: Determined at the time of the first course of treatment.

SEER (Surveillance, Epidemiology and End Results) Summary Staging:

In Situ: Tumor meets all microscopic criteria for malignancy except invasion.

Local: Tumor is confined to organ of origin.

Regional: Tumor has spread by direct extension to immediately adjacent organs and/or lymph nodes and appears to have spread no further.

Distant: Tumor has spread beyond immediately adjacent organs or tissues by direct extension and/or has either developed secondary or metastatic tumors, metastasized to distant lymph nodes or has been determined to be systemic in origin.

AJCC (American Joint Committee on Cancer) TNM Staging: A classification scheme based on the premise that cancers of similar histology or site or origin share similar patterns of growth and extension.

T+N+M = Stage

T: Extent of primary tumor

N: Extent of regional lymph node involvement

M: Distant Metastasis

Clinical Stage: Classification based on the evidence acquired before treatment. Such evidence arises from physical examination, imaging, endoscopy, biopsy, surgical exploration and other relevant findings.

Pathologic Stage: Classification based on the evidence acquired before treatment, supplemented or modified by the additional evidence acquired from surgery and from pathologic examination of the resected specimen.