



**REGIONAL
CANCER
CENTRE**

THIRUVANANTHAPURAM

1997-98

REGIONAL CANCER CENTRE

THIRUVANANTHAPURAM-695 011, KERALA, INDIA

REPORT OF ACTIVITIES 1997-98

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CONTENTS

I.	Introduction	1
II.	Departmental Activities	4
	1. Division of Radiotherapy	4
	2. " Surgical Oncology	9
	3. " Paediatric Oncology	16
	4. " Medical Oncology	18
	5. " Dental Care	20
	6. " Clinical Services & Medical Records	23
	7. " Nursing Services	28
	8. " Pharmaceutical Services	31
	9. " Pain & Palliative Care	33
	10. " Blood Bank	34
	11. " Cytopathology	35
	12. " Imageology	41
	13. " Nuclear Medicine	42
	14. " Radiation Physics	44
	15. " Cancer Epidemiology & Clinical Research	52
	16. " Research	68
	17. " Laboratory Medicine & Tumour Biology	84
	18. " Clinical Laboratory	89
	19. " Information Systems	92
	20. " Community Oncology	94
	21. " E.C.D.C., Ernakulam	106
	22. " E.C.D.C., Palakkad	114
	23. " Library & Information Services	118
III.	Conferences/Seminars/Trainings/Workshops attended by staff	121
IV.	Papers Presented in Conferences etc.	132
V.	Papers Published	138
VI.	Administration	151
	1. Members of the Governing Body	151
	2. Members of the Executive Committee	152
	3. Members of the Building Committee	153
	4. Major decisions of the Executive Committee	153
VII.	Engineering Department	155
VIII.	List of Staff	155
IX.	Acknowledgement	167
X.	Accounts	169



Scientists of the Japanese Research Foundation with Hon. Chief Minister of Kerala
(L to R) Dr. N. Sreedevi Amma, Dr. Morishima, Dr. Kato, Sri. E.K. Nayanar and Dr. Akiba.

INTRODUCTION

The Regional Cancer Centre, Trivandrum having entered into its 17th year of existence, it would be in the fitness of things to take stock of its achievements and to assess how far it has succeeded in fulfilling its objectives, the major ones of which are *clinical services, cancer control activities and clinical and fundamental research.*

In 1982 the number of new patients registered was 3626 whereas in 1997 the number rose to 8976. This 150% increase in the number can be attributed to the good quality of treatment rendered as well as the high standard of diagnostic services. The treatment protocols have been updated consistent with the latest trends in oncology. We have newly added a High Dose Rate (HDR) (Brachytherapy) unit and a Modern Radiotherapy Simulator will be commissioned soon. Rapid strides were made in the physical facilities as well. The hospital now has 300 inpatient beds, 20 day care beds, 44 paediatric ward beds and 15 beds for palliative care. When surgical block is fully equipped the centre will be having eight fullfledged surgical theatres. A modern Endoscopy unit has become functional recently. The overall treatment results are very satisfactory and comparable with those in developed countries. This is one of the few centres where more than 52% of patients are getting free treatment.

We are also rendering valuable clinical services to other categories of patients referred from medical college, Trivandrum and other hospitals by way of the utilisation of the modern facilities of our Clinical laboratory, Cytopathology, Nuclear medicine, Cytogenetic and Imageology divisions.

This centre was the first to start a Community Oncology division and we function as the apex organisation for the cancer control activities of the state. This centre conducts cancer control programmes throughout the State by way of cancer screening camps, public and professional education and organising early cancer detection centres. Thus we are motivating several non-governmental organisations to involve themselves in cancer control programmes. The village level comprehensive cancer control programme of the Malabar Cancer Society at Kannur is a very good example. The effort to establish similar programmes at Pathanamthitta and Kollam is on the anvil. The Early Cancer Detection Centres at Palakkad, Ernakulam, Karunagappally and Trivandrum are very useful to the people there. The activities of the District Cancer Control Programme at Ernakulam are well appreciated at national and international levels.

The follow-up clinics conducted at Karunagappally and Emakulam as outreach programmes of the Regional cancer Centre are of immense help to the patients of these zones.

In recognition of our community outreach activities and research, WHO has declared Regional Cancer Centre as a *Collaborating centre for cancer control in developing countries*.

From the very inception this centre has been giving paramount importance to research activities. In the areas of applied and fundamental research, studies are ongoing in immunohistogenesis, cytogenetics, familial cancers, cell and molecular biology, radiobiology, etc. We have several clinical research programmes including study of prognostic markers, survival analysis using protocols and international collaborative research programmes. At present we are conducting 51 research projects supported by several national and international agencies and financed to the tune of above Rs. 1.2 crores. Within this short span nearly 600 scientific papers were generated from this centre of which many were published in international journals. Some of our staff are either authors or co-authors of books pertaining to oncology. "Radiotherapy in Cancer Management" - a practical manual is a WHO publication edited jointly by Dr.M Krishnan Nair and Dr. Carl F Von Essen.

Three community research projects covering large population groups have been a unique feature of our outreach programme. The Natural Background Radiation study supported by Dept. of Atomic Energy till the end of March, 1998 at Karunagappally has attracted the attention of International Scientific community particularly of the Japanese Research Foundation and also the International study group on High Natural Radiation. In this study a population of about 3,50,000 has been enlisted. A Population Cancer Registry has also been organised in this rural area. In another study 5000 women from Kazhakkuttom village near Trivandrum are being screened to assess the prevalence of Human Pappilloma Virus infection in the community and their potential for malignant transformation. This is supported by the Institute of Cancer Research in Sutton, UK. A screening programme on oral cancer at Mangalapuram near Trivandrum with the assistance of the International Agency for Research on Cancer (WHO) Lyon is in progress. Out of a 900000 enumerated population 60000 people are included in the study group. Appropriate intervention is an integral component of this study.

The three cancer registries organised by the Regional Cancer Centre are unique and have received wide acclaim, fulfilling the objectives

of cancer control programmes. These are the Hospital Cancer Registry, Trivandrum, the Population Based Cancer Registry, Karunagappally and the Population Based Cancer Registry, Trivandrum

No institution however well planned can achieve excellence and sustained eminence unless there is a conducive academic and research setting. These activities taken up by the RCC have been a continuous feature since inception and have received recognition internationally. The teaching activities include Cytotechnologists/ Cytotechnician courses, Radiological assistant's course, DMRT, MD in Radiotherapy and PhD. So far 25 DMRT, 28 MD and 20 PhD have been awarded. Twenty one PhD students are currently in our rolls. This centre is also imparting teaching and training to the undergraduate and postgraduate students of the medical college, Trivandrum. The facilities available in our modern library are being fruitfully utilised by the academic forum of the University departments and the Trivandrum Medical college also. The RCC has been approved by several universities for carrying out doctoral and post doctoral researches.

This centre has also played a pivotal role in preparing and formulating projects for starting cancer centres at Ernakulam, Kozhikode and Thalassery.

Despite several constraints the RCC has grown up as a centre of excellence, mainly due to the unstinted co-operation of the state and the central government and several international agencies. In this connection we wish to express our gratitude to Dr. P.K. Iyengar former Chairman of the Department of Atomic Energy and the present Chairman Dr. R. Chidambaram for the immense support rendered to us which went a long way in modernising this centre.

This report contains the activities of the various divisions and the audited statement of accounts for the year 1997-98.

DEPARTMENTAL ACTIVITIES

DIVISION OF RADIOTHERAPY

Dr. M. Krishnan Nair	Director & Professor
Dr. F. Joseph	Dy. Director & Professor
Dr. B. Rajan	Professor
Dr. T. Gangadevi	Addl. Professor
Dr. P.G. Jayaprakash	Addl. Professor
Dr. C.S. Rafeeka Beegum	Addl. Professor
Dr. Suresh Chandra Dutt	Assoc. Professor
Dr. S. Parameswaran	Assoc. Professor
Dr. V. Narayana Bhattathiri	Assoc. Professor
Dr. Jayaprakash Madhavan	Assoc. Professor
Dr. K. Ramadas	Assoc. Professor
Dr. Thomas Koilparambil	Assoc. Professor
Dr. Francis V. James	Assoc. Professor
Dr. K. Ratheesan	Assoc. Professor
Dr. Ajithkumar	Lecturer
Dr. Beela Sarah Mathew	Lecturer

The division of Radiotherapy is responsible for the primary care of cancer patients attending Regional Cancer Centre. It functions as 3 units with 16 Radiotherapists. As the patient management involves multidisciplinary management with Radiotherapy, Surgery and Chemotherapy, regular clinics of different divisions are being conducted. In association with various departments of Medical College, the following clinics are also conducted. Paediatric tumour board (weekly), Gynaecological tumour board (monthly), Gastroenterology tumour board (monthly), Surgery tumour board (monthly) and Clinico-Pathological Conference (monthly). The staff are also actively involved in conducting clinics at peripheral centres at Ernakulam and Karunagappally for regular follow-up of patients.

Clinical Activities

The division has taken the responsibility of 8963 new cancer patients registered at Regional Cancer Centre during 1997-98. During this period there were 96097 review cases. Out of 6604 hospital admissions, 3292 were under the care of the Radiotherapy department. Teletherapy was used in 6072 patients. Brachytherapy was employed in 514 patients.

A new high dose rate microselectron was installed in January, 1998 especially for treating gynaec and oesophageal cancers.

<u>Split up of Brachytherapy</u>	<u>Number</u>
Selectron (for gynaec tumours)	- 303
Manual afterloading Caesium (for gynaec tumours)	- 80
HDR Microselectron for Gyn. Tumour	- 18
Intracavitary Radiotherapy for Oesophagus	- 33
Interstitial implants	- 88
Surface mould treatments	- 10

Academic Programmes

This division functions as undergraduate and postgraduate training centre for Medical College, Trivandrum. List of Postgraduate students:

Dr. Sivanandan
 Dr. Sharmila Mary Joseph
 Dr. Reghuthaman
 Dr. Ramachandran
 Dr. Sajeed

There were regular weekly journal clubs. 15 guest lectures were conducted by overseas faculties. Training for house surgeons, nursing students and other paramedical staff was continued.

Awards

1. **Dr. M. Krishnan Nair** was awarded the 'Chikilsa Retnam Award' 1998 by Dhanwantari Trust and Elankath Smaraka Trust Award' 1998 by Elankath Smaraka Trust.
2. **Dr. V. N. Bhattathiri** was awarded the Dr. Vasudev Prize for the best research project of 1992, instituted by Science & Technology Department of Govt. of Kerala.
3. **Dr. Beela Sarah Mathew** was awarded the fellowship of Hans Wyder Foundation for attending ESO sponsored advanced course "Radiotherapy 2000-clinical and pre clinical strategies" at Switzerland, Dec. 1997.

Ongoing Research Projects

The list of ongoing clinical research trials is given below :

1. **Randomised trial of Radiotherapy + Mitomycin C in locally advanced head and neck cancers.**
(Funding agency: International Atomic Energy (IAEA), Australia)
Principal Investigator Dr. M. Krishnan Nair
Co-Investigators Dr. K. Ramadas, Dr. V.N. Bhattathiri
Dr. K. Ratheesan
2. **Randomised trial of Radiotherapy + Concurrent Interferon in carcinoma of nasopharynx.**
(Funding agency: Fulford (School) India Ltd.)
Principal Investigator Dr. M. Krishnan Nair
Co-Investigators Dr. V.N. Bhattathiri, Dr. K. Ramadas
Dr. K. Ratheesan
3. **Radical radiotherapy + Interferon for advanced buccal cancers.**
Principal Investigator Dr. K. Ramadas
Co-Investigators Dr. B. Rajan, Dr. Beela Sarah Mathew
Dr. F. Joseph
4. **Toroxifene for metastatic breast cancer.**
(Funding agency: M/S Pfizer Ltd. Mumbai)
Principal Investigator Dr. M. Krishnan Nair
Co-Investigators Dr. K. Ratheesan, Dr. N. Geetha
Dr. Cherian Varghese,
Dr. K. Sasidharan
5. **Radiosensitivity prediction by serial cytology in oral cancers.**
(Funding agency: STEC, TVM)
Principal Investigator Dr. V.N. Bhattathiri
6. **ATLAS - Adjuvant Tamoxifen in Breast Cancer - Longer gainst shorter Randomized clinical trial in collaboration with clinical trials unit, Oxford, U.K.**
(Funding agency: ATLAS-Clinical Trial Services Unit, Oxford, UK.)
Principal Investigator Dr. B. Rajan
7. **Gemcitabine Vs. Epirubicin in elderly patients with metastatic breast cancer- a randomized clinical trial.**
(Funding agency: M/S Eli Lilly Ranboxy Ltd., New Delhi.)
Principal Investigator Dr. B. Rajan
Co-Investigators Dr. Rafeeka Beegum,
Dr. Beela Sarah Mathew
8. **A multicentre randomised double blind study of Idoxifene 40mg day Vs Tamoxifen 20mg/day as first line hormonal therapy of metastatic breast cancer in post menopausal women.**
(Funding agency: Smithkline Beecham Health Care Ltd.)
Principal Investigator Dr. M. Krishnan Nair
Co-Investigators Dr. S. Parameswaran, Dr. N. Geetha
9. **Evaluation of the chemopreventive potential of Vit.A in the prevention of recurrence and second primaries in head and neck cancer.**
(Funding agency: IARC, WHO, France.)
Principal Investigator Dr. K. Ramadas
Co-Investigators Dr. Beela Sarah Mathew, Dr. Aswin
Dr. F. Joseph, Dr. M. Krishnan Nair
10. **Phase III comprehensive study of combination treatment with TLCB-99 Liposomal Doxorubicin and Cyclophosphamide Vs Doxorubicin and Cyclophosphamide in metastatic breast cancer.**
(Funding agency: Liposome Company Inc. USA
Quintiles Spectral (India) Ltd, Ahmedabad)
Principal Investigators Dr. M. Krishnan Nair
Co-Investigator Dr. Jayaprakash Madhavan
Other study personnel Dr. Cherian Varghese, Dr. N. Geetha,
Dr. Francis V. James, Dr. V. Pradeep

Dr. K. Ramachandran
 Dr. George Koshy-Asst.
 Prof. of Cardiology, MCH, TVM

11. Radiosensitivity treatment outcome and ras gene mutation in Ca. Rectum

(Funding agency: Dept. of Atomic Energy (DAE), Mumbai)

Principal Investigator Dr. Jayaprakash Madhavan

The department also co-operated with various studies by other divisions in Regional Cancer Centre and departments in Medical Colleges.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF SURGICAL ONCOLOGY

Dr. Paul Sebastian	- Assoc. Professor (on leave)
Dr. M. Iqbal Ahamed	- Assoc. Professor
Dr. K. Chitrathara	- Asst. Professor (on deputation leave)
Dr. Jem Prabhakar	- Asst. Professor
Dr. Cherian Koshy	- Asst. Professor
Dr. Namrata Dhakkad	- Asst. Professor
Dr. Manoj Pandey	- Lecturer
Dr. Shaji Thomas	- Lecturer

Anaesthesiology

Dr. Gladys Jeevy	- Assoc. Professor
Dr. Rachel Cherian Koshy	- Asst. Professor
Dr. Mary Thomas	- Lecturer

The paucity of experienced staff, particularly surgeons, continued during the reporting year, although two new doctors, Dr. Namratha Dhakkad as Assistant Professor and Dr. Shaji Thomas as Lecturer joined service in the surgical oncology division. However, the operative work carried out remained comparable to the previous years, and the academic activities in terms of number of publications and presentations and newer research projects undertaken have shown an increase during the period.

During the reporting year, a total of 590 patients were operated (Table 1) under general anaesthesia, which included 18 palliative ostomies. Also, 366 minor procedures including diagnostic D & C in fifteen patients under short anaesthesia, and 245 endoscopic procedures were performed. The endoscopic procedures include flexible nasopharyngolaryngoscopy, cystoscopy, rigid sigmoidoscopy and colposcopy.

TABLE - 1

Major operations	-	572
Palliative Ostomies	-	18
Minor procedures	-	366
Endoscopic procedures	-	<u>245</u>
Total	-	<u>1201</u>

A new division of endoscopy has been formed towards the latter half of the reporting year, and since then such procedures are being carried out by the above division.

As in the previous years, head and neck malignancies including thyroid cancers constituted more than half of the operative work (55%) (Table 2)

TABLE - 2

Region wise distribution of major operations

Region	No.	Percent
Head & Neck	317	55.5
Breast	109	19.1
Genito urinary	34	11.2
Bone and soft tissue	37	6.5
Gastrointestinal & Retroperitoneal	29	4.9
Skin including malign. melanoma	16	2.8
Total	572	100.0

In the head and neck area, oral cancer formed the major site of disease (64%) (Table-3) and unlike in the previous years, there was an increase in the number of patients with carcinoma tongue being treated with surgery (37.2%). There is a trend in the recent years that surgery is often considered as the primary modality of treatment in tongue cancers which is followed by radiation therapy depending on the stage of disease and extent of surgical margins. The lesions were often locally advanced with regional node involvement and required primary reconstruction (61/118) the most commonly used flaps in this area being pectoralis major myocutaneous flap (54/61).

TABLE - 3

Site wise distribution of Head and Neck cancers

Site	No.	Percent
Tongue	118	37.2
Buccal Mucosa	86	27.1
Thyroid	35	11.1
Metastatic neck node	23	7.3
Lower Alveolus	18	5.7
Salivary tumours	10	3.1
Paranasal sinus	10	3.1
Larynx and pharynx	8	2.5
Lip	5	1.6
Skin	4	1.3
Total	258	100.0

Majority of the buccal mucosa lesions were either radioresistant or recurrent diseases and salvage surgery in these patients often necessitated primary reconstruction. Seventy two such patients required reconstruction and two flaps each were used in twenty one patients. Surgery as the primary modality of treatment was considered only in

these patients with locoregionally advanced disease with skin involvement and/or metastatic node disease. A total of 178 flaps were used in 154 patients for reconstruction in head and neck region, 24 patients requiring two flaps each. The different flaps used is given in Table 4.

TABLE - 4

Flaps used for reconstruction in Head and Neck region

Flap	Number
Pectoralis major myocutaneous flap	134
Deltopectoral flap	32
Nasolabial flap	5
Sternomastoid myocutaneous flap	3
Latissimus dorsi myocutaneous flap	2
Platysma myocutaneous flap	1
Forehead	1
Total	178

Modified radical mastectomy and Patey's mastectomy were the commonest procedures performed in breast cancer and breast Conservation was carried out in nearly 10% of patients. Frozen section facility was often used in this situation.

There was a decline in the number of patients with gastrointestinal and genitourinary malignancies treated in the division (Table 5)

TABLE - 5

Site wise distribution of gastrointestinal and genito-urinary cancers.

Site	Number
Stomach & Oesophagus	5
Colorectum	12
Retroperitoneum	5
Bladder	1
Ovary	18
Cervix & uterus	29
Vulva & vagina	2
Penis	6
Prostate	2
Others	13
Total	93

However, there was an increase in the number of patients with ostomies, both as a result of certain curative resection and as a palliative measure. Many of these patients come to the follow-up clinic with

problems related to stoma which prompted the need to start a stoma care clinic. In this context a staff nurse trained in the theatre was deputed for three months training in stoma care at Tata Memorial Hospital, Bombay. It is proposed to start a stoma care clinic in association with this division.

Bone and soft tissue tumours constituted 6.5% of total number of cases. Bone tumours were almost always treated by amputation or disarticulation. However, in soft tissue sarcomas of the extremities, a planned limb salvage surgery could be carried out in majority of patients.

Anaesthesiology Section

During the reporting period two anaesthetists were managing the two operation tables for 8 months and another anaesthetist joined service since November 1997.

604 patients were given anaesthesia during this period, of which 28 cases were for emergency surgery.

TABLE - 1

Age group	Percentage
12 - 30 years	15%
31 - 50 years	30%
51 - 70 years	40%
71 - 80 years	15%

TABLE - 2

Duration of Anaesthesia	Percentage
2 - 3 hours	25%
3 - 5 hours	50%
5 - 7 hours	25%

TABLE - 3

Type of anaesthesia	Number
General anaesthesia	590
Spinal	14
GA + Epidural (for post - op pain management)	31
Awake blind nasal intubation	58
Fiberoptic intubation	18
Elective tracheostomy	14

Difficult airways were managed by the awake blind nasal intubation and fiberoptic intubation. No pre-op tracheostomy was done in any of the cases.

TABLE - 4

Patients with other systemic diseases	Number
Hypertension	168
Diabetes Mellitus	106
Heart disease	61
Respiratory disease	82

These patients were treated to optimum condition before taking up for anaesthesia.

Academic Activities

Post graduate students in General surgery from Medical College, Trivandrum and in Oral and Maxillofacial surgery from Dental College, Trivandrum and from A.B Shetty Dental College, Mangalore, had regular postings in this division.

Intra divisional journals clubs and symposia were conducted regularly.

Research projects

- Pesticide exposure of pesticides and risk of breast cancer.**
(Funding agency: Environmental Epidemiology branch, National Cancer Institute, USA)
Supervisor Dr. Iqbal Ahamed
- Population based screening for oral premalignant lesions through inspection and oral examination.**
(Funding agency: IARC, Lyon, France.)
Co-investigators Dr. M. Iqbal Ahamed
Dr. Manoj Pandey
- Evaluation of oral visual inspection in the control of oral cancer.**
(Funding agency: IARC, Lyon, France.)
Co-investigators Dr. M. Iqbal Ahamed
Dr. Manoj Pandey
- Evaluation of Chemoprevention of oral cancer with long term administration of vitamin A in subjects at high risk.**
(Funding agency: IARC, Lyon, France)
Co-investigators Dr. M. Iqbal Ahamed
Dr. Manoj Pandey

5. **Trivandrum Rural Cohort on tobacco related mortality (TRM)**
(Funding agency: IARC, Lyon, France.)

Co-investigators
Dr. M Iqbal Ahamed
Dr. Manoj Pandey

6. **Case-control study of gall bladder cancer.**

(Funding agency: IARC, Lyon, France.)

Co-investigator
Dr. Manoj Pandey

7. **Trivandrum quality of life study** (Pilot project completed)

Principal Investigator
Dr. Manoj Pandey

Co-investigators
Dr. Ramadas K,
Dr. Aleyamma Mathew,
Ms. Latha PT.

8. **Psycho-social and vocational rehabilitation of cancer survivors**

(Funding agency: Centre for Development studies, Trivandrum)

Principal Investigator
Dr. M. Iqbal ahamed

9. **Evaluation of chemoprevention of second primary in patients with head and neck cancer with administration of vitamin A.**

(Funding agency: IARC, Lyon, France.)

Co-investigator
Dr. Manoj Pandey

Awards, Fellowships & Training Programmes

1. **Dr. Manoj Pandey**

a) has selected to be included in the 16th edition of 'who's who' in the world published by Marguis, USA.

b) Listing on 'Indian Science resource data base' prepared by ICMR New Delhi.

c) Listing on the resource database of National Library of Medicine USA.

2. **Dr. K. Chlathara** has been selected for MCH training in urology at Medical College Hospital, Trivandrum.

3. **Dr. Jem Prabhakar** has been awarded research fellowship in Photodynamic Therapy at National Medical Laser Centre, Rayne institute University College Hospital, London.

Post Graduate Thesis

Dr. M. Iqbal Ahamed co-supervisor of thesis "Effectiveness of a structured instructional programme on selected self care activities leading to physical rehabilitation of patients undergoing surgery for head and neck cancers" - submitted by S. Prasanna for the degree of MSc nursing to the University of Kerala 1998.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF PAEDIATRIC ONCOLOGY

Dr. P. Kusumakumary

- Assoc. Professor

Dr. T. Priyakumary

- Lecturer

This division is responsible for the primary care of all the patients up to the age of 14 years registered in this centre.

Clinical Activities

Paediatric Oncology out patient service functions on a referral basis six days a week. New patients registered this year is nearly the same as compared to the previous year. The pattern of paediatric malignancies reported this year is given below.

	Number	Percentage
Acute Lymphatic Leukaemia	- 112	28.3
Acute Myeloid Leukaemia	- 25	6.3
Chronic Myeloid Leukaemia	- 5	1.3
Brain tumours	- 60	15.2
Lymphomas	- 28	7.1
Soft tissue Sarcomas	- 24	6.1
Neuroblastomas	- 20	5.1
Wilm's Tumour	- 13	3.3
Bone Tumours	- 18	4.5
Retinoblastoma	- 13	3.3
Germ cell Tumours	- 12	3.0
Histiocytosis	- 11	2.8
Miscellaneous	- 20	5.1
Non malignant	- 35	8.8
Total number of new patients	- 396	100.0
No. of out patient visits	- 8726	
No. of in patients	- 526	

As in the previous years the most common malignancy reported was acute leukaemias.

All new patients underwent detailed diagnostic work up and appropriate treatment. Paediatric tumour board, consisting of Paediatric Oncologist, Paediatric Surgeon, Pathologist and Radiation Oncologist met every Monday and major management decisions were taken by this team as in previous years.



Play Room for Cheering up the patients of the Children's ward.

Academic & Research activities

This division actively participated in the teaching and training programme of under graduates and post graduates of Medical College, Trivandrum.

Organized one day CME Programme for the Paediatrician on 06-01-1998 including 7 International faculties.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF MEDICAL ONCOLOGY

Dr. V.P. Gangadharan	- Assoc. Professor
Dr. N. Geetha	- Asst. Professor
Dr. B.M. Hussain	- Lecturer (on leave)

This division is primarily responsible for the diagnosis and management of haematological, lympho reticular malignancies and solid tumours, where intensive chemotherapy is needed. Procedures like bone marrow aspiration, biopsy, liver biopsy, lumbar puncture and pleural aspirations etc. are being done as outpatient procedure. Nearly 120 new cases are being attended in this division. This division has to credit good treatment results even comparable with those in advanced countries.

Teaching

Besides the students of this centre, Post graduate students of the Medical College are given training and guidance by this division. Teaching sessions include case discussion, seminars, journal clubs. Diagnosis and management of haematological malignancies and the current trends in the management of all medical oncology problems were taught to them as well as to house surgeons etc.

Training and teaching were imparted to other categories like nurses, nursing assistants etc. Dr. V.P. Gangadharan gave periodic lectures on the MEDISAT programmes in Medical College, Trivandrum.

Fellowship

Dr. V.P. Gangadharan was awarded a WHO fellowship in bone marrow transplantation at Royal Marsden Hospital, Sutton, UK, April - June 1997.

Research projects

1. Gemcitabine in non small cell lung cancer (as part of global trial)
Investigator Dr. V.P. Gangadharan
2. GM-CSF as an adjunct in the induction treatment of Acute Myeloid Leukaemia
3. Cytogenetic response of CML to Interferon. α 2b
Investigator Dr. V.P. Gangadharan

A randomized trial of droloxiteac and tamoxifen in metastatic breast cancer.

(Funding agency: M/S Pfizer Ltd., Mumbai)

Co-investigator Dr. N. Geetha

Phase III comprehensive study of combination treatment with TCCD99 Liposomal Doxorubin and Cyclophosphamide vs Doxorubin and Cyclophosphamide in metastatic breast cancer

Co-investigator Dr. N. Geetha

A multicentre randomized double blind study of Idoxifene 40mg/day vs Tamoxifen 20mg/day as first line normal therapy of metastatic breast cancer in post menopausal women.

(Funding agency: Smithkline Beecham Health Care Ltd.)

Co-investigator Dr. N. Geetha

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF DENTAL CARE

Dr. Nailna Kumari, K.R - Lecturer

The division provides facilities for extraction, and biopsy for cancer patients, pre and post radiation care of teeth, maxillofacial prosthesis etc. Preparation of bite blocks and mould are also undertaken. The Dental Clinic works on all days of the week except Sundays. Patients are referred to the division of Dental Care by the Radiotherapy Department for required treatment.

The following are the highlights of activities :

- Minor operations for biopsies
- Dental extractions
- Preparation of mould
- Preparation of maxillofacial prosthesis
- Preparation of bite blocks
- Management of precancerous and other oral lesions
- Pre and Post radiation care of teeth

TABLE -1

Services rendered during the last 3 years

	1995-96	1996-97	1997-98
Total No. of cases attended	3809	2869	4295
New cases attended	751	419	904
Total No. of teeth extracted	NA	4882	5095
No. of Biopsies taken	522	418	759
No of biteblocks and moulds prepared	179	127	218
Pre and Post radiation care cases (Started in 1996-97)	--	38	142

There was substantial increase in the number of patients attended in the division.

TABLE -2

Site-wise distribution of biopsies done in 1997-98

Site of biopsy	No.	Percentage
Right Buccal Mucosa	103	17.34
Left Buccal Mucosa	123	20.70
Right Commissure	20	3.37
Left Commissure	24	4.04
Hard palate	22	3.70
Soft palate	7	1.17
Right retromolar region	15	2.53
Left retromolar region	8	1.35
Dorsum of tongue	33	5.56
Left border of tongue	51	8.59
Right border of tongue	35	5.90
Tip of tongue	3	0.50
Under surface of tongue	11	1.90
Floor of mouth	17	2.90
Left lower alveolus	33	5.60
Right lower alveolus	24	4.04
Left upper alveolus	9	1.50
Right upper alveolus	6	1.00
Left lower sulcus	10	1.70
Right lower sulcus	9	1.50
Left upper sulcus	4	0.70
Right upper sulcus	5	0.80
Lower lip	18	3.03
Upper lip	2	0.30
Right oropharynx	2	0.30
Total	594	100.0

Pre and Post Radiation Care of Teeth

It is found that post radiation cares of teeth is the main complication developing after the radiation treatment in patients who are suffering from cancer of the oral cavity, upper part of the oesophagus, lower part of the nasopharynx, maxillary sinuses, parotid gland etc. To avoid this, total extraction of teeth was usually resorted to such patients. It was in this context, that the division contemplated developing a preventive programme to tackle the problem of post radiation cares of teeth, sensitively etc. In young patients. This resulted in the introduction of

fluoride therapy for treating this condition.

The pre and post radiation treatment is recommended to cover following:

1. Oral prophylaxis
2. Conservative dental treatments
3. Preparation of vinyl fluoride carriers
4. Application of fluoride gel
5. A good dental follow-up programme

The number of patients who availed of the fluoride treatment has risen up to 142. Of these 110 persons had pre radiation treatment and 32 had only post radiation treatment. The former had no dental complaint.

Other Activities

1. Biteblocks and moulds were prepared for treatment of oral cancer patients in connection with their treatment with radiation and radium implantation.
2. Maxillofacial Prosthesis for correcting the deformities of the face after doing surgery in some cases of oral cancer.
3. For cases of Leucoplakia, SMF, Lichen planus etc. monthly check-up is conducted to assess the condition of patients who are under treatment.

Research Activities

This division rendered support to the Research Division at Radiotherapy department.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF CLINICAL SERVICES AND MEDICAL RECORDS

Mr. R. Raveendran Nair - Administrative Officer (Clinical Service)
Mr. V. Surendran Nair - Asst. Public Relations Officer.

The division continued all the activities under taken during the previous year. An overall 7% increase in the workload has been noticed as compared to previous year.

During this reporting period RCC has provided investigation and treatment free of charge to 52% of the total patients. The centre has spent Rs. 29,45,458/- for anti cancer drugs to poor patients.

TABLE 1.

Patient attendance during current and previous year

	Current year(1997)	Previous year
New cases registered	8953	8551
Review cases	96097	90126
- Radiation Oncology	73125	68554
- Surgical Oncology	3488	4334
- Medical Oncology	11758	11158
- Paediatric Oncology	7726	6070
Total patients (New & Old)	105060	98677
Daily average patient	350	329
Average attendance per patient	11.7	11
No of inpatient admission	6609	6063
- Radiation Oncology	3292	3738
- Surgical Oncology	732	745
- Medical Oncology	2059	1197
- Paediatric Oncology	526	383
Total appointment given	64142	56687
Attendance from appointment	55806 (87%)	48103 (84.8%)
Average length of stay	10	13
Hospital Deaths	398	409

In 1997, 28% of patients were reported from Trivandrum district, 10% patients from outside the Kerala State and remaining 62% from other districts of Kerala.

TABLE 2.

District wise distribution of new cases reported at RCC: 1997

District	No.	Percentage
Trivandrum	2466	27.5
Kollam	1819	20.3
Pathanamthitta	652	7.3
Alapuzha	503	5.6
Kottayam	249	2.8
Idukki	93	1.0
Ernakulam	627	7.0
Trichur	453	5.1
Palghat	258	2.9
Malappuram	327	3.6
Waynad	34	0.4
Calicut	243	2.7
Kannur	303	3.4
Kasargod	31	0.4
Others	905	10.0
Total	8963	100

The public relations wing of the clinical service division has been engaged in catering to the needs of the public as well as patients. The trip schedules of various vehicles are also arranged by the division.

Last year a cancer special was published from Bhasha Institute in co-ordination with this wing. Administrators, Doctors and Scientists of RCC contributed articles to this issue which cover all the areas of oncology.

Mr. Surendran Nair has written several articles in different periodicals including Janapatham and Vijnanakairali. The public relations wing has succeeded in establishing effective communication with leading daily newspapers Doordarsan Kendra, AIR, Asianet and other media. With the help of the reporters and editors of dailies and periodicals, a number of articles were published.

More than fifty press releases were issued from this wing during the year. A brochure for "Kinginicheppu" was designed and published with the financial support from State Bank Of Travancore.

This division was responsible in attending to the local hospitality and travel facilities of the distinguished visitors to the centre. More than ten conferences, workshops and seminars were coordinated by this wing in collaboration with other divisions.

Proper guidance and relevant documents were given to about 2000 patients to get financial aid from Prime Minister's Relief Fund, Chief Minister's Relief Fund and other Welfare Fund.

Training for Hospital Management Students from various institutes like SB college, Changanassery, National College of Applied Science (Franchise of IHRDE), Medical Documentation and Hospital Management, M.G. University were provided.

Mr. V. Surendran Nair has been selected as executive committee member of Public Relations Society, Trivandrum Chapter and participated in the conference organised by this chapter.

Mr. R. Raveendran Nair and Mr. Surendran Nair had delivered two lectures about RCC and its plans and programme for social workers and Rotarians in a conference organised by RCA. The school of Medical Education, M.G. University, Kottayam invited Mr. Raveendran Nair to present a paper on Consumer Protection Act and Medical Information in a seminar on Medical Information Management in changing trend 1997.

MEDICAL RECORDS SECTION

Mr. G. Rajasekharan Nair - Medical Records Officer.

During the year 1997, the new patient-registration in RCC numbered 9076 which was 6% more than that of the previous year.

Major activities

Case record assembling

Case record retrieval for out patient and in patient services

Filing

Case record preservation, physical maintenance

Coding, indexing, summary reporting, deficiency checking.

Case record distribution to the various departments viz. Tumour Registry, Imageology, Cytopathology, Nuclear Medicine and Radiation Physics, for research studies, for follow-up clinics at ECD, Ernakulam and NBRF, Karunagappally

Maintenance of IP registers, Death registers, Death certificate registers.

Death reporting to registrar of births & deaths, Corporation Thiruvananthapuram

Sending follow-up letters to loss to follow-up patients

Patient correspondence with advice from Doctor in-charge.

Arranging case record for surgical tumour board, lymphoma clinic and other clinics.

Filing of various investigation results (Haematology, Biochemistry, Urine analysis, Ultrasound Scan, Histopathology, Cytology, Aspiration report, Operation record, Teletherapy chart etc) in the concerned case records.

Arranging X-rays according to chronological order of each year and issue of these X-rays whenever requested for patient service and study purpose.

The following table shows the distribution of case records to various divisions of this centre.

	1996-1997	1997-1998
Appointment, late appointment, without appointment (out patient)	.. 89,107	87,108
Academic & research study	.. 6,901	4,859
E.C.D.C Ernakulam	.. 1,289	1,197
N.B.R.R Karunagappally	.. 557	336
Total	.. 97854	93500

The following table shows the details about incoming investigation results and X-rays filed in case records.

	1996-1997	1997-1998
Investigation results and Teletherapy chart..	10,656	5,260
X-rays	.. 1,200	1,615
Total	.. 11856	6875

Training

Provided training to 3 students of Applied Science Medical Documentation Course students, Mahatma Gandhi, University, Kottayam for a period of 3 months about medical records organisation and management.

Three students of hospital administration course from National College of Applied Sciences had completed 3 months training about medical records preservation and management at this division

Visitors

Dr. M. Gouri Dasi, Director, NIMHANS, Bangalore visited this division on 12-1997 and expressed her appreciation.

Mr. Jimmy Kattady, Faculty, BIMS, S.B. College, Changanacherry visited this division and appreciated the Medical Record performance.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF NURSING SERVICES

Sr. Vijaya

Chief Nursing Officer

Main thrust of the Nursing Division is to render quality patient care which includes physical, mental, social and spiritual aspects of the whole person. This also includes extending pain relief and palliative care to those with advanced cancer conditions.

Outpatient service

Nurses in this unit work on a straight duty pattern in the general ward as well as special Cancer clinics, Blood bank, Clinical lab, Imageology and Nuclear Medicine. Nurses have a major role to co-ordinate all the patient services by way of psychological support, proper guidance and directions towards various tests and treatment modalities, health education and by assisting doctors at the clinics.

Chemotherapy unit

The unit functions as a day care with 20 beds capacity and a number of other seating arrangements. An average 70-80 patients avail of services from this unit. The unit is totally managed by nursing staff except in cases of emergencies, when they seek the expert consultation of the Medical Officer. Nurses in this unit receive special coaching to administer cancer chemotherapeutic regimen. Normally no bystanders are allowed in this unit. Nurses are assisted by nursing assistants.

Inpatient service

a. Medical Oncology

Nurses in this unit are engaged in caring for patients with acute and chronic leukaemia, lymphomas, germ cell tumours, osteosarcoma etc. requiring aggressive chemotherapy. They often meet with challenges in taking care of patients with neutropenia and other hard realities of their life such as financial crisis, poverty, infections and impending death. Patient care is carried out by nurses and nursing assistants as bystanders are only allowed during visiting hours.

b. Radio Iodine Unit

The unit has a bed capacity for 7 patients to be admitted. Carcinoma thyroid patients are isolated in this special unit with the intake of radio-iodine. The nurses are on call to the unit through an intercom line system and take necessary precautions against radiation hazards.

c. Surgical Oncology

This unit comprises of operation theatre and surgical wards. In addition to the major and minor surgical emergency cases, diagnostic investigations are also carried out. The unit has been fully occupied with a variety of major cases-anterior posterior resection, maxillectomy, thyroidectomy, oesophageo-gastrectomy, AK/BK amputation and so on. Patient care is exclusively by the nursing staff since bystanders are not allowed.

d. General Ward

The unit has a capacity of 73 beds. Patients are looked after by nurses and nursing assistants who are placed in an adequate ratio for effective patient care. Regular unit meetings and educational sessions are well arranged in the wards to update the clinical skills of the nursing staff. Majority of the patients getting admitted in this unit belong to poor category and are in advanced stage of the disease requiring close attention by the staff.

e. Payward Block

The unit consists of patients with all kinds of cancers like paediatric, surgical, medical and palliative cases. Though bystanders are allowed to be with the patient, nurses make an earnest effort to render comprehensive nursing care to each patient.

f. Brachytherapy

The unit has a bed capacity for 10 patients for interstitial implantation, mould treatment, intracavitary application such as selectron, intraluminal radiotherapy and radium implantation. All staff in this unit get special coaching on radiation hazards and patient care.

g. Paediatric Oncology

Children with leukaemia, lymphoma, neuroblastoma, Wilm's tumour and CNS tumour are cared in the unit. A play room with all necessary play items and furniture are available for the children. Mothers are permitted to stay with their children in the unit. Volunteers spend considerable time occupying the children diversional activities.

h. Palliative care

Palliative care is extended through pain clinic and IP services. One nurse assists the doctor in the pain clinic daily, by way of listening to patient complaints, making pain assessment, dispensing medicine,

counselling and attending to their physical and mental needs. There is a group of nurses who have been oriented to palliative care for taking care in the IP wards and rendering palliative care to advanced cancer cases. Their activities include visiting their patients daily, carrying out special nursing care including selected complementary therapies, teaching home care aspects of cancer care to the patient and close relatives.

Staff Development Programme

Regular inservice education programme is conducted in all nursing units by way of arranging classes by doctors or other experts, case presentations, case studies etc. There is also regular monthly meetings of the nursing staff for academic discussions and for rectifying other patient care issues.

Nursing standards are set and a few units are getting ready to be audited. In all the IP wards, problem oriented nursing care records are maintained.

Observation visits and orientation programmes

Services of this division is open to graduate and post graduate students from state as well as national level through special classes and orientation to patient care units. A total of 275 nursing students have been benefitted from such orientation programmes during the year.

Nursing assistants training programme

The first batch of nursing assistants trainees have finished their apprenticeship and are posted in RCC on contract duty. Second year trainees are on their one year apprenticeship.

Volunteers training programme

Volunteer programme has entered its second year successfully. The group holds 75 society women having different other occupations. With a week's training programme, on Home Care, many of them are equipped for better domiciliary cancer care and in the hospital they are engaged in the paediatric and chemotherapy units.

Bystanders programme

The cancer carer's programme which was initiated during the previous year is taking a good shape in teaching the basic nursing procedures to those patients with advanced cancer and their immediate carers. Nurses in all units take keen interest in this programme.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF PHARMACEUTICAL SERVICES

Dr. Gangadevi T. - Addl. Professor (I/C)
Sri. Sivasankara Pillai K. - Pharmacist cum Store Keeper

The division renders services to supply quality medicines/ equipments, chemicals/ reagents and other disposable items which are required for in patients, out patients, diagnostic departments, research division and palliative care units. Drugs and chemicals are dispensed on weekly requirements. Medicines and other items are being issued through computerised system by which the daily stock position is ascertained and stocks replenished.

The central store of the division has 34 anti-cancer drugs, all first and second line of antibiotics, analgesic, anti-pyretic, anti-histaminic, diuretics, laxative drugs and costly disposables like removable suction, catheters fluids and pain clinic drugs like morphine sulphate tabs and liquid morphine. The Central Store is responsible for:

- Receipt of all drugs, disposable items, glassware, equipments, X-ray films/ Chemicals, Laboratory Chemicals and Reagents, Cleaning materials, Clothing materials for patients/ staff, from different suppliers as per the purchase order from purchase section.
- Receipt/issue of local purchase items to meet the emergent requirements in wards/departments.
- Stock entry as per invoice is made into the computer stock from time to time.
- Issue of anti-cancer drugs, anti-biotics, fluids and other disposable to pharmacy for patients care service.
- Issue of all drugs (except anti-cancer drugs), other disposables and cleaning materials are issued for all wards/departments through their weekly indents after the perusal of Medical Superintendent.
- All types of issue will be entered into the computer stock.
- Proper maintenance of stock and accounts.
- Conducting of stock verification on a monthly basis.
- Preparation of all indents in time.
- Purchase of all drugs and other requirements are mainly through open tender system. The requirements will be calculated on the basis of

average monthly consumption recorded during the last one year. Purchase is made as and when required to meet the exigencies of the equipment for a particular period/ case as per sanction accorded by the superintendent. A considerable number of patients are getting free drugs.

Detailed reports for the period under review are as follows:-

Total patients reported / treated was	- 5870
No. of patients benefitted with free drugs	- 1566
Total patients benefitted with CCL	- 145
Total patients benefitted with ESI	- 155

DIVISION OF PAIN AND PALLIATIVE CARE

Dr. Vasudevan Mappat

-Anaesthesiologist

The division is rendering services in the management of pain and palliative care. Patient attendance in the pain clinic is increasing every year. During the year under reporting 1703 new cases and 5751 old cases were seen at the pain clinic.

		Current year	Previous year
WHO	Step I	52	65
	Step II	402	528
	Step III	7000	964

The pain clinics at Kollam, ECDC, Katoor and ECDC Palakkad are catering to the needs of patients in the respective areas.

This division works as a team with the active participation of members of other divisions and the college of pharmaceutical sciences.

DIVISION OF BLOOD BANK

Dr. Jayalekshmi P	- Blood Bank Officer
Dr. Kusumam K	- Medical Officer
Mr. Meera Sahib P	- Senior Scientific Assistant
Mrs. Ganga Devi C	- Senior Technician

During the reporting year there was an increase in the number of donors, component preparation such as packed red cells, platelet plasma, as compared to the previous years.

A blood grouping camp was conducted at Bethany Hospital, Nalanchira on February, 1998 where 55 persons were grouped. In another camp conducted at College of Engineering, Trivandrum, on March, 1998 where 148 persons were grouped.

Blood Bank Statistics (01/04/97 to 31/03/98)

Blood grouping	- 16,200
Cross matching	- 5926
Blood donors	- 5413
Hbs Ag done	- 5413
Hbs Ag +ve (donors)	- 66
HIV done (donors)	- 5413
HIV +ve (donors)	- 3
HCV done (donors)	- 2000
HCV +ve (donors)	- 5
VDRL (donors)	- 5413
VDRL +ve (donors)	- 4
HIV done (Patients)	- 2228
HIV +ve (Patients)	- 2

Components Prepared

Whole blood	- 855
Packed Red Cells (PRC)	- 4553
Platelet Rich Plasma (PRP)	- 2489
Fresh Frozen Plasma (FFP)	- 297
Single Donor Plasma (SDP)	- 392

DIVISION OF CYTOPATHOLOGY

Dr. N. Sreedevi Amma	- Deputy Director & Professor
Dr. B. Chandralekha	- Professor
Dr. Elizabeth K. Abraham	- Addl. Professor
Dr. Jayasree K	- Asst. Professor
Dr. Rekha A. Nair	- Asst. Professor
Dr. Anitha Mathews	- Lecturer
Dr. Raveendran Pillai K	- Cytotechnologist
Sri K. Sujathan	- Cytotechnologist
Dr. Laxmi Narayanan	- Senior Scientific Officer

Diagnostic Services

Gynaec Cytology

Cervical smears were examined from 1924 cases, of which 1120 were from various projects which included a comparative study of pap smear, cervicospopy, colposcopy and biopsy, and the remaining 804 were from hospital cases. High grade intraepithelial lesions were reported from 26 cases (10 from hospital cases and 16 from project cases).

Non-Gynaec and Aspiraton Cytology

From a total of 7314 FNAs, 1577 malignancies were diagnosed. The major sites were Thyroid (2616) Lymph nodes (1572) and Breast (1199) (Fig. 2). Some of the rare and interesting lesions diagnosed by cytology are oligoastrocytoma, infiltrating zygomatoc region, mediastinal thymoma, hydatid cyst lung, granular cell myoblastoma tongue, anaplastic large cell lymphoma confirmed by immunocytochemistry, giant cell tumour of tendon sheath, AML- M₅ infiltrating lymph node, renal cell carcinoma with sternal metastasis.

Fluid Cytology

A total of 1099 samples of aspirated fluids from body cavities and natural secretions were examined. Maximum number of samples were CSF (524) from acute leukaemia cases after induction and on follow-up.

Bone marrow aspirates and imprint smears

Bone marrow aspirates and imprints were studied from 1888 cases, of which 514 were newly diagnosed malignant cases. Acute leukaemias were the predominant lesion diagnosed (321 cases). On subclassification it was observed that Acute lymphoblastic leukaemias were higher (175

cases - 34%) than acute myeloid leukaemia (146 cases - 28%). 146 cases diagnosed included 6 cases of myelodysplastic syndromes (MDS) and one case each of plasma cell leukaemia and adult T cell lymphocytic leukaemia (ATLL) (Fig. 3).

Sputum Cytology

Sputum samples were examined from 798 cases, by collecting samples from each case and making 2-3 smears from each sample. A total of 49 malignancies were reported. The predominant malignancies were squamous and adenocarcinoma (20 cases each). Seventeen cases of buccal smears were examined for Barr body, which was positive in 10 cases.

Histopathology

Histopathological examinations were done in 5178 cases, of which 3267 cases were surgical specimens from the centre and 1911 were review slides of patients referred from other hospitals. Frozen section facilities were provided to 19 cases. A total of 3065 malignancies were reported. The predominant sites of malignancy were oral cavity, breast, cervix, lymph node, and GIT (Fig. 1).

Some of the rare and interesting lesions were carcinosarcoma of the lung, mucinous cystadenoma of bronchial gland, adenoma malignum (minimum deviation adenocarcinoma) of cervix, multinodular cystic renal cell carcinoma, adult Wilms tumour, adenocarcinoma in Barrett's oesophagus, malignant carcinoid of small intestine with lymph node metastasis, diffuse sclerosing variant of papillary carcinoma thyroid and squamous cell carcinoma in psoriasis.

Teaching and Training

The staff of this division have participated in the daily morning clinical monthly special clinics and other academic activities. Some of the staff were invited to conduct CME/workshops/seminars/panel discussions at different centres in India. The centre has been honoured by the International Academy of cytology by inviting Dr. Sreedevi Amma, Head of the department, as a contributor from India to three task force discussion workshops held in an International Expert's conference in Hawaii, USA on Diagnostic cytology towards the 21st century.

The division carries out full time cytotechnicians and cytologists training courses of 6 months and 1 year duration respectively as per set syllabus and curriculum. The division is accredited by Indian Academy of Cytologists (I.A.C) for diagnostic and examination purposes.

We are also involved in the teaching and training programme of medical and paramedical students of Medical College, Trivandrum and paramedical students of Mahatma Gandhi University, Kottayam. Short term training is also imparted to Pathology post graduates of Dental College, Trivandrum and Medical College, Calicut. Short term training to update the knowledge was imparted to two candidates from Tata Memorial Centre Rural cancer project, Barsi during January and February 1998.

Research projects

Evaluation of unaided visual inspection, cervicospscopy and pap smear in screening for cervical cancer

(Funded by: IARC)

Co-investigator Dr. N. Sreedevi Amma

Trivandrum Oral Cancer Screening Project (TOCS)

(Funded by: IARC)

Co-investigators Dr. N. Sreedevi Amma

Dr. Elizabeth K. Abraham

Biological prognostic markers in oral squamous cell carcinoma

(Funded by: ICMR)

Co-investigator Dr. Elizabeth K. Abraham

Genomic instability in breast cancer

(Funded by: Dept. of Science, Technology & Environment, Govt. of Kerala.)

Co-investigator Dr. Elizabeth K. Abraham

Molecular epidemiology of cancer of the oral cavity and oropharynx

(Funded by: IARC)

Co-investigator Dr. Elizabeth K. Abraham

Evaluation of AgNoR, Transferrin Receptors and Radiation Induced micromultinucleation as indices of proliferation and radiosensitivity in oral cancer

(Funded by: Dept. of Science, Technology and Environment, Govt. of Kerala)

Co-investigators Dr. Chandralekha B.

Dr. Jayasree K.

7. **Etiopathological studies in Hodgkin's disease with emphasis to the role of Epstein Barr Virus**
(Funded by Dept. of Science, Technology and Environment Govt. of Kerala)

Co-investigator Dr. Elizabeth K. Abraham

Awards

Sri. Sujathan K., Cytotechnologist was awarded the "Sathyamanga National Award 1997" by Indian Academy of Cytology for the best paper in immunocytochemistry published during the last year.

Training

Dr. Rekha A. Nair attended a training course on DNA technology at centre for DNA finger printing and diagnostics - CCMB, Hyderabad in March, 1998.

Association with professional bodies

Dr. N. Sreedevi Amma: Member of IAC (Indian Academy of Cytology) and A&E committee of IAC, Editorial board of Journal of Cytology, IAC Kerala chapter, Governing body of Amala Cancer Hospital Trichur, Governing body of RCA.

Dr. B. Chandralekha: Member of IAC, Treasurer IAC, Editorial Board of Journal of Cytology, IAPM Kerala Chapter and Executive member of RCI.

Dr. Elizabeth K. Abraham: Member of IAPM, IAC, Review committee of IJMR, Research committee of RCC and governing body of RCA.

Dr. Jayasree .K: Life member of IAC, Member of International Academy of pathology (Indian division), IAPM Kerala Chapter, Indian Society of Blood Transfusion and Immunohaematology.

Dr. Rekha A. Nair: Life member of IAC, member of IAPM.

Dr. Anitha Mathews: Member of IAC and IAPM, Kerala Chapter.

Dr. Raveendran Pillai K. :Member of IABMS (Indian Association of Biomedical Scientists).

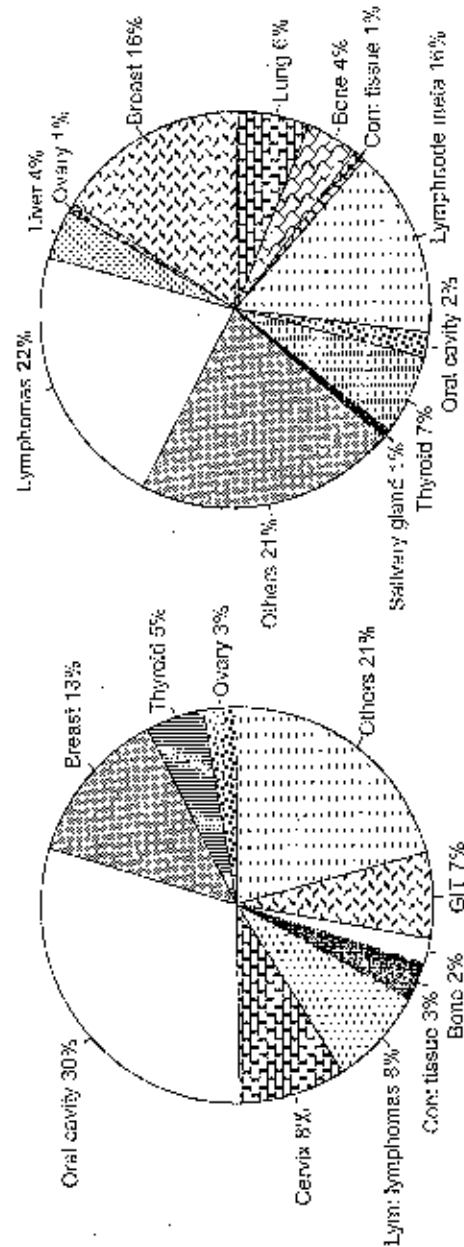
Sri. Sujathan K.: Member of IABMS & ISCB (Indian Society of cell biologists).

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

MALIGNANT LESIONS IN MAJOR SITES



(a) Histopathology (n=3065)

(b) Aspiration cytology (n=1577)

Fig. 1

Fig. 2

HEMATOLOGICAL MALIGNANCIES (n = 514)

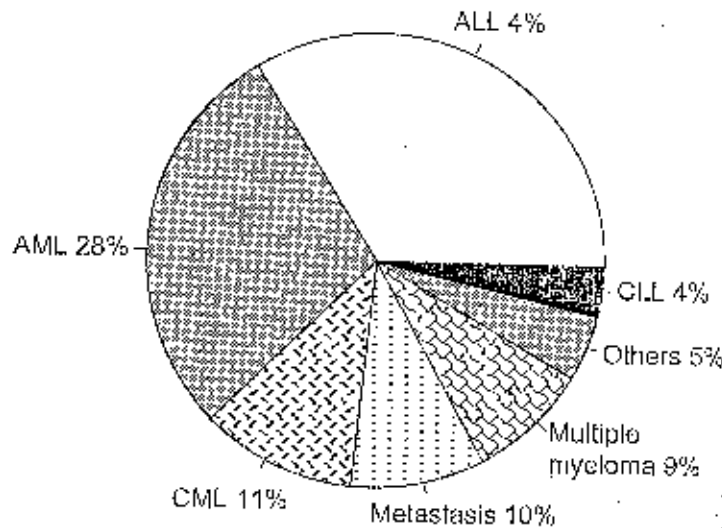


Fig. 3

DIVISION OF IMAGEOLOGY

Dr. K. Sasidharan	- Professor
Dr. Alex K. Ittyvirah	- Assoc. Professor
Dr. K. Ramachandran	- Assoc. Professor
Dr. A.S. Krishnakumar	- Asst. Professor

Diagnostic and interventional studies done during the period under reporting are as follows:-

Plain X-ray	- 14,509
X-ray tomography	- 31
Barium study	- 223
IV contrast study (IVP & Venogram)	- 17
I/Thecal contrast study (Myelogram)	- 17
Mammogram	- 873
Ductogram	- 7CT
Scan	- 5717
C.T. & guided procedures	- 226
Ultrasound	- 7020
Doppler studies	- 354
Ultrasound Guided FNAC	- 60

Academic Activities

Six weeks training on ultrasonography for post graduate degree/diploma holders continued this year and 18 candidates completed the training. Teaching of undergraduates and post graduates on basic principles of modern imaging techniques was continued. The film reading sessions every day morning and the monthly meeting of Trivandrum Radiology Club provided opportunities for discussion of interesting and problematic cases for diagnosis.

Ongoing Projects

1. Comparison of carotid artery stenosis and ankle - brachial systolic index in patients with Ischaemic stroke. MD Thesis Dr.Sajeev Kumar.KS, PG, MD General Medicine, Medical College, Trivandrum.
2. Comparison of Doppler study and HCG values in Vesicular Mole Dr.Bindu, MNAMS student in Obstetrics & Gynaecology, SATH, Trivandrum.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF NUCLEAR MEDICINE

Dr. V.M. Pradeep - Assoc. Professor

Dr. A Sreekumar - Lecturer

The division continued to provide diagnostic, therapeutic research activities involving the use of open radioactive sources. Major part of the activities was devoted to thyroid studies. These include thyroid scans and uptake, radioimmunoassays and treatment for thyroid cancers and thyrotoxicosis. Research projects were initiated in clinical and biological studies of the thyroid. The details of the work in the clinic are outlined in Table 1.

TABLE 1

Category	Cases
New cases registered	10,742
Thyroid scans	2,819
Thyroid uptake	1,623
Thyroid ultrasound	2,955
Thyrotoxicosis	191
Ca. Thyroid	363

Immunoassay section showed further increase in workload. Detailed breakup is shown in Table 2.

TABLE 2

Sl. No.	Assay	No.
1.	T3	10,437
2.	T4	10,437
3.	FT3	322
4.	FT4	322
5.	TSH	10,437
6.	TG	1,157
7.	PTH	150
8.	ATG	461
9.	AMC	461
10.	FSH	568
11.	LH	486

12.	PROLACTIN	795
13.	TESTOSTERONE	252
14.	PROGESTERONE	62
15.	17-OH-PROGESTERONE	19
16.	CORTISOL	236
17.	ACTH	88
18.	GH	139
19.	BETA-HCG	6,851
20.	AFF	984
21.	CEA	1,134
22.	CA125	714
23.	PSA	366
24.	INSULIN	125
TOTAL		47,003

1178 cases were studied in the gamma camera. Work in the gamma camera was primarily bone scanning for cancer patients. Apart from this, renal function studies and studies like GI bleed and MUGA studies were also carried out.

Bone scan - 946

Renal studies - 198

Others - 80

Treatment of 220 cases of cancer thyroid and 150 cases of thyrotoxicosis were carried out.

Academic Activities

1. Training to CRA, MBBS, MD and MS students.
2. Dr. V. M. Pradeep, Co-guide to MD thesis

Ongoing project

Programmed Tumour Cell Death and proliferative fraction in the staging of thyroid cancer

(Funding agency: ICMR)

Co-Investigator Dr. V. M. Pradeep

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF RADIATION PHYSICS

Dr. V. Padmanabhan	- Professor
Sri. C.A. Davis	- Assoc. Professor
Sri. Thayal Singh Elias	- Asst. Professor
Sri. L.S. Arunkumar	- Asst. Professor
Dr. Raghu Ram. K. Nair	- Asst. Professor
Smt. P. Vasugi	- Lecturer

Highlights of activities

Clinical Physics

Calibration of Radiotherapy equipments
 Quality assurance
 Treatment Planning
 Dose Computation
 Radiation Safety
 Inter comparison studies using TLD (WHO/BARC)
 Daily maintenance, checking and repair of all teletherapy brachytherapy equipments.

Patient Services

Treatment planning and related dose computation were carried routinely for patients undergoing external beam therapy and brachytherapy. The number of patients treated during the reporting year follows:

External Beam Radiotherapy	- 6072 patients
Brachytherapy	- 514 patients
Intracavitary Ca. CX, Selectron	- 303
Intracavitary Ca. CX, Manual	- 80
Intracavitary Oesophagus	- 33
Interstitial implants	- 88
Mould (Palate, Penis etc)	- 10
Total	- 514
Mouldroom	
POP Shell	- 41
Orfit / Aquaplast	- 378
Bite block	- 298
Wax bolus	- 67
Moulds	- 10
	<u>787</u>

Academic Programme

Teaching and training on Medical Physics were imparted to the following categories of students.

1. Diploma in Radiological Technology (DRT)
2. B.Sc. (MLT), DMLT
3. B.Sc. Nursing
4. M.Sc. Nursing
5. MBBS
6. DMRT
7. DMRD
8. MDS (Oral Radiology)
9. MD (Radiotherapy)
10. MD (Radiodiagnosis)

Training Programme

1. Practical field training for two months was given to two students of the Diploma in Radiological Physics (Dip RP) course of BARC, Mumbai.

2. CRA / DRT Refresher Programme

Up to March '98, a total of 48 students have been trained in Imageology / Nuclear Medicine and 19 students in Radiation Physics / Radiotherapy. Dr. Raghu Ram. K. Nair, Dr. Alex Ittiyavirah and Mr. L.S. Arun Kumar co-ordinated the programme.

Research Projects

1. Radiation Beam analysis, leakage measurements and radiation survey of TeleCobalt machine

Ms. Mini. M. Nair

M.Sc Applied Physics Students,

Ms. Archana. P.

Department of Physics,
 University of Kerala,
 Kariavattom.

Guides

Mr. C.A. Davis, Dr. V. Padmanabhan, Dr. S. Devanarayanan (Dept. of Physics, University of Kerala, Kariavattom.)

The quality assurance tests of radiation beam, measurement of leakage radiation through source housing and radiation survey of Theratron 780-C were carried out. The parameters-radiation output, percentage depth dose beam profiles were studied. The measured values were in agreement with the values already available. The leakage measurements and radiation survey results were found to be well within the prescribed values by ICRP. The Theratron 780-C satisfied fully the safety requirements stipulated by the AERB, Mumbai.

- 2. Quality control and physical parameters in diagnostic unit**
Doctoral programme of Mr. G. Ramakrishnan, Dept. of Radiology, Medical College, Trivandrum (submitted)

Guide: Dr. V. Padmanabhan

- 3. Patient and organ dose measurements in CT Scanners – A study**

(Funded by: Dept. of Science, Technology and Environment, Kerala)
Principal Investigator Dr. V. Padmanabhan
Co Investigator Mr. G. Ramakrishnan
(Medical College, Trivandrum)

The project has been completed with the following findings :-

The study of dose measurements for different CT examinations revealed the following mean doses.

Investigation	Patient mean dose mSV	Organ dose (mSV)			
		Ovary	Testis	Thyroid	Eye
Head (plain)	15.61	NA	NA	1.55	16.71
Head (plain & contrast)	22.56	NA	NA	1.78	21.78
Abdomen	19.25	6.90	1.66	NA	NA
Chest (plain)	16.87	0.794	0.11	24.52	24.42
LS Spine (plain & contrast)	17.86	6.80	1.34	NA	NA
Spine	17.25	NA	NA	2.62	NA
PNS	11.36	NA	NA	1.18	10.18

All the dose levels are below the IAEA quoted values

- 3. Development of indigenous wedge filters for megavoltage x-rays and cobalt-60 gamma radiations used in radiotherapy. This is a year study and is in progress.**

(Funded by: Dept. of Science, Technology & Environment, Kerala)



Sri. Vijaya Chandran I A S Health Secretary releasing the book "Some selected topics in Radiological Physics." Also seen are Dr. M. Krishnan Nair and Dr. V. Padmanabhan

Principal Investigator Mr. Arun Kumar.L.S.
Co-Investigators Dr.V. Padmanabhan, Dr. M. Krishnan Nair

Wedge filters are currently not manufactured in India. These wedges need to be imported at exorbitant price. That too is available in discrete values of wedge angles and wedges with intermediary angles are not available. But wedges with intermediary values are often needed in some clinical situations where only with these wedges satisfactory dose distribution can be achieved. Presently in such situations wedges with available angles are used or a combination of wedges are tried.

The proposed work is aimed at the design and fabrication of wedge filters for various angles, both conventional and non-conventional values. The design of the wedges are complete for lead and lipowitz for conventional and non-conventional values of angles. The fabrication of the same for lead and lipowitz for Co-60 gamma radiations and 4 MV X-rays is completed. Dosimetry of each wedge filter was worked out using small volume ion-chamber and water phantom system for both cobalt-60 gamma radiations and for mega voltage x-rays. The design and fabrication of the same for other materials shall be attempted.

Natural background radiation registry (Physics studies ongoing)

(Funded by: The Dept. of Atomic Energy, Govt. of India)

Dr. Raghu Ram K. Nair supervises the physics study of this project.

External gamma measurements with R scintillometer in all panchayats of Karunagappally Taluk were completed. Thoron in breath measurement have been taken. TLD, soil analysis & SSNTD studies are in progress.

5. Dosimetry of early head & neck cancers, mande field treatments and cervical cancer using indigenous remote after loader applicators with special reference to radiation protection.

(Funded by : Atomic Energy Regulatory Board, Mumbai)

Principal Investigator Mr. T.S.Ellas
Co-Investigators Dr.V.Padmanabhan, Mr.C.A.Davis
Mr.L.S.Arun Kumar

Dosimetry has been completed in 75 patients.

It is predicted that IFD measurements are within a variation of 3 to 5 mm. The reproducibility of contours using contour plotter is 0 to 2 mm. Dose measurement for 25 patients with irregular field treatment has been done

using TLD and Nucleonix TLD reader. The irregular field blocks are for each patient.

6. Development of Indigenous after-loader system in the treatment of Carcinoma of Cervix Uteri

(Funded by: Dept. of Science & Technology, New Delhi & RCC)

Principal Investigator Mr. T.S. Ellas

Co-Investigators Dr. V. Padmanabhan, Mr. C.A. De

Dr. M. Krishnan Nair,

M/S. Small Systems, Bangalore

In this project the technology has been demonstrated by a prototype fabricated in RCC. The third and final developmental model is getting ready.

7. Dose measurements in patients undergoing diagnostic X-ray examinations including special investigations

(Funding Agency: Atomic Energy Regulatory Board, Mumbai)

Principal Investigator Mr. L.S. Arunkumar

Co-Investigator Dr. V. Padmanabhan,

Dr. M. Krishnan Nair

The project was sanctioned in December, 1997.

X-rays are used as one of the beneficial tools in medicine for diagnostic purposes. However this application leads medical X-ray to be the largest man made contributor to the radiation dose received by the population. India is no exception to this where an estimated number of about 60 thousand units were installed and about 1500 units added every year. The use of radiation in medicine is increasing day by day. The emphasis of radiation protection is to ensure that the doses are not only low enough to justify a particular diagnostic examination, but also to keep lower doses reasonably achievable. Consequently, authorities responsible for radiation protection have become increasingly involved in measuring and evaluating the dose received by patients during X-ray examinations.

The risk from radiation exposure has been evaluated by scientific agencies such as UNSCEAR, BEIR, NRPB, and NCRP. There is a need to continue analyzing trends and doses because such information permits comparisons and is an essential input material for bodies involved in optimizing procedures and radiation protection. As pointed out in ICRP

"Because most procedures causing medical procedures are clearly justified and because the procedures are usually for the direct benefit of the exposed individual, less attention has been given to the optimisation of protection in medical exposure than in most other applications of radiation sources". As a result there is considerable scope for dose reduction in diagnostic radiology. The proposed work aims at the evaluation of skin entrance exposure (SEE) during diagnostic X-ray investigations including special investigations using thermoluminescence dosimeters.

Fellowships/Awards etc.

Dr. S. Arunkumar has awarded UICC, ICRET fellowship to do a project titled "Dosimetric and practical aspects of MLC conformal therapy" at the Royal Marsden Hospital, London, UK during November - December, 1997.

Nominations

Dr. V. Padmanabhan

1. Currently holding the position of President of KAMP

2. MD/DMRD (Radiodiagnosis) Examiner Medical College, Tvrm
10.5.97

3. DMRT/MD (Radiotherapy) examiner Dr. MGR Medical University
Chennai 6-4-98

4. Member, Board of Trustees, AMPI

5. Member, Board of Trustees, IARP

6. Chairman, Organising committee, workshop on quality assurance in RT & Diagnostic radiology for Radiographers, 7-8 November 97

Dr. Arun Kumar

1. Convenor, Scientific program for workshop on Quality Assurance in Radiotherapy & Radiodiagnosis conducted at Regional Cancer Centre, Trivandrum during 7-8, November 1997.

2. Currently holding the position of Secretary and Treasurer KAMP.

3. Actively involved with the newly started Orientation Programme for Radiographers in Radiotherapy and acting as the Co-ordinator of the programme and four batches of trainees have successfully completed the programme during the current year.

4. Appointed as Skilled Assisatnt for DMRT & MD (Radiotherapy) examination at Regional Cancer Centre, Trivandrum .
5. Examiner – BSc, MLT – Unlverslty of Kerala

T.S.Ellas

1. Visited M/S. Small Systems, Bangalore, six times during the year to involve in the development of Remote Afterloader project.
2. Radiation dosimetry of Radiotherapy equipments was carried out at Neyyoor hospital.
3. Dental X-ray survey at General Hospital, Neyyatinkara

Invited Talks

Dr. V.Padmanabhan

1. Facts & figures about radiation. Symposium on medical physics and radiation protection, Mysore 27-7-97
2. Radiation epidemiology – panel discussion Mphil course in epidemiology, Medical College Trivandrum 15-7-97
3. Presidential address 8th annual KAMP meeting RCC-Trivandrum 9-11-97

Dr.Raghu Ram K. Nair

Science programme in AIR

- May, 97 - How pain killers and tranquillisers work
- July, 97 - Hormones that regulate our metabolism
- January, 98 - Cancer can be controlled

L.S.Arunkumar

Delivered two guest lectures on "Molecular effects of Ionizing Radiations" for the postgraduate students during January, 1998 at Women's College, Trivandrum.

Meetings organised

1. Third Dr.T.P.Ramachandran memorial oration

Dr.Krishnan Nair, Director of the centre, delivered the Dr.T.P.Ramachandran memorial oration on 9.11.97 in the conference of the centre. The topic "FRCR and after".

2. Workshop on quality assurance in RT & RD

The above workshop was organised by KAMP in RCC Trivandrum for radiographers. There were included lectures by eminent radiologists

and physicists working in the state of Kerala, both in government and private sector. The participation was limited to 50 radiographers working in the state.

8th annual conference of KAMP Nov., 1997.

During the 8th annual meeting of KAMP, Sri.B.Vijayachandran, Minister for Health & family welfare released the book "Some selected papers in Radiological Physics". Earlier the President of KAMP, Dr.V.Padmanabhan gave presidential address – "Medical Physics – A challenge for the future".

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF CANCER EPIDEMIOLOGY AND CLINICAL RESEARCH

Mr. P Gangadharan	- Emeritus Medical Scientist (ICMR)
Dr. Cherian Varghese	- Assoc. Professor of Cancer Epidemiology & Clinical Research
Dr. Aleyamma Mathew	- Asst. Professor of Computational Statistics & Epidemiology
Ms. Padmakumary Amma	- Medical Statistician

The Division of Cancer Epidemiology (HCR) and Clinical Research runs the Hospital Cancer Registry, Population based cancer registry in Trivandrum and Karunagapally and conducts Epidemiological and Clinical cancer Research. The staff of this Division contribute to the clinical teaching programs of the center. Assistance in the design, execution and statistical analytical support is provided for post graduate and doctoral dissertation and research programmes.

HOSPITAL CANCER REGISTRY

The Hospital Cancer Registry covering the Regional Cancer Centre and Medical College Hospitals in Trivandrum has abstracted, analyzed and presented the report for the year 1995. The database of HCR is the source for various research programs.

Cancer pattern in RCC, Trivandrum, in 1995

Six thousand three hundred and fifty seven (6357) cases were reported during the year 1995. The distribution of cancer cases with respect to site, age and sex are given in Tables 1 & 2. The male : female ratio was 1.1:1. The peak age frequency in males was observed in the 7th decade and in females in the 6th decade. The age distribution of males and females are shown in Fig. 1. Ninety percentage of cases were microscope verification of diagnosis. Among the 4966 previously untreated cases, 6.5% were in the early stages. Among those reported for treatment, 19.7% were palliatively treated and 64.9% were treated with a curative intent. Analysis by type of treatment showed 39.1% received radiation as the only form of treatment and 57.8% combination with other forms of therapy.

Leading Cancers

Lung was the commonest site of cancer among males and among females it was breast cancer. The ten leading sites of cancer are shown in Table 1. The system wise distribution of cancers are shown in Fig.

Childhood Cancers

Childhood cancers formed 294(4.6%) of the total cancer cases. The leading sites were leukaemia 131(44.5%), central nervous system 31(10.5%) and lymphoma 36(12.2%).

Other Ongoing projects

Molecular Epidemiology of Paediatric Leukaemia and Lymphoma in Kerala, India

(Funding agency: Kay Kendall Leukaemia Fund, UK)

Investigators Dr. Cherian Varghese, Dr. Kusumakumary, Dr. Thomas Abraham, Dr. Rekha, Dr. M.Krishnan Nair.

Collaborators Dr. Gareth Morgan, Prof. R. Cartwright, University of Leeds

Duration 1997-1999

This molecular epidemiology study has collected 26 cases and 44 controls in the reporting year.

Pesticide exposure and breast cancer.

(Funding agency: National Cancer Institute, USA)

Investigators Dr. Cherian Varghese, Dr. Aleyamma Mathew, Dr. Iqbal, Dr. M.Krishnan Nair.

Collaborators Dr. Susan Sturgeon, Dr. Reshmi Sinha, (National Cancer Institute, USA).

The work has been stabilized and the main study is ongoing. Fifty six patients have been recruited in the reporting year and detailed dietary data and other information have been collected in addition to biological samples.

Human Papillomavirus and cervical neoplasia.

(Funding agency: Institute of Cancer Research, Cancer Research Campaign, UK)

Investigators Dr. Cherian Varghese, Dr. Prabha Balaram, Dr. M.Krishnan Nair.

Collaborators Prof. J. Peto, Dr. J. Deacon, (Institute of cancer research, Cancer Research Campaign, UK).

This cohort study has completed the third round of screening and collection of biological samples. The analysis for HPV and data management are in progress.

4. **Surveillance programme for monitoring cancer incidence and mortality in Trivandrum.**

(Funding agency: International Agency for Research on Cancer, Lyon, France).

Investigators Dr. Cherian Varghese, Dr. Aleyamma Mathew, Smt. Padmakumary, Dr. M. Krishnan Nair

Collaborators Dr. R Sankaranarayanan, (Unit of Descriptive Epidemiology, International Agency for Research on Cancer, Lyon).

This programme has established as a reliable population based cancer registry and cancer incidence rates for the region are now available. The registry also offer the potential for undertaking epidemiological studies in the population covered.

5. **Occupation and cancer.**

(Funding agency: International Agency for Research on Cancer, Lyon, France).

Investigators Dr. Cherian Varghese, Dr. Aleyamma Mathew
Collaborators Dr. P. Boffetta.

(Unit of Environmental Epidemiology, International Agency for research on Cancer, Lyon).

This case-control study to address the occupational risk factors for cancers of the lung and leukaemias has completed data collection in December 1997. The data management and analysis are in progress.

6. **Randomised clinical trial: Droloxifene for metastatic breast cancer**

(Funding agency: M/S Pfizer Ltd., Mumbai)

Co-Investigator Dr. Cherian Varghese

7. **Familial cancer registry (1995-2000), Trivandrum**

Co-Investigator Dr. Aleyamma Mathew

8. **Trivandrum quality of life study (Pilot project completed)**

Co-investigators Dr. Aleyamma Mathew
Ms. Latha PT

Meetings organised

The RCC seminars in oncology

The division is organising the programme 'The RCC Seminars in Oncology' which started in 1997. The second, third and fourth seminars were held in the period under reporting. Dr Purvish Parikh from Memorial Hospital, Bombay, gave a lecture on 'Biological Response Modifiers' in August 1997.

Surveillance programme on breast neoplasms

A CME programme on breast neoplasms held on 20th July, 1997 was organised in RCC by the division. Sixteen staff members from the divisions of RCC presented topics on Breast Neoplasms, its epidemiology, pathology, genetics, clinical features, treatment and psychosocial support. The CME was well attended by doctors and postgraduate students from all parts of the State of Kerala.

Teaching

Dr. Aleyamma Mathew delivered a series of lectures on biostatistics and epidemiologic methods to medical students and professionals at Regional Cancer Centre, Trivandrum, Feb-March, 1998. Another series of lectures on biostatistics with computer applications for M.Phil students of Clinical epidemiology organised by International Clinical Epidemiology Unit, Medical college, Trivandrum, Feb-April, 1997.

Visit by foreigners

Prof. James R. Hebert, Professor of Medicine and Epidemiology at the University of Massachusetts, USA, has visited us as part of his Fulbright scholarship in January 1998.

Dr. Salehuddin Abu Bakar from the Government of Malaysia did his WHO fellowship on Cancer Control in July 1997. We were able to generate a proposal for setting up a comprehensive cancer control programme in Malaysia during this fellowship. Projects were also prepared for cancer control programs in different Districts of Kerala State.

Association with professional bodies

Dr. Aleyamma Mathew

Member of Indian Society for Medical Statistics
Member of Indian Association for Cancer Research
Advisory board member of the Journal of the Academy of Clinical Microbiologists.

TABLE 1
Regional Cancer Centre - Trivandrum: Cancer Cases of 1995 Age by Site - Males

ICD	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+	Total	%
140	Lip	-	-	-	1	-	-	-	1	-	-	2	6	5	2	2	4	23	0.68
141	Tongue	-	-	-	-	-	1	4	7	15	24	30	47	31	34	20	17	230	6.84
142	Salivary, GI	-	-	-	-	1	-	4	2	1	2	21	1	1	1	4	1	20	0.59
143	Gum	-	-	-	-	-	-	-	-	2	10	3	6	11	13	10	12	67	1.99
144	Floor of mouth	-	-	-	-	-	-	-	1	1	6	1	5	6	4	1	-	25	0.74
145	Other mouth	-	-	-	-	-	1	2	6	14	30	27	36	36	45	28	35	260	7.73
146	Oropharynx	-	-	-	-	-	-	-	1	5	11	15	18	20	20	10	11	111	3.30
147	Nasopharynx	-	-	-	2	4	-	1	3	3	2	1	4	2	1	3	2	28	0.83
148	Hypopharynx	1	-	-	-	-	-	1	2	6	9	17	22	21	10	6	3	98	2.91
149	Pharynx, etc.	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.03
150	Oesophagus	-	-	-	-	-	-	2	2	9	15	27	34	44	40	28	13	214	6.36
151	Stomach	-	-	-	-	-	1	2	4	3	11	11	20	27	21	11	8	119	3.54
152	Small Intes.	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	2	0.06
153	Colon	1	-	-	-	1	-	1	3	3	6	2	4	8	8	5	1	43	1.28
154	Rectum	-	-	-	-	-	2	5	2	5	9	7	8	12	8	10	4	72	2.14
155	Liver	1	1	1	-	1	4	3	6	4	20	6	12	6	6	4	2	77	2.29
156	Gall bladder	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	1	4	0.12
157	Pancreas	-	-	-	-	-	1	1	3	4	5	7	6	1	3	-	1	32	0.95
158	Retroparit	-	-	-	2	-	1	-	2	-	-	-	4	1	2	1	-	13	0.39
159	Other dig. sy.	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.03
160	Nasal cavity	-	1	-	1	-	3	-	3	1	4	2	4	3	5	4	3	34	1.01
161	Larynx	-	-	-	-	1	-	3	4	4	13	20	45	31	31	17	18	187	5.56
162	Lung	-	-	-	-	-	2	4	7	30	38	58	93	69	63	35	31	431	12.82
163	Pleura	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	6	0.18
164	Thyruus	1	-	1	-	9	8	1	1	2	2	3	1	1	-	-	-	23	0.68
172	Skin, melan.	-	-	-	-	-	-	-	1	-	-	-	3	-	-	-	-	4	0.12
173	Skin, other	-	-	-	-	-	-	2	2	-	1	3	5	3	-	-	-	16	0.47
175	Breast male	-	-	-	-	-	-	1	2	-	1	-	-	-	-	-	-	4	0.12
185	Prostate	-	-	-	-	-	1	-	1	1	1	5	3	13	12	15	11	63	1.87
186	Testis	-	-	-	1	6	8	5	1	1	3	-	-	-	1	1	-	27	0.80
187	Penis etc	-	-	-	-	-	1	3	2	-	4	2	5	3	6	-	2	28	0.83
188	Uri. Bladder	-	-	-	-	-	-	-	-	-	3	5	6	9	8	9	8	48	1.43
189	Kidney	6	5	-	1	1	-	1	-	2	2	1	4	2	4	2	3	32	0.95
190	Eye	5	-	1	-	-	-	-	-	1	1	1	-	1	-	-	2	12	0.36
191	Brain	7	4	6	6	8	17	6	9	13	9	4	6	8	2	2	1	108	3.21
192	Nervous sy.	-	-	1	-	-	1	1	-	1	-	-	-	-	1	-	-	5	0.15
193	Thyroid GI	-	-	2	3	5	3	1	3	4	5	3	2	4	5	2	1	43	1.28
194	Other endo. GI	1	3	-	-	-	-	1	-	-	-	-	-	-	-	-	-	5	1.15
195	III def. site	3	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	5	0.15
196	Sec. Lymph N	-	-	-	-	1	2	2	3	2	8	9	19	16	9	8	7	86	2.56
197	Sec. Res. etc	-	-	-	-	1	1	1	6	2	9	4	9	6	12	6	5	61	1.81
198	Sec. other	-	-	-	-	-	-	3	4	5	11	7	16	10	8	5	7	76	2.28
200	Lymphosare	-	1	1	3	4	4	4	6	9	6	6	8	12	9	3	3	79	2.35
201	Hodgkins D	1	7	5	6	5	5	1	3	2	2	3	3	2	-	-	-	45	1.34
202	Oth. Lymph	-	-	2	1	2	4	5	7	8	13	11	8	11	12	8	2	94	2.80
203	Mult. Myel	-	-	-	-	1	-	-	2	2	4	6	6	6	8	3	6	44	1.31
204	Leuk. Lymph	36	14	19	11	8	8	5	3	2	2	3	1	2	1	3	1	119	3.54
205	Leuk. Myelo	2	5	3	5	9	5	4	5	2	6	6	5	5	6	1	3	72	2.14
206	Leuk. Monoc	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	0.03
208	Leuk. Uns	-	-	-	-	-	1	1	-	-	-	1	-	1	-	-	-	4	0.12
Total		67	47	56	62	74	84	87	129	184	324	325	498	466	436	285	240	3363	

56

57

TABLE 2
Regional Cancer Centre - Trivandrum: Cancer Cases of 1995 Age by Site - Females

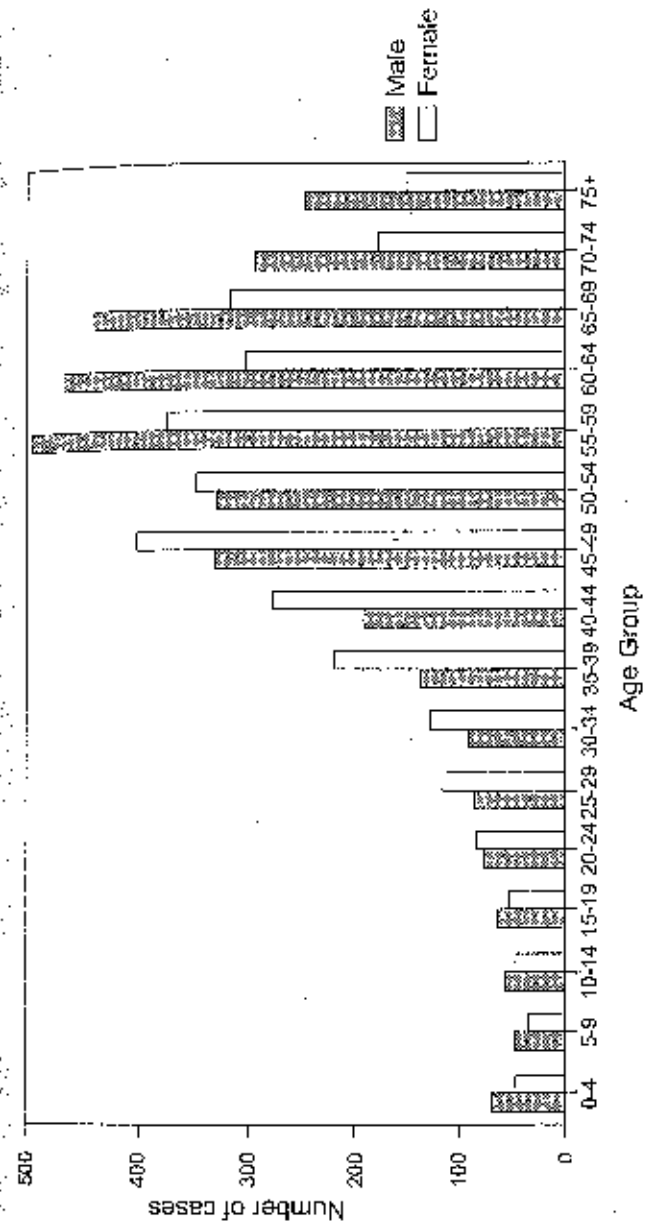
ICD	Site	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	Total	%
140	Lip	-	-	-	-	-	-	-	-	-	2	1	3	2	6	2	2	17	0.57
141	Tongue	-	-	-	-	-	-	2	2	10	9	15	21	19	25	15	18	136	4.54
142	Salivary G1	-	-	-	-	2	1	3	4	1	2	-	-	-	-	-	-	13	0.43
143	Gum	-	-	-	-	-	-	-	1	2	4	5	6	11	11	10	7	57	1.90
144	Floor of mouth	-	-	-	-	-	-	-	-	-	-	2	1	1	-	3	-	7	0.23
145	Other mouth	-	-	-	-	-	-	-	4	2	16	20	27	19	26	19	17	150	5.01
146	Oropharynx	-	-	-	-	-	-	-	-	2	5	1	-	-	2	-	2	12	0.40
147	Nasopharynx	-	-	-	2	1	-	-	1	2	1	2	-	-	-	-	1	10	0.33
148	Hypopharynx	-	-	-	1	-	1	1	-	1	7	1	3	4	3	1	-	23	0.77
149	Pharynx, etc.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	0.03
150	Oesophagus	-	-	-	-	1	1	-	2	3	7	9	6	1	10	3	2	45	1.50
151	Stomach	-	-	-	-	-	2	1	3	3	2	4	4	3	3	1	1	27	0.90
152	Small Intes.	-	-	-	-	-	1	-	2	-	1	-	1	-	-	-	-	5	0.17
153	Colon	-	-	-	-	-	2	-	3	4	1	6	3	2	4	-	-	25	0.84
154	Rectum	-	-	-	-	2	2	1	5	2	9	8	5	6	9	4	5	58	1.94
155	Livor	1	-	-	1	1	-	-	3	1	2	4	4	-	2	1	3	23	0.77
156	Gall bladder	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	1	3	0.10
157	Pancreas	-	-	-	-	-	-	1	3	4	3	2	3	3	1	1	-	21	0.70
158	Retoperit	1	-	-	-	-	-	-	1	1	2	-	1	1	-	-	-	7	0.23
160	Nasal cavity	1	-	-	1	1	-	-	1	-	3	4	1	2	2	5	3	24	0.80
161	Larynx	-	-	-	-	-	1	1	-	-	-	1	-	1	-	-	-	4	0.13
162	Lung	-	1	-	-	-	2	1	-	3	4	2	5	4	9	2	-	33	1.10
163	Pleura	-	-	-	-	-	-	1	-	-	-	1	1	1	-	-	-	4	0.13
164	Thymus	1	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	4	0.13
170	Breast	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
171	Endometrium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
172	Ovaries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
173	Cervix	-	-	-	-	-	1	7	24	52	88	65	25	65	71	46	28	324	10.50
180	Placenta	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.03
181	Body uterus	-	-	-	-	-	1	-	2	6	10	8	14	7	7	4	3	62	2.07
182	Ovary	-	2	1	8	10	14	9	15	22	24	19	19	24	12	7	5	119	3.98
184	Vagina	1	-	-	-	-	-	-	-	4	1	3	8	5	7	-	2	31	1.04
188	Ur. Bladder	-	-	-	-	1	2	-	-	-	2	-	1	-	3	1	1	11	0.37
189	Kidney	6	-	-	-	1	-	-	-	1	-	-	-	1	1	1	-	11	0.37
190	Eye	2	2	1	-	-	-	-	-	1	-	-	-	-	-	1	-	7	0.23
191	Brain	3	7	5	4	5	5	4	3	7	6	3	8	3	4	1	-	68	2.27
192	Nervous sy.	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	3	0.10
193	Thyroid G1	-	-	1	10	26	30	21	27	25	22	19	7	9	7	5	5	213	7.11
194	Other eno.GI	-	-	1	-	-	2	1	-	-	-	2	-	-	-	-	-	6	0.20
195	Ill def. site	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.17
196	Sec. Lymph No	-	-	-	-	-	-	1	1	2	2	2	3	6	3	1	4	25	0.84
197	Sec. Res. etc	-	-	-	-	-	-	-	1	1	3	2	6	3	4	2	-	22	0.73
198	Sec. Othor	-	-	-	1	1	9	1	2	2	5	3	7	3	4	3	4	39	1.30
200	Lymphosare	1	1	-	1	1	1	4	1	-	2	4	4	4	2	1	1	28	0.94
201	Hodgkins D	-	1	3	2	3	1	2	-	-	-	2	-	-	-	-	-	14	0.47
202	Oth. Lymph	2	1	1	3	4	3	1	2	3	6	8	1	4	6	2	4	51	1.70
203	Mult. Mycl	-	-	-	-	-	-	-	-	-	-	2	6	8	9	3	1	29	0.97
204	Leuk. Lymph	15	11	11	9	6	4	1	2	2	2	-	1	2	2	1	-	69	2.30
205	Leuk. Myelo	2	4	7	3	6	5	3	4	2	2	3	3	2	5	-	1	52	1.74
206	Leuk. Monoc.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.03
208	Leuk. UNS	1	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	3	0.10
	Total	45	33	47	53	81	112	121	212	270	399	312	368	293	306	189	141	2994	

TABLE - 3

Ten leading sites of cancer in male and females
Regional Cancer Centre, Trivandrum, 1995

Site	Male		Site	Female	
	No	%		No	%
Lung	431	12.82	Breast	703	23.4
Mouth	260	7.73	Cervix	524	17.5
Tongue	230	6.84	Thyroid	218	7.1
Lymphoma,HD	218	6.48	Ovary	191	6.3
Oesophagus	214	6.36	Mouth	150	5.0
Leukaemia	196	5.82	Tongue	136	4.5
Larynx	187	5.56	Leukaemia	125	4.1
Stomach	119	3.54	Lymphoma,HD	93	3.1
Oropharynx	111	3.30	Brain	68	2.2
Brain	108	3.21	Body uterus	62	2.0

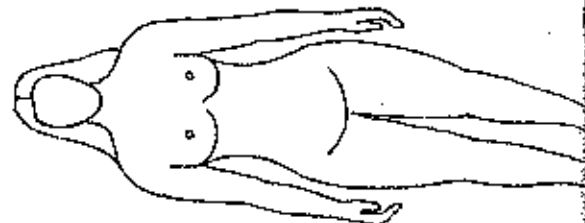

Fig. 1. Distribution of cancer cases by age group, 1995
(Male - 3863; Female - 2994)



REGIONAL CANCER CENTRE, TRIVANDRUM

SYSTEMWISE DISTRIBUTION OF CANCER CASES 1995

	%
3.4 BRAIN & NERVOUS SYSTEM	2.4
25.6 ORAL CAVITY & PHARYNX	14.2
1.3 THYROID	7.1
20.0 RESPIRATORY SYSTEM	2.3
0.2 BREAST	23.5
9.9 OESOPHAGUS & STOMACH	2.4
7.3 OTHER DIGESTIVE ORGAN	4.7
2.4 URINARY TRACT	0.7
3.5 REPRODUCTIVE SYSTEM	27.4
5.5 BONE,CONN.-TISSUE,SKIN	3.5
5.8 LEUKAEMIA	4.2
6.5 LYMPHOMA, HODGKINS DISEASE	3.1
8.6 ALL OTHERS	4.5

NATURAL BACKGROUND RADIATION
CANCER REGISTRY, KARUNAGAPPALLY,
KOLLAM DISTRICT.

(Financed by the Department of Atomic Energy, Govt of India till 1998
March)

- PRINCIPAL INVESTIGATOR** - DR. M KRISHNAN NAIR
- Co-Principal Investigator - Dr. N. Sreedevi Amma
Co-Investigators - Mr. P. Gangadharan,
Dr. V. Padmanabhan,
Dr. T. Gangádevi,
Dr. Paul Sebastian,
Dr. S. Parameswaran,
Dr. Jayaprakash Mádhavan,
Dr. Ravi Ankathil,
Dr. V.M. Pradeep,
Dr. Cherian Varghese
- BARC Collaborator - Dr. U.C. Mishra,
Director, Health Safety
& Environmental Group, BARC.

FIELD OFFICE: VAVVAKKAYU, KARUNAGAPPALLY TALUK

- Officer-in-charge - Ms. P. Jayalekshmy
(Sociologist)
- Cytotechnologist - Mr. K.S. Mani
- Senior Research Fellow (Statistics) - Mr. S. Jayadevan
- Junior Research Fellow (Physics) - Mr. S. Santhosh
- Radiation level measurements supervised by
Dr. Raghu Ram K. Nair

The objectives and study method as detailed in the 1996-1997 annual report of the Regional Cancer Centre, Trivandrum remained the same during 1997-1998. The progress achieved during 1997-98 is reported here under.

(a) Population enumeration

Field work of enumeration was completed for 12 panchayats. The enumerated population by end of 1998, March was 3,51,969. Persons missing during 1st round enumeration were traced and information collected from them. Processing of data obtained is ongoing.

(b) Radiation measurements

Scintillometer survey has been completed in 75064 houses (and except a few houses which were locked or unused, inside levels of radiation measurements have also been completed.

12 month Thermo-luminescent dosimetric (TLD) measurements been completed in 940 houses. In 645 houses, the dosimeters been placed and will be evaluated after the 12 month period expires. Analysis of soil to measure their Thorium, Uranium, Potassium levels ongoing and measurements have been completed for 165 soil samples and for 35 samples such measurements have to be completed. In house Radon-Thoron measurements using SSNTD technique has been completed (12 month measurements) in 284 houses and in 200 houses year long measurements are to be completed. Thoron-in-breath measurements have been completed in 105 individuals and in 25 persons these also to be completed. Data compilation, standardisation and analysis ongoing.

The scintillometer survey results of inside house levels of radiation are as follows. (Compiled by Dr. Raghu Ram K. Nair)

Radiation levels mGy/Yr		% of total houses in the taluk
< 1	mGy	21.2%
1-1.99	"	72.2%
5-9.99	"	5.1%
10-19.99	"	1.3%
20+		0.2%

672 houses have been identified as receiving more than 20 mGy annually. These and other measurements obtained including house occupancy of individuals will be used to calculate the radiation received by individuals. Association of such radiation with cancer occurrence will be critically assessed and evaluated statistically only after sufficient data collection is completed.

(c) Cancer registration

Using standard cancer registration methodology the Population Cancer Registry covering the entire population of Karunagappally is ongoing. This Population Cancer Registry is India's 2nd Rural Ca

Registry and Kerala's 1st Population Based Cancer Registry. The sources of data capture include hospitals and pathology laboratories, in Karunagappally taluk, Kollam town and Trivandrum. The Regional Cancer Registry records provide 50 to 55% of all cancer cases of the taluk. The death records kept in the 12 panchayats are yet another important source and are scrutinised regularly. As the death registration in the area is not complete, supplementary information is obtained through informal informants like PHC & Anganvadi workers and by visits to houses. During the 5 year period 1990-1994, 1644 incident cancer cases were identified among the resident population of the taluk. During 1995 & 1996, 765 incident cases including those reported as cancer deaths have been located. The processing of this information is ongoing and incidence rates will be obtained for this period very shortly.

The enormous data base of the Hospital Cancer Registry maintained since 1982 has been a very useful source for the registry operation.

(d) Assessment of cancer problem in Kerala

Using the cancer incidence rates obtained from Karunagappally taluk it is now possible to make an assessment of the cancer problem in Kerala. It is estimated that annually almost 30,000 cancer cases would be newly diagnosed in Kerala. This would result in 90,000 prevalent cancer cases yearly. Lung cancer is the leading cancer in males and among females cervix and breast are almost equally predominant sites for cancer in this rural population. From the data obtained it is seen that almost 45% of all cancer in male and 56% of all female cancers are amenable for prevention or early detection. (Fig.)

Prevalence of various forms of tobacco use has been obtained, almost 40% of male population above 50 years of age are tobacco-alcohol habitues. These are vital information for planning cancer control. The survival rates of various cancer types are being compiled.

(e) Cancer patient services

The facilities at the field office, Vavvakkavu have been extensively utilised for various patient services.

Monthly clinics were held regularly in which follow-up examination of old treated patients of the RCC was undertaken and only those who required further examination were asked to go to RCC, Trivandrum. Since the inception of the project 84 such clinics have been conducted and 2526 patients were examined. 41 field clinics were conducted in various

panchayats in which 308 new cancer patients were detected. Healthy persons have utilised the facilities for cancer screening. Hospitals in the taluk refer the patients or send material for cytology screening to the field office. This service has been immensely benefited for the taluk hospital patients who belong to the lower strata of the society. So far about 7000 specimens have been examined in the cytology laboratory in the project office.

(f) Distinguished visitors & International Co-operation

During the year Dr. Nakaya, an eminent cytogeneticist, Morihsima, Radiation researcher, Dr. Kato, Epidemiologist, Dr. A. Epidemiologist visited the study area and have offered co-operation to the Health Research Foundation, Japan.

The Health Research Foundation, Japan under Dr. Sugahara and other international research groups have been taking a keen interest in the population studies on Natural Background Radiation, Karunagappally. A similar study now ongoing in the High Natural Radiation area in China provides a unique opportunity for deriving meaningful conclusions on the health effects of such High Natural Radiation. These two studies also offer a broad base for comparing the dose effects of chronic exposure to humans to such High Natural Radiation with the effects of acute exposure received by the population exposed to Atom Bomb explosion and of Chernobyl and other nuclear accidents.

(g) Academic activities

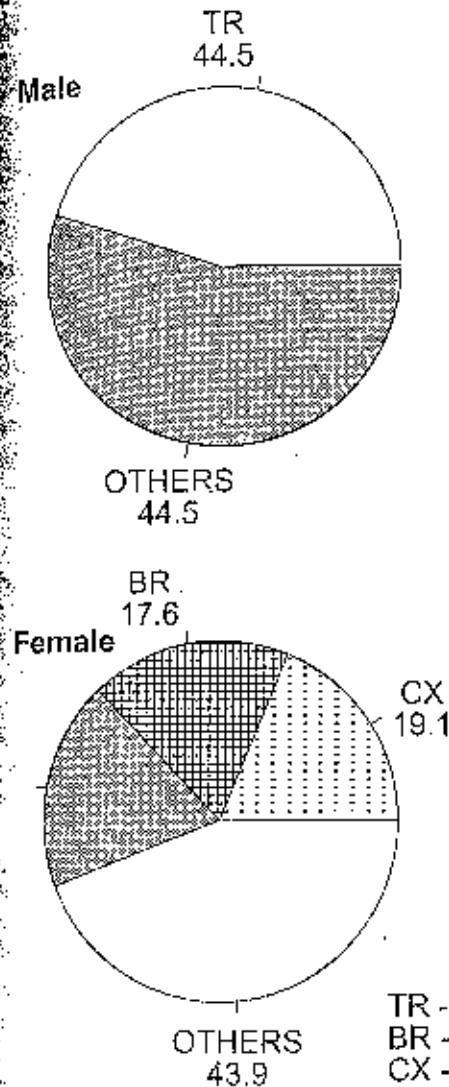
The facilities in the project have supported research work. Three Ph.D students working in the project are completing their doctorate programme. They are 1. Ms. P. Jayalakshmy (Sociologist) 2. Mr. Jayadevan (Statistics) 3. Mr. Santhosh (Physics). Requests for technical support from the project is also being received from the Kerala University department of Physics for research studies.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

Proportion of cancer cases amenable for prevention and early detection - Karunagappally



DIVISION OF RESEARCH

Dr. Prabha Balaram	- Addl. Professor
Dr. Ravindran Ankathil	- Assoc. Professor
Dr. S. Kannan	- Asst. Professor
Dr. P. Remani	- Asst. Professor
Dr. Molykutty John	- Asst. Professor
Dr. Thomas Abraham	- Scientific Officer

The unending quest for knowledge about the carcinogenic mechanisms, diagnostic and therapeutic modalities which could be beneficially adopted is the driving force behind the activities of this division. Attempts to quench this thirst was made through externally funded research projects (18 Nos. - total financial support of approximately lakhs) on various aspects of cancer biology. The basic and applied aspects complimented each other. The findings were published as papers (17) in national and international journals of repute and presented before national and international scientific community. The programme is continuing and is hoped to eventually provide valuable clues to the questions.

Research project

1. Immunobiology of Gestational Trophoblastic Disease and Correlation to tumour regression (1994-1997)

(Funded by Department of Science and Technology, Govt. of India)

Principal Investigator	Dr. Prabha Balaram
Co-investigators	Ms. Molykutty John, Dr.T.N.Rajalekshmi Dr.V.P. Gangadharan, Dr. Joy Augustine

This project was concluded this year. The major findings were overexpression of various growth factors such as the epidermal growth factor, transforming growth factor, the epidermal growth factor receptor, cytokines such as interleukin 1 alpha and beta, downregulation of the transforming growth factor beta, and no significant difference in the proliferative compartment as assessed by the percentage of Ki-67 and PCNA positivity and immunological status of the patient assessed by the helper/suppressor lymphocyte population, lymphocyte mitogen assay and cytotoxicity functions and alteration in the intensity and pattern of jack fruit lectin binding. The interesting observations were 1) the

potential of the serum β HCG levels (>300 mIU/ml) at four weeks of gestation when combined either with the lectin binding characteristics with the cellular atypia assessed from imprint smears to be a better prognostic indicator of persistence of the disease, 2) The observation there is a possible alteration of the EGF binding domain of the epidermal growth factor receptor (deletion/mutation), 3) possibility of a mechanism of cell accumulation rather than hyperproliferation (defective mitosis/cell arrest?) playing a role in this disease. The epidemiological aspects show higher incidence in this region, one of the highest in the world in low socioeconomic status, females belonging to O+ blood group and low incidence in females of the B+ blood group.

Role of viral genes, oncogenes and tumour suppressor genes in relation to aggressiveness in gestational trophoblastic diseases (1996-1999)

(Funded by the Council of Scientific and Industrial Research, New Delhi)

Principal Investigator	Dr. Prabha Balaram
Co-investigators	Dr. T.N. Rajalekshmi, Dr. Molykutty John

GTD is a group of diseases encompassing abnormalities of placenta with the benign but hyperproliferative hydatidiform mole at one end and the malignant choriocarcinoma at the other end of the spectrum. India has a comparatively high incidence rate of this disease ranging from 1.3 to 2/1000 deliveries with Kerala showing the highest hospital incidence. The aetiology and natural course of GTD still remains obscure and ill defined. Recurrent cases are rare and the disease is mostly related to individual pregnancies. The studies carried out last year in the serum showed the circulating antibodies to HSV in 19% of molar placentae and 12% of normal placentae while 0.7% of molar placentae and 0% of normal placentae showed the presence of circulating antibodies to HIV. Circulating antibodies to RSV was positive in 60% of molar placentae and 75% of normal placentae. The positive titre was much higher in the molar patient's sera with 11% of molar patients showing a titre of >500 in contrast to 3% in normal pregnant women suggesting a role of RSV in the molar placenta. The results suggest a possible viral association in GTD. Immunohistochemically, many of the tissues of molar (50-60%) and normal placentae (20-30%) were positive for the Respiratory syncytial virus antigen, human papilloma virus (20-30%) and herpes simplex virus II (10%)

antigens. Tissues were also analysed for the expression of cell cycle regulatory genes in order to understand the process of cell proliferation and accumulation. Evaluation of p53 protein showed that it was almost always expressed in the normal and the molar placenta while the Rb protein was expressed at a higher rate in the molar placenta. c-myc and bcl2 were equally expressed in both the normal and molar placental tissue again suggesting that the proliferative rate is not very different in the two tissues. The erbB2 protein which is homologous to the epidermal growth factor receptor was also overexpressed in the molar lesions. The preliminary observations suggest a possible accumulation of cells due to a cell arrest in the G1 phase brought about by the Rb proteins and the transforming growth factor beta. We expect to get an answer to this by the end of the study.

The p53 protein expression showed close relation to the progression of the disease with persistent disease showing higher expression of p53 and c-myc expression was altered with alteration of the Rb protein expression. The expression of antimetastatic protein nm23, anti-apoptotic gene bcl2 and the signal transducing protein ras p21 are being evaluated in these lesions.

3. Genomic instability in relation to progression in oral cancer and precancers. (1996-1999)

(Funded by the Board of Research in Nuclear Sciences, Dept. Atomic Energy, GOI)

Principal Investigator Dr. Prabha Balam

Co-Investigators Dr. K. Ramdas, Dr. K. Ratheesan

Dr. K.R. Nallakumary, Dr. Anita Balam

The expression of p53, Rb and c-myc proteins were evaluated in oral precancers and cancers in order to assess their involvement in malignant transformation and relation to habits. Expression of Rb and c-myc appeared to be related to malignant transformation more than alteration in the p53 gene with the expression of Rb protein being downregulated with the carcinomatous changes. It was interesting to note that in patients with the precancerous lesions of the oral cavity, that while the Rb protein expression was affected by both the chewing and alcohol habits, the p53 protein expression was affected only by chewing and smoking habits and not by alcohol usage. Such a correlation was not evident in the cancer cases possibly due to the stoppage of habits once the patient is aware of his disease. However in few patients (3/82) the p53 was strongly expressed. The relation is being studied further for the nature of the alteration in these genes. Eventhough the c-myc gene

expression showed a correlation with the expression of the p53 gene, it did not show any difference based on the results so far available suggests that p53 activation/mutation is related while the Rb protein expression is affected both by tobacco and alcohol and these genes are affected much more than the c-myc gene in oral cancer.

Molecular epidemiology of cancer of the oral cavity and oropharynx: A multicenter case-control study (1996-1997).

(Funded by the International Agency for Research on Cancer, Lyon)

Principal Investigators Dr. Prabha Balam,
Dr. Nubia Munos (IARC)

Co-Investigators Dr. K. Ramdas, Dr. K.R. Nalinakumary,
Dr. Elizabeth Abraham

The study was carried out to analyse the prevalence of human papilloma virus in oral cancer patients and hospital controls. The study involves samples from 5000 oral cancer patients and an equal number of age and sex matched hospital controls from 28 countries, 600 of them from 3 centres in India, namely, Trivandrum, Madras and Bangalore. The prevalence of HPV and its subtype infection is to be correlated with patient characteristics such as age, sex, habits, (tobacco, alcohol use), associated infections, sexual behaviour etc. The HPV analysis is to be carried out by Dr. Wallboomer, Section of Molecular Pathology, Free University Hospital, Amsterdam. The preliminary evaluation was done on cells from buccal smears which was not seen to be the right sample for the analysis. Biopsies are being analysed. HPV positivity was seen to be much lower in buccal smears in comparison to the biopsies.

Genomic instability in breast cancers (1998-2000)

(Partly funded by Department of Science, Technology & Environment, Govt. of Kerala)

Principal investigator Dr. Prabha Balam

Co-investigators Dr. Iqbal Ahmed, Dr. Elizabeth Abraham

The study was started in order to evaluate the nature of genomic instability observed in patients with cancer and benign lesions of the breast. The major parameters being analysed are the alterations in the cell cycle regulatory genes, the apoptotic and proliferative indices, the metastatic potential, the inherent DNA damage repairing capacity by comet assay, and the status of the BRCA1 and BRCA2 genes using PCR and SSCP analysis. A total of 122 lesions have been evaluated. Since the numbers in each group is low for a proper analysis, the study is being continued.

6. Genetic susceptibility studies in breast/ovarian cancer families (1997-2000).

(Funded by the Department of Science and Technology, Govt. of India)

Principal investigator Dr. Ravindran Ankathil
Co-investigator Dr. Thomas Abraham
Dr. Jayaprakash Madhavan,
Dr. V.P.Gangadharan

At the Regional Cancer Centre, Trivandrum several families have been identified in which cancer of the breast/ovary aggregate. Inheritance of susceptibility gene BRCA1 located on the chromosome 17q has been reported to be the basis of this familial occurrence. But information is lacking concerning possible genetic defects or genetic susceptibility in close relatives of the so called cancer families. This study aims to develop a sensitive and practical genetic assay by which genetically susceptible high risk relatives in breast and ovarian cancer families can be specifically identified and distinguished from their low risk relatives. These family members will be analysed at the molecular and cytogenetic levels for genetic susceptibility markers. At the molecular level, germline BRCA1 mutations in affected members in these cancer families will be investigated employing polymerase chain reaction single strand conformation analysis(PCR-SSCP). At the cytogenetic level, constitutional chromosomal abnormalities, chromosomal fragile sites, mutagen induced chromosomal sensitivity shall be investigated employing peripheral blood lymphocyte microcultures.

7. Evaluation of hematological and cytogenetic response of interferon treatment in CML patients (1997-1998)

Investigators Dr. Ravindran Ankathil
Dr. V.P.Gangadharan, Dr. N. Geetha

Chronic Myeloid Leukemia(CML) is characterised cytogenetically by the reciprocal translocation t(9;22) (q34;q11). This results in a derivative chromosome 22, the Philadelphia (Ph⁺) chromosome, which is present in 90-95% of CML patients. Ph⁺ chromosome serves as a marker for the malignant clone and allow the cytogenetic diagnosis and follow up of the disease. Recently, Interferon alpha therapy has been useful in suppressing a relapse of Ph⁺ positive cells. Interferons have the potential to delay progression in the chronic phase and with the definitive suppression of cytogenetic clonal evolution, provide effective treatment of more advanced stages of the disease. This study aims to evaluate the hematological and cytogenetic response of interferon alpha treated CML patients.

8. Chromosome sensitivity studies in colon cancer families (1994-1997)

(Funded by Dept. of Science, Technology and Environment, Govt. of Kerala)

Investigators Dr. Ravindran Ankathil,
Dr. Jayaprakash Madhavan

This project has been just completed. During the tenure of the project we have registered and analysed the pedigrees of all the colorectal cancer (CRC) patients with a family history of cancer. We have identified 23 CRC families in which 2,3 or more first or second degree relatives were also affected with the disease. But there is paucity of information on the genetic determinism for familial CRC predisposition. Therefore, we have investigated constitutional chromosome abnormalities and bleomycin induced chromosome sensitivity of 26 familial and 30 sporadic colorectal cancer patients, 60 unaffected family members (first/second degree relatives) and 30 normal healthy controls to determine whether these parameters could give any clue to genetic predisposing factors by which the high risk members in CRC families could be identified. The test assay used bleomycin induced chromatid breaks in short term microcultures of peripheral blood lymphocytes of the subjects. The CRC patients, the unaffected family members and the controls did not show any constitutional chromosomal abnormalities. However, with regard to bleomycin sensitivity there was significant difference between the CRC patients, unaffected relatives and controls. The mean break/cell values of 1.62 ± 0.42 for the FCRC patients and 1.08 ± 0.34 for the SCRC patients were significantly higher than the mean b/c values of 0.62 ± 0.18 for the unaffected relatives and 0.52 ± 0.12 for the controls (p<0.001). The noteworthy observation was that six unaffected members from 6 CRC families also showed bleomycin hypersensitivity at the initiation of therapy. Because they expressed mean b/c values >1.0 which was as high as those of the patients they were regularly followed up. Out of these 6 developed CRC later. This clearly demonstrated that mutagen hypersensitivity among unaffected relatives in CRC families may be related to cancer predisposition. Hence this cytogenetic assay could be utilised to identify the genetically high risk individuals in CRC families.

9. Establishment of a Familial Cancer Registry (1995-2000)

Investigators Dr. Ravindran Ankathil,
Dr. Aleyamma Mathew
Ms. Latha P.T, Ms. Anitha Nayar
Dr. M. Krishnan Nair

Virtually all forms of cancer in humans show a tendency to aggregate in families and familial cancers comprise a significant fraction of the cancer burden. The family history analysis is an easily accepted and very productive method for identification for familial cancer clusters. We have started taking details of family history of cancer among all the patients registered in our centre. The study is being continued with the following objectives.

1. To investigate the incidence of familial cancers at the Regional Cancer Centre through pedigree analysis.
 2. To compile the pedigrees and estimate the relative cancer risk of the family members
 3. To establish a registry for familial cancers.
10. **Etiopathological studies in Hodgkin's Disease with special emphasis to the role of Epstein Barr Virus (1996-1999)**

(Funded by Kerala State Department of Science and Technology)

Investigators Dr. Ravindran Ankaithil
Co-Investigators Dr. Elizabeth Abraham,
Dr. Joy Augustine

During the second year of the project, serological study to determine the antibody titres against Epstein Barr viral antigen in Hodgkin's Disease (HD) was undertaken. A total of 82 HD patients consisting of 48 adult and 12 pediatric cases were included. For comparison, 85 age and sex matched healthy normal controls were also included. 8 out of 82 patients (98%) and 57/85 (67%) had IgG antibody titres against EBV capsid antigen. The geometric mean titre (GMT) for patients was 1:320 and the GMT for controls was 1:35. Only one control showed a titre of 1:320 and 7 controls had a titre of 1:160. Thus 87% of patients had antibody titres >160. Compared to controls, HD patients had significantly higher IgG antibody titres against EBVCA ($p < 0.001$). Serum of patients with nodular sclerosis and lymphocyte predominant subtypes showed lower antibody (GMT 1:345) titres than those with mixed cellularity and lymphocyte depletion subtypes (GMT 1:583). Patients with advanced disease (stages III and IV) had higher IgG antibody titres against EBVCA (GMT 1:617) than those with limited disease (GMT 1:315). Patients in the 15-34 and above 50 age group had higher IgG antibody titres against EBVCA than those in the 0-14 years and 35-49 years. But there was no difference in the EBV antibody titres with respect to the gender of the patients. IgG antibody titres against VCA for females and males were GMT 1:470 and GMT 1:460 respectively.

11. **Cell membrane changes in relation to tumour progression, invasion and metastasis in Oral and Breast cancers using lectins (1996-99).**

(Funded by Dept. of Science, Technology and Environment, Govt. of Kerala)

Principal Investigator Dr. P. Remani
Co-Investigator Dr. Elizabeth Abraham

The formation of distant metastasis involves several discrete steps that depend on a complex array of cellular interactions between tumour and host cells. Many of these interactions are mediated through surface molecules. The normal and malignant invasive squamous epithelial cells synthesize and secrete the glycoconjugates including glycoproteins, glycolipids and gangliosides on to the cell membrane surfaces. Lectins have been shown to have specific affinity for complementary binding sites on terminal sugars. Linked to horse radish peroxidase the lectins have been used to localize terminal sugars in the tumour and sections. In this study, our aim is to investigate staining properties of primary oral and breast cancer tissues with Jack fruit lectin and Peanut lectin to see whether these lectins can be used to predict the distant metastasis of tumours. Scrape smears from 66 patients with squamous cell carcinoma of the oral cavity were used for the study. The number of tumour cells with membrane staining was noted and expressed as percentage. The frequency of lectin binding cells varied among the 66 tumours studied ranging from 53% to 100%. In 52 patients, >85% of the tumour cells showed lectin binding whereas in 14 patients, < 85% of tumour cells showed lectin binding.

12. **Lectins as diagnostic markers in haematological malignancies (1994-1997).**

(Funded by Dept. of Science, Technology and Environment, Govt. of Kerala)

Principal Investigator Dr. P. Remani
Co-Investigators Dr. P. Kusumakumary,
Dr. G. Rajasekharan Pillai

Two lectins, namely Jack fruit lectin and Peanut lectin, were isolated from the seeds of *Artocarpus integrifolia* and *Arachis hypogaea*. These lectins were then purified using specific sugar immobilized columns. The purified lectins were then conjugated to horse radish peroxidase and used for tissue staining studies of different types of leukemias and

lymphomas. Imprint smears and histology sections from 63 lymphoma cases (Non Hodgkin's lymphoma, Hodgkin's lymphoma, Granulosa cell lymphadenitis, Reactive follicular hyperplasia) and 154 cases of leukemia (Acute Myeloid Leukemia, Acute Lymphoblastic Leukemia, Chronic Lymphocytic Leukemia, Chronic Myeloid Leukemia) were used in this study. The results of the lectin binding studies showed that in Hodgkin's disease histiocytes and epithelioid cells showed intense staining. Reed Sternberg cells showed binding of moderate degree. Immunoblasts showed only weak staining and could be readily distinguished from Reed Sternberg cells. In Non Hodgkin's lymphoma lymphocytes did not show any staining. The cleaved cells on follicular lymphoma showed moderate staining as compared to the similar cells in non neoplastic lymphnodes. Vascular endothelial cells showed a more intense staining than that was observed in reactive lesions. Lectin binding in different types of leukemias also showed different binding patterns. ALL and CLL cells did not show any staining whereas myeloid leukemias showed varying degrees of membrane and cytoplasmic staining especially in M1, M2, M3 and M4 subtypes.

13. Development of multifactorial index of Radiocurability of Oral Cancers (1993-1997)

(Funded by Dept. of Science, Technology and Environment, Govt. of Kerala)

Principal Investigator

Dr. V.N. Bhattathiri

Co-Investigators

Dr. P. Remani, Dr. B. Chandralekha,

Mr. C.A. Davis,

Dr. Aleyamma Mathew

Smears, pre-treatment alone or serially during radiotherapy, taken from squamous cell carcinomas of oral cavity were studied for quantification of nuclear abnormalities and cell membrane lectin binding patterns. Around two hundred patients were available for pretreatment study and various numbers for serial studies. Analysis regarding the relation of the above parameters to proliferative, invasive and metastatic capacity of the tumours and their radiosensitivity showed the following important findings:

1. Micro/bi/multinucleation and nuclear budding are markers of cell proliferation and related to tumour growth in size. Micronucleation is a better marker for this than the conventional mitotic index.
2. Multinucleation, which is due to failure of cytokinesis after karyokinesis, is linked to cell membrane damage and its failure to keep up with nuclear proliferation and hence is a marker of both cell proliferation and membrane lability.

The lectin binding characteristics of cells from tumours with high lymph node metastatic potential were different. When these characteristics are integrated with other usual factors influencing lymph node involvement, the usefulness for such prediction is increased.

Like nuclear abnormalities showed significant dose related increase during radiotherapy.

Even though micronucleation was higher in radio-sensitive tumours, it was not statistically significant, suggesting that their use alone is unlikely to have predictive value.

Multinucleation was significantly higher in sensitive tumours than resistant ones. Combined evaluation of the various parameters can probably identify sensitive tumours halfway through a course of treatment.

Sensitivity of the cell membrane in combination with fast nuclear proliferation, is what makes a tumour radiosensitive or otherwise.

Tumours with high propensity for lymphnode involvement have complex cell membrane and hence they are more radiosensitive.

Rate of change of micro/bi/multinucleation and the plateauing in counts during radiotherapy can identify the presence of radiation induced accelerated proliferation in tumours, and this is linked with their radiocurability.

Erythrocyte agglutination by lectins may be an in vitro model to study factors influencing cell membrane sensitivity.

Evaluation of AgNOR, Transferrin and radiation Induced micromultinucleation as indices of proliferation and radiosensitivity of oral cancers (1997-2000)

(Funded by Dept. of Science, Technology and Environment, Govt. of Kerala)

Principal Investigator

Dr. V.N. Bhattathiri

Co-Investigators

Dr. P. Remani, Dr. K. Jayasree

Dr. B. Chandralekha, Mr. C.A. Davis

The main objectives of this study is to assess whether the silver stained nucleolar organizer region associated proteins, transferrin receptors and micromultinucleoli can be used as the markers to predict the radiosensitivity of oral cancers.

15. Evaluation and classification of radiation induced immediate nuclear and cytoplasmic changes in oral epidermal carcinoma cells (1987-1999)

(Funded by Dept. of Science, Technology and Environment, of Kerala)

Principal Investigator Ms. L. Bindu
Co-Investigator Dr. V.N. Bhattathiri

Radiation is known to cause damage to the nucleus and cytoplasm of cells exposed to it resulting in cell death. Many of these changes can be identified by morphological changes. Modes of death, like apoptosis and newer changes in morphology has been described. Many of these changes have not been evaluated by cytology. The relation of these to radiation dose and time has not been evaluated. The purpose of this study is to investigate the various changes in detail cytologically or histopathologically and classify them. Hundred patients with oral carcinoma were included in the study. They will be given fractionated radiotherapy. Smears will be taken from the tumour avoiding the normal tissue, before the start of treatment and after the delivery of fractions of radiation. Smears from each patient will be studied. The smears will be stained with Giemsa's and the various nuclear and cytoplasmic abnormalities seen. Some of these abnormalities are, nuclear budding, micronuclei, multinucleation, apoptosis, karyorrhexis, karyolysis, cytoplasmic vacuolation, cytoplasmic granulation etc. For this 50 cells will be selected to study radiation related changes. In each cells separately scored.

16. Biological Prognostic Markers in Oral carcinoma (1997-2000)
(Funded by Indian Council of Medical Research)

Principal Investigator Dr. S. Kannan
Co-Investigators Dr.V.N. Bhattathiri
Dr.Elizabeth K. Abraham,
Dr.K.R. Nallinakumari

The treatment response and survival rate in oral cancer patients vary widely from one patient to another. The present clinical as well as pathological features of the lesions possess only limited ability to predict treatment response. In order to assess the biological behaviour of the tumour and for individualized management, the present study proposes to analyze a set of proteins involved in the crucial steps of carcinogenesis as prognostic markers in oral carcinoma. The proteins such as p53, CDK-2, CDK-4, CDK-6, p21, p16, Cyclin D1, Cyclin E, VEGF and

being immunohistochemically analyzed in the pre-treatment biopsy. In addition to this, also the relation between apoptosis and prognosis of oral lesions is being studied by analyzing the expression pattern of bcl-2, pax and also DNA fragmentation by TUNEL method. The initial results showed that certain proteins have some significant relation with the response of tumours and also have some correlations with certain histopathological factors.

17. Expression pattern of Various Growth Factors and Growth Factor Receptors In Oral Pre-malignant and Malignant Lesions (Completed)

(Funded by Department of Science and Technology, Govt. of India)

Investigators Dr. S. Kannan,
Dr. G. Jagadeesh Chandran
Dr. K. Raveendran Pillai,
Mr. Sujathan
Dr. Babu Mathew,
Dr. K.R. Nallinakumari
Dr. M. Krishnan Nair

The expression of proteins involved in signal transduction pathways are shown to be altered in various malignancies and this alterations can also be used as markers for tumor progression. The present study analyzed the expression pattern of certain growth factors and growth factor receptors in various stage of tumour progression in oral mucosa in order to study the relation of these proteins with oral carcinogenesis. The tumour progression stages analyzed includes normal mucosa, non-dysplastic and dysplastic leukoplakias and frank invasive oral squamous cell carcinomas. The expression pattern of epidermal growth factor (EGF) protein receptor (EGFR), transforming growth factor -alpha & beta-3 (TGF- β 3), c-erbB2 product (Neu) and insulin like growth factor-1 receptor (IGF-1R) were studied by immunohistochemistry.

Immunohistochemical staining showed that all these proteins exhibit inconsistency in expression in different oral lesions except EGFR. Multivariate analysis between the expression pattern and stage of tumor progression revealed that EGF, TGF, Neu, TGF- β 3, IGF-1R, have significant correlation coefficient. In multivariate analysis only EGF, TGF and TGF- β 3 were showed to have independent role on tumour progression in oral mucosa. When analyzing the association between the expression pattern of these proteins and proliferative status, IGF-1R,

EGFR and TGF-β3 showed significant correlation in univariate analysis and in multivariate TGF-β3 alone showed independent association with cell proliferation. Thus the present results indicate that the expression pattern of TGF-β3 may be a useful biological marker to assess the lesions.

18. Role of Cathepsin D in Gestational Trophoblastic Disease

(Funded by Science & Technology, Govt. of Kerala)

Principal Investigator Dr. Molykutty John
(Young Scientist award project for the year 1997)

The expression of Cathepsin D was studied in 45 trophoblastic tumours and 38 normal placental tissue of corresponding gestational ages including spontaneous abortion cases. Extensive and granular cytoplasmic immunostaining was noted in both cyto and syncytiotrophoblastic cells in nearly all cases of placental tissue, spontaneous abortion cases and in hydatidiform mole. A statistically significant increase is noted between normal placental tissue and trophoblastic tumours. There was also statistically significant difference in the intensity of proportion of cell staining of both villous stromal cells and decidua between normal pregnancy and molar pregnancy. Correlation of staining score to the regression pattern of the tumour showed that lesions of the slowly regressing cases showed slightly higher cathepsin D expression when compared to spontaneously regressing groups. A similar phenomenon was noticed with lesions in the chemotherapy group. The strong immunoreactivity for cathepsin D in trophoblastic tumours suggest its role in trophoblastic cell transformation, proliferation and invasion. The activities may be important both in higher rate of proliferation and in the maintenance of the higher proliferative rate in trophoblastic tumours.

Projects recently sanctioned

1. Antimetastatic protein NM23 and adhesion protein molecule CD44 in breast cancer

(Funded by: Department of Science, Technology and Environment, Govt. of Kerala)

Investigators Dr. Prabha Balaram,
Dr. Iqbal Ahamed
Dr. Elizabeth Abraham

2. Evaluation of metastatic potential in GTD using adhesion proteins and antimetastatic genes as indicators

(Funded by: Indian Council of medical Research, New Delhi)

Investigators Dr. Prabha Balaram, Dr. Molykutty John

Expression of epidermal growth factor and transforming growth factor alpha in relation to aggressiveness in GTD
(Funded by: Indian Council of Medical Research, New Delhi.)

Investigators Dr. Molykutty John,
Dr. Prabha Balaram,
Dr. Chandrika Devi

Academic Credits

Dr. Prabha Balaram

Thesis evaluated

Member and Ph.D Examinership - Mahatma Gandhi University, Kerala 1

- Calicut University, Kerala 1

Member Examinership - Bombay University, Bombay 1

Member for projects and publications 1997-98

Indian Council of Medical Research, Govt. of India
Council of Scientific and Industrial Research, Govt. of India
Department of Science and Technology, Govt. of India
Biosciences Journal
Biomedicine Journal

Member: Selection panel for staff

Regional Cancer Centre, Trivandrum
Tropical Botanical Garden and Research Centre, Palode, Trivandrum.

Evaluation committee Member - Research Fellow

Rajiv Gandhi Centre for Biotechnology, Trivandrum.

Assistant Editor - Biomedicine

Executive Committee member - Indian society for Radiation Biology
Courses conducted -
Two month Immunology training for M.D. Microbiology students, Medical College, Trivandrum - Annual.

Dr. Revindran Ankathil

Member Examinership - Calicut University

Remani P*M. Phil Examinership*

- Mangalore University

Research Supervision**Dr. Prabha Balaram**

1. Genomic Instability in breast cancer Ongoing doctoral thesis programme - Ms. Priya Sri
2. Molecular biology of Gestational Trophoblastic disease Ongoing doctoral thesis Programme - Ms. Swapna E
3. Molecular alterations in oral cancer with special emphasis on oncogenes and tumour suppressor genes Ongoing doctoral thesis programme - Ms. Prishla Varghese
4. p53 tumour suppressor gene in oral Precancers and Cancer - A clinico pathological study MDS Thesis - Dr. Suma Samuel
5. Antithrombin III levels in pregnancy induced hypertension MDS Thesis - Dr. E.M. Kos
6. Immunomodulatory effect of selected regimes in rheumatoid arthritis MDAyurveda Thesis - ayurvedic treatment Dr. Mini B.S

Dr. Ravindran Ankathil

1. Cytogenetic and epidemiological studies in breast and colorectal cancer families Thesis submitted - Jyothis
2. Etiopathological studies in Hodgkin's lymphoma Ongoing doctoral thesis programme - Chandini R
3. Genetic susceptibility studies in breast/ovarian cancer families Ongoing doctoral thesis programme - Vinodkumar B
4. Cytogenetic and hematologic response in studies of biotherapy in patients with hematological malignancies Ongoing doctoral thesis programme - Hariharan
5. Genetic studies of patients suffering from recurrent aphthous ulcers Ongoing MDS Programme - Dr. Manoj .S. Nair

Awards

Dr. Ravindran Ankathil Raja Ravi Sher Singh of Khalsla memorial award for cancer research in 1996 instituted by Indian Council of Medical Research, 1997.

Molykutty John

1. Ph.D Degree awarded In January 1998.
2. Awarded American Cancer Society Fellowship for Beginning Investigators (ACSBI) fellowship of UICC for 12 months (March 1988).

Routine Investigations undertaken

1. Karyotyping from peripheral blood lymphocyte Microcultures - 292
2. Bonemarrow karyotyping - 152
3. Serum Immunoglobulin estimation
 - IgG - 390
 - IgM - 390
 - IgA - 390

Conferences, etc. attended - (Chapter III)**Papers Presented - (Chapter IV)****Papers Published - (Chapter V)**

DIVISION OF LABORATORY MEDICINE TUMOUR BIOLOGY

Dr. M. Radhakrishna Pillai - Assoc. Professor

The department continues to direct basic and translational research programs towards prevention, control and cure of cancer. Research programs are being continually funded by extra mural funding agencies after peer review, at times where support for such investigations is increasingly constrained. The mechanisms regulating tumor growth and programmed cell death continued to be the focus of research. Significant advances have been made in the understanding of relationships between tumor associated gene function, apoptosis and treatment outcome.

Breast cancer research is a substantial activity in the department. Despite all current research into newer treatment protocols and therapeutic agents, it is a well known fact that such lines of investigation are unlikely to make any major impact on breast cancer control and management. For any major breakthrough or achievement, the basic and molecular biology of the disease needs to be correctly defined. Recent evidence has emphasized the importance of programmed cell death or apoptosis in the maintenance of tissue homeostasis. Pathogenesis of tumors and response to therapy. Programmed cell death is a genetically regulated process of cell death or cell suicide, normally occurring after completion of a fixed life span or after the cells are genetically damaged. An inverse correlation was observed between bcl-2 gene expression and the extent of apoptosis. The extent of apoptosis directly correlated with p53 protein accumulation, p53 gene mutation, tumor cell proliferation, histopathological grade, tumor size and lymph node status. There was no statistically significant association between estrogen and progesterone receptor status and apoptosis. In addition, the TNM stage of the disease correlated with immunoreactivity of p53 and Ki-67. Bcl-2, by inhibiting apoptosis may cause a shift in tissue kinetics towards the preservation of genetically aberrant cells thereby facilitating tumor progression. The ability of apoptosis also occur in the presence of mutant p53 protein suggests the existence of at least two p53 dependent apoptotic pathways, one requiring activation of specific target genes and the other independent of it. We will now correlate these results to treatment response in these patients.

Oral cancer continues to be the leading malignancy seen in India. Research into the development of oral cancer continued with investigations into the cellular alterations seen during oral carcinogenesis. A significant correlation was observed between the extent of angiogenesis mediated by CD34 expression and histology of the lesion. An inverse correlation was observed between CD34 expression and apoptosis and expression of the apoptosis stimulating bax protein. Inverse correlation was also evident between the bax/bcl-2 ratio and CD34 immunoreactivity. Presence of mutant p53 also showed a correlation to the extent of angiogenesis. These results suggest that angiogenesis increases as histological abnormality increases in the oral mucosa. The correlation between CD34 expression, cyclin D1 and TUNEL reactive cells suggest that increased angiogenesis, decreased apoptosis and deregulated proliferation occur simultaneously during tumor progression in the oral mucosa. Presence of a mutant p53, increased bcl-2 expression and altered bax expression are also involved in this complex process.

We have had continued success in our human papillomavirus (HPV) and cervical cancer research program. The relationship between apoptosis, apoptosis regulatory proteins, cell proliferation and human papillomavirus infection during various phases of tumor progression in the uterine cervix was investigated. Apoptosis showed significant negative correlation with increasing histological abnormality. Higher tumor cell proliferation was also associated with increasing histological abnormality. There was significant correlation between histological grade and immunoreactivity of p53 and bcl-2. However mutant p53 was seen in only 5% of samples analyzed. Expression of Bax and the bax:bcl-2 ratio showed an inverse correlation to histological grade. There was also an inverse correlation between extent of apoptosis and immunoreactivity of p53. A significant positive correlation between expression of the bax protein and apoptosis was evident. Presence of HPV DNA detected by PCR significantly correlated to the extent of histological abnormality. High risk HPV - E6 protein also showed this significant correlation. There was an inverse correlation between apoptosis and HPV infection. High risk HPV infection was associated with decreased apoptosis and also increased cell proliferation. Lowest levels of bax:bcl-2 ratio was also associated with HPV 16 and 18 infection. Modulation of apoptosis and apoptotic regulatory proteins by high risk HPV infection may therefore be an important factor in the development of cervical cancer.

We have also studied the role of the ras group of oncoproteins in the development of colorectal tumors. Expression of the ras oncoprotein product p21 and Jack fruit lectin (JFL) binding were analyzed in normal rectal tissue, adenomas and carcinomas. Mild expression of ras p21 was observed in 50% of the normal rectal tissue samples. In adenomas, the expression of three types of ras proteins ranged from mild to moderate. The expression of N - ras p21 was maximum in the carcinoma cases with 91% of samples showing immunoreactivity. K - ras p21 was seen in 58% of the cases while H - ras p21 expression was seen in 50% of the cases. Correlation analysis revealed significant association between positive p21 immunoreactivity and increasing histological abnormality. JFL binding on the other hand, was found to be reduced with increasing histologic abnormality. Normal rectal epithelium showed intense binding with over 60% cells showing a positive reaction. Adenomas were seen to have moderate to intense staining with a range of 30 - 60% positive cells. Lowest levels of JFL binding was associated with invasive tumors. A significant negative association was thus evident between JFL binding and histological abnormality. A negative correlation was also evident between expression of N - ras and K - ras oncoproteins and JFL binding. These results suggest that ras oncoprotein expression during rectal tumorigenesis is accompanied by cell surface glycoprotein alterations.

Other areas of work ongoing include the radiobiology research program and in vitro molecular chemosensitivity assay development. The radiobiology program funded by the International Atomic Energy Agency was completed and results submitted for publication.

Research projects (1997-98)

1. The mutant p53 protein in breast cancer.

(Funding Agency : Kerala State Committee for Science, Technology & Environment).

Principal Investigator Dr M. Radhakrishna Pillai

2. Cellular manifestations of p53 and bcl-2 expression in ovarian cancer.

(Funding Agency : Indian Council for Medical Research).

Principal Investigator Dr. M. Radhakrishna Pillai

3. Tumor response to radiation therapy in carcinoma of the uterine cervix : the role of ras gene mutation

(Funding Agency : Indian Council for Medical Research).

Principal Investigators Dr. M. Krishnan Nair,
Dr M. Radhakrishna Pillai

Radiosensitivity, treatment outcome and ras gene mutation in rectal carcinoma.

(Funding Agency: Department of Atomic Energy, Govt. of India)

Principal Investigators Dr. Jayaprakash Madhavan,
Dr. M. Radhakrishna Pillai

Molecular Regulation of Programmed Cell Death.

(Funding Agency : Department of Science & Technology, Govt. of India)

Principal Investigator Dr M. Radhakrishna Pillai

Programmed tumor cell death and proliferative fraction ratio in the staging of thyroid cancer.

(Funding Agency : Indian Council for Medical Research).

Principal Investigators Dr V.M. Pradeep,
Dr M. Radhakrishna Pillai

Telomere dynamics, telomerase activation and epithelial tumor progression.

(Funding Agency : Council for Scientific and Industrial Research).

Principal Investigator Dr M. Radhakrishna Pillai

Human Resource Development

The following two candidates completed their doctoral program and submitted theses to the University of Kerala.

Ms. S. Lakshmi : Patho-biological factors in cervical oncogenesis

Ms. S. Asha Nair : The histogenesis of squamous cell carcinoma of the uterine cervix

The division has currently one Post doctoral trainee and 6 PhD candidates working in the Doctoral Programme of the University of Kerala and supported by fellowships from the Council for Scientific and Industrial Research and University Grants Commission.

Dr. T.T. Sreelekha : Gene mutation and tumor response to radiotherapy

Ms. Lakshmi Kesari : Programmed cell death in breast cancer.

- Mr. R. Radhakrishnan : Cellular and molecular profile of Non Hodgkin's lymphoma
- Mr. G. Srinivas : Programmed cell death, chemotherapy response and prognosis in pediatric acute lymphoblastic leukemia.
- Mr. Pradip Nair : Molecular manifestations of progression in the uterine cervix.

The division is also a resource and training centre for post graduate students of the Medical College hospital, Thiruvananthapuram. The following students completed and submitted their thesis to the University of Kerala and National Board of Examinations.

Dr. Jessey M.M., Dept. of Pathology, Medical College Hospital: p53 tumor suppressor protein and tumor, proliferation in gastric carcinoma.

Dr. V.G. Reghunathan, Dept. of General Surgery, Medical College Hospital: Gastric carcinoma : analysis of clinical and cellular variables.

Dr. G. Pushkas Dept. of E.N.T., Medical College Hospital: Clinical implications of tumor cell proliferation and associated gene expression in laryngeal lesions.

Dr. Bindu C.S. Dept. of Pathology, Medical College Hospital: Clinical pathological study of breast cancer.

M.D/M. STheses (currently being carried out)

Dr. Shobha Abraham, Dept. of Pathology, Medical College Hospital: Angiogenesis and Tumor Proliferation in meningioma.

Dr. Sreekala, Dept. of Obstetrics & Gynecology, SAT Hospital, Medical College: Clinical significance of human papillomavirus in premalignant and malignant lesions of the uterine cervix.

Dr. Preethi T.R., Dept. of Pathology, Medical College: The role of p53 gene expression in epithelial ovarian tumors.

Dr. V/Jayalakshmi, Dept. of Pathology, Medical College: Epidermal growth factor and angiogenesis in thyroid carcinoma.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

DIVISION OF CLINICAL LABORATORY SERVICES

Smt. Padmavathy Amma B. - Technical Officer

Clinical Laboratory Services has always been of immense help in diagnosis and also patient care. This division has earned approbation not only in the Regional Cancer Centre, but also from the Medical colleges, all Govt. hospitals, Private hospitals and Laboratories of the State. One of the salient features is that all the clinical investigations are done under one roof and the laboratory functions 24 hours a day through out the year. The output is nearly 360 patients per day (240 in hematology and 20 in biochemistry). Sample collection are done meticulously for both venipuncture and capillary blood. The used disposable consumables are deformed thermo-chemically at the laboratory itself.

The hematology section has to its credit most advanced equipment like fully automated analyzer *COULTER ONYX* delivering results of 18 parameters and *COULTER ACT*® and coagulation analyzer. The biochemistry laboratory has 3 analyzers (*E-MERCK*) a new dry chemistry analyzer (*JOHNSON&JOHNSON*), a blood gas analyzer (*CORNING*), flame photometer (*CORNING*) and electrophoresis package. The laboratory is up-linked to the computer server at the center's computer network enabling speedy access of the results and data to all nodes situated elsewhere at the centre. The stand alone computer at the laboratory compiles and manages the inventory and staff details by a custom software developed for the purpose.

The reports are sent to the respective wards through the counter and results demanding urgency are conveyed over the telephone to the physician concerned. The reporting of results is done according to priority decided by the state of the patient and modality of treatment. The average reporting time of results varies from 5 min. to 45 min. according to the number of investigations requested irrespective of workload.

The activities of the laboratory according to patient care priority are outlined below. Special stains and immunocytochemical analysis for leukocyte alkaline phosphatase and non-specific esterase determination are performed for leukemia detection along with peroxidase activity PAS specificity and blood picture with full differential count. Myeloma band detection by serum electrophoresis and presence of urinary Bence Johns protein are performed. Acid phosphatase both total and prostatic specific

detection will reveal a lot about the presence and progress of primary cancer. Liver metastasis is easily ascertained by estimation of liver function test and coagulation profile.

Other than diagnostic aid the laboratory has also a major role to play in the patient supportive investigations. The patient of this category falls in the group where results are sent in the minimum time. The hematological profile along with liver function and renal function tests are performed for each patient every day till the end of the chemotherapy regime. The detection of HbsAg and serum electrolytes estimation, reticulocyte count and Pearl's reaction in bone marrow is critical for patients belonging to this category.

The results of the laboratory are kept as the most reliable ones by participating in external quality evaluation program with Christian Medical College Vellore and stringent internal quality control program. The laboratory has set a range of acceptable reporting range of values and is calibrated. The values falling above or below the expected range are further analyzed for concurrent values before reporting. By all this effort it is assured that the results are in par with any of the leading reference laboratory both in India and abroad.

The laboratory also provides useful data and samples for various research projects, the details of which are listed elsewhere.

Name of the project	Investigating Officer/s
1. Atlas Trial	Dr. B Rajan
2. Droloxifen Trial	Dr. K Ratheesan & Dr. N Geetha
3. Gemcitabine Trial	Dr. V P Gangadharan & Dr. Ramdas
4. TLCD-99 Trial	Dr. Jayaprakash Madhavan, Dr. Cherfan Varghese
5. Idoxifene Trial	Dr. S Parameswaran & Dr. N Geetha
6. Vitamin A Trial	Dr. Ramdas

Training

The laboratory also provides training program for MSc Biochemistry students from both Rajiv Gandhi Centre for Biotechnology and Mahatma Gandhi University, for a period up to 3 months. Short term training

is also given for students from various universities undergoing MBA in Hospital administration. MCA students from Kerala University also undergo short term training in software development and use in a multi-disciplinary environment like the laboratory.

Individual Achievements

Mr. Rajesh K.R., laboratory technician in addition to discharging his normal duties is also engaged in taking theory classes in microbiology for training assistant trainees.

Mr. Harlharan S., laboratory technician has registered in Kerala University for doing part-time doctoral research. His research work is on the genetic and hematological response of patients with hematological malignancies, under the supervision of Dr. Ravindran Ankathil.

Investigations carried out during the year 1997-'98

Biochemical	No.	Haematological	No.	Urine analysis	No.
Sugar	29796	Hb	79920	Sugar	9280
Urea	28872	WBC	76360	Albumin	9280
Cr	26616	RBC	38120	Acetone	3830
Uric acid	6840	Platelet	73680	Bile pigment	3120
Ca	2886	DC	61610	Bile salt	1100
Fe	10212	E.S.R.	20110	Urobilin	1128
Spot	18564	P.C.V.	23260	Reaction	655
Ca	19112	B.T.	5912	Specific gravity	360
Ca	19216	CT	5912	Bence John's	54
				Proteins	
HBSAg	4846	PT	358	Microscopy	386
TP	3952	A PTT	38		
ALB	3952	TT	25		
Cholesterol	210	Immunohistochemistry			
HDL	116	Peroxidase	4870		
Triglyceride	116	PAS	490		
LDH	116	Esterase	120		
Amylase	68	LAP	312		
Magnesium	11	Bone Marrow	2138		
ACP	1320				
Prostatic ACP	716				
Electrophoresis	174				
Na+	4567				
K+	4567				
Calcium	3320				

DIVISION OF INFORMATION SYSTEMS

Dr. Cherian Varghese
Bindu S S
Manoj G

- Systems Manager (i/c)
- Systems Analyst
- Jr. Systems Analyst

Patient management modules

The following patient management modules are running at various sites with full support of the division.

1. New patient registration
2. Appointments and general patient information
3. Inpatient admission
4. Cytology and histopathology
5. Pharmacy - billing and stock

As a second phase development of Patient management modules, an inhouse software for clinical laboratory services was developed using Ingres RDBMS in UNIX Operating System. In this module Biochemistry and Haematology results are entered from the respective labs. A new terminal was provided in OPD and these reports are generated at the OPD counter. Provision for both internal and external quality control checks are incorporated. Periodic reports are also generated accordingly. This computerisation has enabled speedy access to the results and reduced the workload of staff in Clinical Laboratory. The delay caused for maintaining various registers and getting the reports to the patients is reduced. Patients can enquire the status of the laboratory results at the OP counter itself.

Another inhouse software is developed for Radiotherapy Treatment Management System in Clipper 5.0 under DOS Operating System and is implemented in Radiation Physics Division. Accurate values for Percentage Depth Dose, TDF, daily given dose, daily tumour dose, treatment time and Gap Correction for both SAD and SSD technique for all the radiotherapy machines installed in RCC are calculated. Periodic reports are generated.

Other supports

The Division provides technical support as well as maintenance of all the personal computers installed in various divisions. Presently a total of 25 stand alone PC's are installed at various sites.

Technical support for data processing and annual report preparation for Hospital Cancer Registry and Population Cancer Registry is provided. Support is provided for other ongoing projects such as Natural Background Radiation Registry programme (NBRF) in Karunagappally, Trivandrum Oral Cancer Screening Study (TOCS) in Mangalapuram and Leukaemia Research Project, Trivandrum. Necessary software are developed for data entry (with online data checking) and report generation for Trivandrum Oral Cancer Study, Mangalapuram and Leukaemia research project.

Training programmes

Division extends guidance for doing project work for students from various colleges in the state of Kerala.

Five students from College of Applied Sciences, Kottayam, have developed a software for Blood Bank Data Management in Ingres.

Three students from University Institute of Technology, Trivandrum have developed an inventory package in Foxpro.2.6 for Clinical Laboratory.

Four Students from Marthoma College of S&T, Ayur did their project work using Visual Basic for Radiation Physics Division.

Software purchased

Corel Perfect Suite ver.8 includes Corel WordPerfect 8, Quattro Pro 8, Corel Presentations, Corel Central, Corel Photo House, Netscape Navigator Ver.3.0.

Hardware purchased

An external CD Writer - HP CD Writer Plus 7100

DIVISION OF COMMUNITY ONCOLOGY

Dr. Babu Mathew	- Professor
Dr. Ramani.S.Wesley	- Assoc. Professor
Sri.C. Sreekumar	- Social Investigator

Highlights activities

1. Participation in the "Janakiya Assoothranam Programmes" of the state as per the directive from the State Planning Board. The division helped the Primary health centres in planning, organising and implementing this project, effectively in 9 places this year.
2. Human resource development: training of doctors, health workers, Members of voluntary organisations and general public for cancer control activities.
3. Generation and distribution of health education materials and utilization of mass media for cancer awareness.
4. Anti-tobacco workshops and campaigns throughout the State with the support of voluntary agencies.
5. Establishment of village level comprehensive cancer control programmes and early cancer detection camps in the villages.
6. Community based cancer research in the form of chemoprevention studies in prevention of oral cancer by visual screening, cervicography for downstaging of uterine cervical cancer and the utilization of trained house surgeons for cancer survey and surveillance.
7. Management of early cancer detection clinic in the centres and maintenance of a pre cancer registry.

Early cancer detection clinic

An early cancer detection clinic of RCC is functioning in the department to examine patients with warning signals of Cancer, even off O.P hours and by prior appointments.

We have a supplementary registration system in this clinic and have registered 1915 patients. There were 27 cancers, 83 oral precancers, breast lesions and 114 cervical dysplasias. Down staging of cancers seen in this clinics.

Low cost Cervical Cancer detection programmes are done on Tuesdays and Thursdays. A total of 1153 persons were screened during the current year and we have detected 4 cancers, 4 carcinoma insitu and 111 dysplasias (precancers)

Management of premalignancies

We have started managing precancers of cervix and oral cavity by diathermic excisions and minor surgeries. 912 colposcopies, 155 cervicography-directed biopsies and 19 loop diathermic excisions were done for cervix. We have a precancer registry where all leukoplakias and premalignant oral lesions are registered and treated. Oral biopsies and excisions were done for all relevant precancers. Strict follow up of the above persons done was promptly.

Peripheral Centres

Early Cancer Detection Centre at Kollam

ECDC at Kollam started functioning during the current year. This centre works under the auspices of Kollam Cancer Care Society. The technical support for training, early detection and palliative care is given by this centre.

We have given one month training to Medical Officer of this centre. Besides, we have trained Medical Practitioners, Gynaecologists, ENT Surgeons, Dentists, Surgeons and Doctors of Homeo and Ayurveda etc, at Kollam to support ECDC Kollam. They were given practical training at ECDC. Health workers, Anganwadi workers Panchayath people and voluntary agencies were also given training in primary and secondary prevention. This division has participated in majority of the camps organised by ECDC Kollam.

Project office for community based cancer research activities

This office which was opened at Mangalapuram with 36 enumerators and 10 other staff is functioning well. Regular clinics are held here on Saturdays for detecting oral precancerous lesions. Special clinics on Sundays and field visits by doctors are conducted to increase the compliance of patients.

Public education

1. Two workshops were conducted for 168 key trainers of Health education from different schools.
2. Scout masters, Guide captains and school teachers (360 people) were given awareness about hazards of tobacco to start antitobacco cells in schools.
3. Forty six cancer awareness programmes were given to members of voluntary organisations, factory workers, community others as shows in table I.

4. Trained a group of voluntary workers of HOPE Foundation are involved in group activities like Early detection of Cancer. The idea is to set out a new plan for Cancer detection prevention by regular house visiting in this district. They bring about 89 cases for confirmation of diagnosis.

Generation and distribution of health education materials

Ten sets of audiovisual slides containing 36 colour slides and blue toned slides with cassettes were given to key health education materials generated during previous years were distributed among community volunteers and other target groups. programmes through AIR were broadcasted and one talk show ASIANET and one programme through Dooradarshan were telecasted during the period under report.

Professional education and colposcopy training

We are also involved in teaching and training programmes of Medical and Paramedical students of Medical College and Private hospitals. Short term training is also imparted to Specialist doctors, House surgeons, General practitioners, MSW students, Nurses etc. Colposcopy training was given to 19 Gynaecologists, Cytotechnicians and Cytotechnologists. They were given practical training in Low cost cervical cancer detection strategies. Inservice training was given to 35 health supervisors and doctors of other systems of medicine.

Visit by foreigners, policy makers etc.

A few visits were made by WHO authorities to this centre for inspection and also medical authorities, planners and policy makers from other states to study the pattern of cancer control activities of RCC being declared as a WHO collaborating centre. We have helped two States in organising community oncology activities this year. The work done by this department was much appreciated by them.

Project Consultancy

Assistance in the design, implementation and analysis has been provided to researchers, postgraduate students (for dissertation and Thesis) MSc nursing and MSW students and college/school students to prepare their project work. In addition we have participated in the academic activities of the centre and contributed to the research activities of other divisions.

Welfare activities for the poor

With the help of Social investigators and doctors of this division we have provided counselling, financial help, and arranged accommodation facilities to poor patients and acted as liaison between rural camp patients and the hospital.

Provision of information to many patients, bystanders, voluntary workers through person to person communication, leaflets, pamphlets, posters and exhibits were given routinely. Psycho-social support is given by this division for removal of cancer stigma and for motivation of patients to undergo treatment.

Articles in Lay Press

Following articles were published in print media by Dr. Babu Mathew.

- 1. On Panmasala habit - Mathrubhoomi (August 1997)
- 2. A short cut to suicide regarding hazards of Panmasala - India Today (June 1997)
- 3. Dietary lifestyle and cancer - Vanitha 1998

Mr. Greekumar has written "Cansarinethire Kurishuyuddam" in Malayalam Daily (December, 14, 1997.)

Cancer camps

Twenty eight cancer detection camps were conducted during the period under report, the details of which are shown in table 2.

Village level Comprehensive Cancer Control programmes (VCCCP)

Ten new villages were included in VCCCP during this period. Trained unemployed educated youths surveyed their community and detected many cancers and precancers as shown in table 2.

Antitobacco programmes and Campaigns

In addition to the tobacco cum cancer awareness mentioned in table 1, a week long awareness programmes for target groups like school teachers, working journalists, supervisory staff of social welfare and Education Dept, Factory workers etc. were held from 26th May to 31st May on the current years theme of "World No Tobacco Day" on 31st May. The day was observed with a workshop, a public meeting and a rally. Voluntary organisations like Regional Cancer Association, Alcohol and Drug information centre, International Union for Health Education and

Bharath Scouts and Guides collaborated with RCC to observe "World tobacco day" and in organising antitobacco programmes. In Trichur district Junior chambers and scouts have organised seminars and started antitobacco cells.

Research projects

1. Evaluation of unaided visual inspection, cervicospopy and pap smear in Screening for cervical cancer

(Funded by: IARC)

Principal Investigator Dr. N. Sreedevi Amma
 Co - Investigators Dr. Hemani Wesley,
 Dr. Thara Somanathan,
 Dr. Namratha, Dr. Syamala Kumari,
 IARC Investigators Dr. Sankaranarayanan, Dr. D.M Parkin

The study is to evaluate whether visual inspection of cervix using 3% acetic acid (cervicospopy) permits improved detection of invasive and pre invasive lesions compared to unaided visual inspection and to determine whether cervicospopy can improve the sensitivity of pap smear. All the 3000 women targeted were completed in this academic year. The second phase of this study has been started in this year including schiffers test, cervicospopy, colposcopy and biopsy for all relevant cases to evaluate low cost technologies. The study will be over by 1999.

2. Evaluation of Oral Visual Inspection in the control of Oral Cancer

(Funded by: IARC)

Principle Investigator Dr. Babu Mathew
 Co - Investigators Dr. M. Krishnan Nair, Dr. Manoj Pande,
 Dr. Elizabeth Ninan, Dr. Gigi Thomas,
 Dr. Thara Somanatan,
 Dr. Iqbal Ahemmed,
 Ms. Binu, Dr. Ramadas
 IARC Investigators Dr. R. Sankaranarayanan,
 Dr. P. PIsani and
 Dr. D.M. Parkin

The aim of this community based randomized intervention trial is to evaluate the effectiveness of mouth self examination by trained workers in preventing mouth cancers, detecting invasive Oral Cancer at an early stage and preventing deaths from oral cancer. Approximately 90,000 subjects aged 40 - 64 yrs. living in two community development blocks in Trivandrum district, are recruited and randomised to screening and control arms. The subjects are advised to give up tobacco habits. Precancers and cancers will be treated. The study group are followed up for oral cancer incidence and mortality. The first phase of the study is over during this academic year.

Evaluation of Chemoprevention of Oral Cancer with long term administration of Vit. A. in subjects at high risk.

(Funded by: IARC)

Principal investigator Dr. Babu Mathew
 Co - Investigator Dr. M Krishnan Nair,
 Dr. Sreedevi Amma N,
 Dr. Ramadas, Dr. Sudhakaran
 P.R., Dr. P.P Nair
 IARC Investigators Dr. R. Sankaranarayanan and
 Dr. D.M. Parkin.

Role of Omega 3 Fatty acids on population of Kerala.

Principal Investigator Dr. Babu Mathew
 Co-investigator Dr. P.R. Sudhakaran, Dr. P.P. Nair,
 Dr. R. Sankaranarayanan
 Collaborators Department of Biochemistry, University
 of Kerala John Hopkin's University,
 Baltimore, U.S.A.

Study of Tobacco Related mortality In Trivandrum District

Funded by: IARC)

Chief Investigator Dr. Babu Mathew
 Co-Investigator Dr. M. Krishnan Nair
 External Investigators Dr. Richard Reto,
 Dr. R. Sankaranarayanan

TABLE 1
Details of cancer awareness programmes 1997-'98

SL.NO	DATE	PLACE	ORGANISED BY	NO.A TTEN- DED	TYPE OF PARTICIPANTS
1	8/4/97	Chitranagar	Chitranagar Residents Association	65	Lay Public
2	9/4/97	Trivandrum	Sevika Sangam	81	Religious People
3	11/4/97	Kollam	DCCP	72	Panchayat Presidents
4	18/4/97	Chenganoor	St.Marys Orthodox church	250	Religious organisation members
5	22/4/97	RCC	RCA & ICDS	81	Teachers
6	27/4/97	Kollam	DCCP	84	Community Volunteers
7	18/5/97	Kollam	DCCP	79	Doctors of other systems of medicine
8	26/5/97	Trivandrum	RCA	269	School Teachers
9	27/5/97	Trivandrum Hotel	RCA	28	Members of Kerala WATCH
10	28/5/97	RCC	RCA	68	Journalists
11	29/5/97	RCC	RCA	96	Health educators and Policy makers
12	30/5/97	Peroorkada	Hidustan Latex & RCA	306	Factory workers
13	30/5/97	Trivandrum	RCC & RCA	42	Members of Youth Congress
14	31/5/97	Trivandrum	RCA and Scout & Guides	160	Scouts & Guides
15	31/5/97	Trivandrum	RCA and Scout & Guides	200	Lay Public
16	7/6/97	Trivandrum	Scouts & Guides	80	Scouts & Guides
17	7/6/97	Trivandrum	Scouts & Guides and members of Junior chambers	126	Members of junior chambers
18	12/6/97	RCC	Loyola College	48	MSW Students
19	27/6/97	Nilamel	S.B.T.Nilamel	294	Community Volunteers
20	30/7/97	Anchal	YWCA	85	Elete group
21	13/8/97	Palode	Sowbrida Gramam	384	Tribal Volunteers
22	15/8/97	Valiyathura	CSI Church	216	Lay Public
23	20/8/97	Poovar	G.V.H.S.S Poovar	141	Students & Teachers
24	29/8/97	Pathanamthitta	Mahila samajam & YWCA	112	Religious women
25	30/8/97	Puliyoor	RCA & SBT	420	Lay Public
26	3/9/97	Thrikadavoor	DCCP Kollam	62	Health workers
27	6/9/97	Poojapura	State Council of Education	32	Teachers
28	20/9/97	Kottakkakam	RCA	180	Bank Employees
29	18/10/97	RCC	RCC	52	Nurses
30	22/10/97	RCC	Nursing College, TVM	4	M.Sc Nursing Students
31	22/10/97	Thumba	ISRO	520	Staffs, ISRO
32	23/10/97	RCC	Loyola College	8	MSW Students
33	26/10/97	Ayoor	Sevika Sangam	350	Religious People
34	11/11/97	Paravoor	Municipal Council Peravoor	132	Panchayat Presidents & Members
35	12/11/97	RCC	RCC	39	Nurses
36	14/11/97	RCC	Medical College Trivandrum	38	House Surgeons
37	16/11/97	Thiruvalla	Education Department	130	Science Teachers & Keytrainers

38	19/11/97	Nettayam	SreeRamakrishna Mission	32	Lay Public
39	6/12/97	Chenganoor	Sevikasangam	423	Lay Public
40	11/12/97	Trivandrum	Hindi Pracharasabha	234	Students
41	12/12/97	Kottarakkara	Sevikasangam	362	Lay Public
42	2/2/98	RCC	RCA & Rotary Club	49	Rotarians
43	8/2/98	PrasanthNagar	SreeNarayanaSamskarika Samithi	22	Members of SreeNarayana Samskarika Samithi
44	14/2/98	Mariyapuram	Christian Youth Movement	123	Youths
45	18/2/98	Thycaud	DME	35	Health Supervisors
46	21/2/98	Sastamangaiam	SBT	158	Bank Employees &LayPublic

TABLE 2
Details of cancer detection camps 1997-98

Sl.No	Date	Place	Organised by	Total Screened	New Cancers	Old Cancers in recurrence	Oral Pre-cancers	Other pre-cancers
1	15-4-97	Kamukinkode	C.S.I.Church	32	1	1	3	1
2	18-4-97	Chenganoor	St.Marys Orthodox Church	78	2	1	6	9
3	20-4-97	Ponnumangalam	St.Joseph's Church	79	0	0	1	2
4	26-4-97	Kuttichal	Residents Association	212	0	0	0	0
5	20-5-97	Ponnumangalam	Yajanasala	171	0	2	2	2
6	25-5-97	Vattappara	NSS Medical College	104	1	0	1	2
7	23-6-97	Karipoor	Loyola College(VCCCP)	171	2	0	12	2
8	12-7-97	Cheilamangalam	Residence Association	30	0	0	1	0
9	19-9-97	Trikkadavoor	DCCP, Kollam	76	0	0	15	5
10	19-9-97	Kattakkada	Swedeshi Arts Club	63	0	0	7	2
11	24-10-97	Anchal	DCCP, Kollam(VCCCP)	1423	12	2	42	16
12	25-10-97	Thrikovilvattom	DCCP, Kollam	950	7	2	35	18
13	31-10-97	Kallada	DCCP, Kollam	932	6	1	58	15
14	21-11-98	Punaiur	DCCP, Kollam	962	7	4	29	18
15	24-11-97	Nettayam	Rural Health Centre	52	4	0	7	6
16	28-11-97	Karavalloor	DCCP, Kollam	423	4	1	57	20
17	29-11-97	Aryankavu	DCCP, Kollam	232	3	0	20	9
18	30-11-97	Law College	Poura Samithi	14	0	0	0	0

			&RotaryClub					
19	3-12-97	Edavacode	ICDS	72	0	0	7	2
20	14-12-97	Valiathura	Christian Movement	24	1	0	0	0
21	21-12-97	Kaniyapuram	Muslim Association	14	0	0	0	0
22	10-1-98	Poovachal	SRK Mission	165	1	0	8	0
23	18-1-98	Kurumathoor	Malabar Cancer CereSociety	410	4	1	34	18
24	24-1-98	Pattazhi	DCCP,Kollam	235	3	0	10	4
25	20-2-98	Mayyanad	DCCP,Kollam	350	2	0	14	10
26	27-2-98	Kiliyalloor	ECDC,Kollam	465	2	0	26	12
27	1-3-98	Karunagappally	NBRR	98	1	0	4	2
28	15-3-98	Pathanamthitta	Mezhuveli Rotary Club	225	4	2	65	6
29	20-3-98	Ponnara	Sreevaraham ResidentsAssociation	276	4	0	10	5
30	28-3-98	Thrikkadavur	DCCP, Kollam	577	6	1	47	10
31	30-3-98	Puliyarakonam	Sathyasaibabha Association	312	0	0	3	7
TOTAL				9227	77	18	524	205

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)



Staff, Early Cancer Detection Centre and District Cancer Control Programme, Ernakulam

DIVISION OF E.C.D.C, ERNAKULAM

The overall activities of the Early Cancer Detection Centre (ECDC) during the year were as follows:

1. Cancer screening clinic every day at ECDC, Ernakulam
2. Cancer screening camps in rural and urban areas with assistance from non- governmental & governmental organizations.
3. Cancer awareness programmes
4. Conduct the activities of the Ernakulam District Cancer Control Programme
5. Monthly follow-up clinics of old RCC treated patients in ECDC, Ernakulam
6. Monthly pain clinics
7. Provide cytology and histopathology diagnostic facilities for material sent by Medical Centres.

ECDC Ernakulam

On an average 30 to 35 people attend the ECDC, Ernakulam every day for cancer screening. They attend as referred from other centres or are self volunteered for screening. A total of 12,901 persons were screened during the year ECDC & DCCP together.

Average No. of patients attending monthly follow-up clinics - 130

Number of patients seen in pain clinics - 168 Screening outcome in detail are given in Tables 1 to 5

TABLE 1
The screening activities in detail during 1997-'98

Particulars of work done	ECDC	DCCP	Total
Persons screened	6968	5933	12901
Cervical smears	3789	3823	7612
Oral smears	204	579	783
Fine Needle Aspiration	1769	799	2568
Sputum	135	...	135
Other body fluids	32	...	32
Histopathology	83	...	83
Colposcopy	102	...	102
Colpodirected Biopsy	28	...	26

TABLE 2
Screening in ECDC

No. of persons screened	- 6968
Cancer cases	- 427
Cytological examination	- 5991
Gynaec cytology	- 3789
Cancer cases	- 52
Non-gynaec cytology	- 2202
Cancer cases	- 375

TABLE 3
Results of Pap screening of gynecological smears in ECDC

Total Gynaecological smears	- 3789
Invasive Sq. Ca.	- 49
Adenocarcinoma	- 3
Carcinoma-in-situ	- 6
Dysplasias	- 279
Inflammation	- 2133
All other conditions	- 1075
Normal smear	- 244

TABLE 4
Results of non gynaecological smear examinations in ECDC

Lesion	Total
I Oral	
Benign	49
Pre-malignant	50
Suspicious	9
Malignancy	94
Radiation changes	1
Miscellaneous	1
Total	204
II Breast	
Benign	620
Suspicious	5
Malignancy	94
Miscellaneous	4
Total	723

III Thyroid

Benign	393
Suspicious	15
Malignancy	13
Miscellaneous	1
Total	422

IV Lymphnode

Benign	263
Suspicious	-
Malignancy	
a. Primary	6
b. Secondary	65
Miscellaneous	6
Total	340

V Salivary Gland

Benign	30
Suspicious	4
Malignancy	8
Total	42

VI Liver

Benign	7
Malignancy	17
Miscellaneous	4
Total	28

VII Lungs

Benign	4
Malignancy	15
Miscellaneous	2
Total	21

VIII Other Sites

Benign	183
Malignancy	29
Miscellaneous	1
Total	193

IX Body fluids

Ascitic fluid	
Benign	4
Malignancy	3
Total	7
Pleural fluid	
Benign	19
Malignancy	5
Total	24
Hydrocele fluid	
Benign	1
X Urine	
Malignancy	1
X Nipple Discharge	
Benign	60
Malignancy	1
Total	61
Total	2067

**TABLE 5
Sputum Cytology**

Lesion	Total
Benign	106
Suspicious	2
Malignancy	24
Miscellaneous	3
Total	135

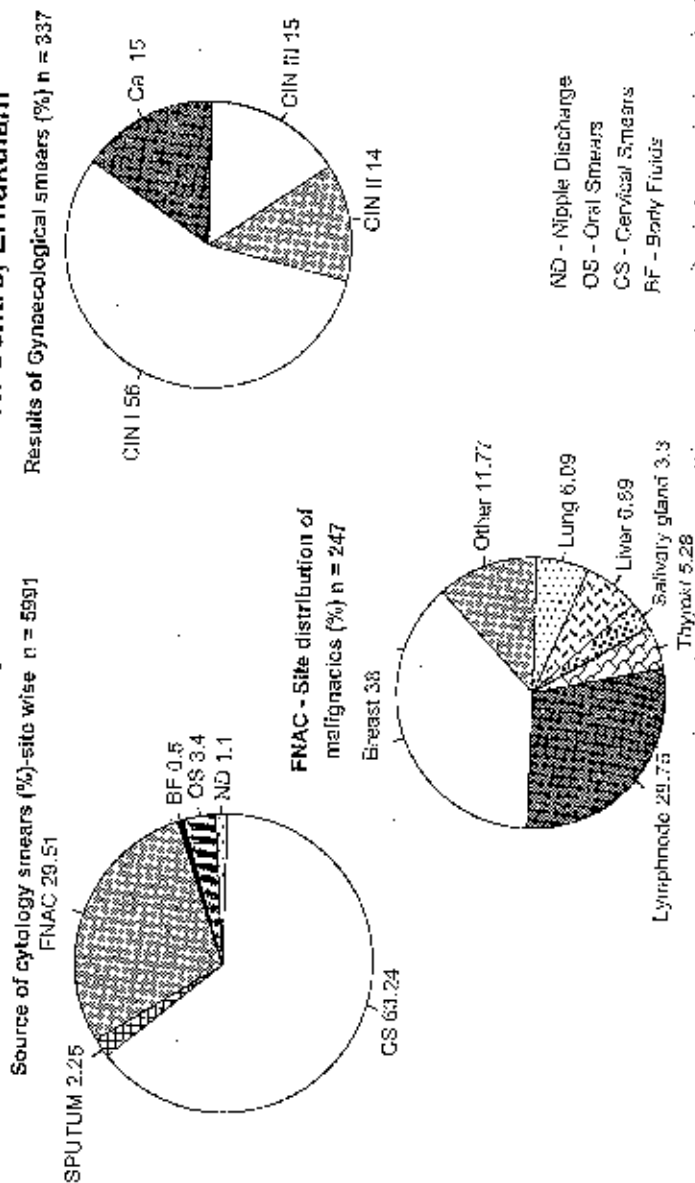
**TABLE 6
Histopathologic Examination**

Specimen	Benign	Ca-In-situ	Malignant	Total
Gynaecological	26	7	4	37
Breast	6	2	4	12
Oral	5	-	3	8
Other sites	19	-	5	24
Miscellaneous	-	-	-	-
Total	56	9	9	163

Work done in DCCP - April 1997 - March 1998 (Rural screening)

Total	number of persons screened	5,933
	Female	5,034
	Male	899
	Cancer cases	59
	Gynaec cytology	3823
	Cancer cases	12
	Non gynaec cytology	370
	Cancer cases	47
Oral	Non-malignancy	439
	Pre-malignant lesions (Clinical/Cytological)	262
	Malignancy	17
	Suspicious of malignancy	0
	Miscellaneous	52
	Total oral smears	572
Breast	Non-malignancy	126
	Malignancy	12
	Suspicious of malignancy	1
	Miscellaneous	64
	Total breast aspiration	203
Cervix	Non-malignancy	3,591
	Pre-malignant lesions	220
	Malignancy	12
	Total cervical smears	3,823
Thyroid	Benign	187
	Malignancy	3
	Suspicious	1
	Atypia	3
	Miscellaneous	27
	Total thyroid aspiration	221
L.N	Benign	21
	Granulomatous	30
	Suspicious	0
	Miscellaneous	11
	Malignancy	7
	Total L.N aspirations	69
Other Sites	NMC	123
	Suspicious	1
	Malignancy	8
	Miscellaneous	174
	Total	306

Screening activities in Early Cancer Detection Centre, Ernakulam



Ernakulam District Cancer Control Programme (DCCP) - 1993-'98.

The district cancer control programme Ernakulam was started in 1993 and by 1998 it had completed 5 years. The District Medical Officer, Ernakulam, Dr. K. Sivadasan was instrumental in planning the day to day schedule of screening camps through the PHC's, the time table for training of health workers of the district in government sector, and issued orders for participation in the programme by the governmental health care system in the district. The Regional Cancer Centre had designed the technical details of the programme. For programme implementation, the district was divided under 4 nodal centres situated in the 4 taluk hospitals, at Parun, Perumbavoor, Moovattupuzha and Mattancheri in Kochin taluk. The necessary updates for doctors were conducted by ECDC as also the training for health workers. Every week one screening camp was conducted under each nodal centre, thus 4 screening camps were held in each week and these camps were held in different locations. The doctors who had received their training conducted these screening camps, with the ECDC providing the support group personnel (nurse, technician, clerk, helper etc. Cytology examination of the material collected in the camps were transferred to the Early Cancer Detection Centre at Katoor, Ernakulam. Thus a centralised collection and evaluation of specimens was adhered to. The results indicate that the programme can become a sustainable one. The Early Cancer Detection Centre, Ernakulam mainly caters to the population of Ernakulam district, but a little percent in the city and hence is a highly symptomatic group. The number of cancer cases thus is large in this screened group.

Cancer Pain Clinics were regularly conducted under the district cancer control programme since July 1995. A total of 68 pain clinics were conducted 34 being in the district hospital cancer ward. In both these together 312 patients received medicines. Morphine was supplied to the needy patients. Following are the resume of results.

TABLE 1
 DCCP & ECDC Screening - 1993-98

	DCCP	ECDC	Total
No. of persons	31816	34906	66722
Male	5667	2866	8533

Female	28149	32040
No. of clinics	674	1460
No. of cancer cases	222	2039
Premalignant cases	2169	1749
Suspicious of malignancy	17	158

TABLE 2

Site and number of cancer cases detected* in ECDC

Oral	- 527
Breast	- 498
Cervix	- 291
Thyroid	- 51
LN +ve	- 310
Lungs	- 36
Liver	- 38
Body fluid & sputum	- 126
Other sites	- 162
Total	- 2039

* Attendees - Doctor referred and self volunteered

TABLE 3

Site & type of cancers detected in DCCP camps*

Oral	71
Breast	31
Cervix	73
Thyroid	6
LN +ve	20
Other sites	21
Total	222

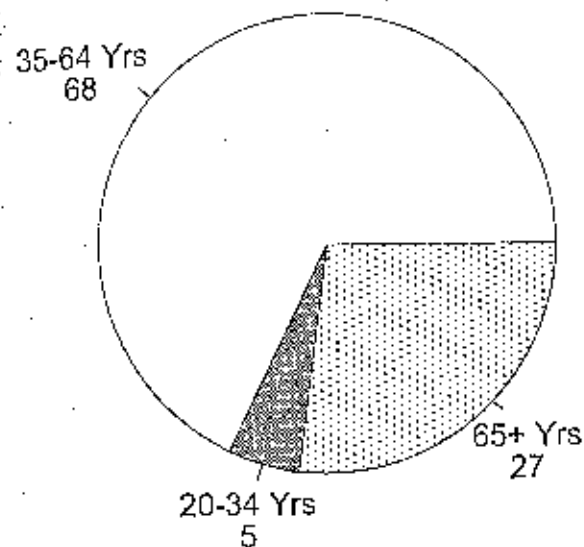
* Attendees - Motivated by propaganda

TABLE 4

Tobacco alcohol habitues among attendees

	Male	Female
Tobacco chewers	32%	17%
Tobacco smokers	61%	0.5%
Alcohol users	37%	0.1%
No habit	27%	83%

Age distribution of attendees



DIVISION OF E.C.D.C, PALAKKAD

Dr. R. Aranda Kamath - Cytopathologist

Activities

The centre continued all the activities undertaken during the previous year. These comprised of examination of patients at the centre, referral from the other institutions, participation in Cancer Detection Camps organised by voluntary agencies, collection of smears from these patients either directly or by FNAC, processing and reporting these, referring diagnosed cancer cases to RCC or elsewhere for proper treatment and providing pain and palliative care to incurable and advanced cases as per WHO guidelines. The output of work has been analysed and presented along with.

During the year 4 screening camps were conducted in rural areas where 1050 patients were screened. 63 new patients were seen in the pain clinics and there were 262 patients visited to the pain clinic during the reporting year.

TABLE -1

Break up of cytological smears for the year 1997-98

Specimen	Centre	Camp	Total
Cervical smears	254	134	388
Buccal smears	86	2	88
Breast	46	0	46
Lymphnode	21	1	22
Nipple discharge	6	1	7
Fluid	3	--	3
Thyroid	8	--	8
Sputum	151	--	151
Others	23	1	24
Total	598	139	137

TABLE -2
Analysis of Gynaecological smears

Cervical smears	Centre	Camp	Total
Normal	29	39	68
Inflammation	124	68	192
Inflammation with squamous metaplasia	5	1	6
Inflammation with glandular cell proliferation	6	2	8
Endocervicitis	25	9	34
Trichomonas			
Vaginalis infection	8	10	18
Viral infection	1	--	1
Autolytic atrophy	2	1	3
Mild dysplasia	9	1	10
Moderate dysplasia	3	--	3
Severe dysplasia	2	--	2
Cx-in-situ	1	--	1
Suspicious	9	2	11
Squamous cell carcinoma	21	--	21
Radiation changes	3	--	3
Others	6	1	7
Total	254	134	388

TABLE -3

Analysis of Non-Gynaecological smears

Specimen	Centre	Camp	Total
Buccal smears			
Non-malignant	56	1	57
Pre-malignant	13	--	13
Suspicious	4	--	4
Malignant	13	1	14
Total	86	2	88
Breast			
Non-malignant	37	--	37
Suspicious	1	--	1
Malignant	8	--	8
Total	46	--	46

Lymphnode				
	Non-malignant	16	1	17
	Suspicious	2	--	2
	Malignant	3	--	3
	Total	21	1	22
Fluid				
	Non-malignant	2	--	2
	Malignant	1	--	1
	Total	3	--	3
Nipple discharge				
	Non-malignant	5	1	6
	Malignant	1	--	1
	Total	6	1	7
Thyroid				
	Non-malignant	7	--	7
	Malignant	1	--	1
	Total	8	--	8
Sputum				
	Non-malignant	144	--	144
	Suspicious	3	--	3
	Malignant	4	--	4
	Total	251	--	251
Miscellaneous				
	Non-malignant	11	1	12
	Suspicious	1	--	1
	Malignant	9	--	9
	Total	21	1	22

TABLE - 4
Cancer Detection Camps during the year 1997-98

Date	Place	Organisation	No. of patients Screened	No. of smears collected
06.04.97	N.S.S. School Pallatheri, Marutharoad, Palakkad.	Sathya Sai Seva Sangham, Chandranagar.	100	19
20.04.97	Govt. H.School, Meppayoor, Kozhikode Dt.	Malabar Cancer Care Foundation	300	57

12.97	Muttikulangara Palakkad Dt.	Ayyappa Seva Sangam Muttikulangara	150	--
01.98	Kurumathode Govt. H.S., Kannur Dt.	Malabar Cancer Care Society Grama Panchayath Kurumathode.	500	63

TABLE -5
Pain and palliative care clinic, 1996-97.

		Numbers
New cases		63
WHO	Step I	3
	Step II	19
	Step III	41
Total Number of visits		262

Research programme

Smt. Lakshmi S., Cytotechnologist had submitted a thesis on "Pathological factors in Cervical Oncogenesis" to the University of Kerala for the award of Ph.D.

DIVISION OF LIBRARY AND INFORMATION SERVICES

Sri. M.Chandrakumaran Nair - Senior Librarian

Being the information provider, this division proved its active participation in all the programmes of the centre during the period under report. The acute dearth of space was solved by shifting the library to the new premises last year end. Since then, considerable increase in the use of library resources has been noticed. Library remained open on all the days from 9 am to 5 pm except on sundays and nine national holidays. In order to manage the new set up in the new building, two library assistants were appointed which strengthened further the library services.

Upgradation of infrastructural facilities

A computer of latest configuration - pentium 166MMX, 32 MB EDORAM, 2.1 GB HDD, 256 KB cache, SVGA colour monitor along with 20X CD drive and an Inkjet printer from HCL has been procured. In view of the increasing demand for projection facilities, a portable OHP has also been acquired during the period.

Library Collection

Despite budgetary constraints, high priority has been accorded to continue subscription to journals with the available funds, library received 105 journals of which 70 are foreign journals. On the basis of the review by the library committee and considering the demand for new journals, 10 journals were discontinued and 7 new journals were added. Subscription to 'Cancer research' for 1997 was sponsored by Nicholas Piramal India Ltd. About 400 numbers of reprints of journals which are not subscribed to the library were collected mostly from the authors concerned. The collection development during the year under report are detailed below

	Added during 1997-1998	Collection as on March 1998
Books, monographs and back volumes	529	5805
Current journals	1	105
Reprints and reports	425	2656
Audio-Video cassettes	6	86

Internet search facility and Electronic Mail

The noteworthy feature of this year was the heavy use of internet search and E-mail facility provided in the library. The library is taking care of the entire E-mail requirements of the centre. As one's direct connection to the world of network and the most economical means of communication, E-mail is being well utilised by all of our departments for their official and research project requirements. This facility is also being frequently used for database searches.

ONLINE access to MEDLARS databases provided in NICNET connectivity and also on internet was utilised by both internal users and external users.

ONCODISC, CURRENT CONTENTS & POPLINE

Library subscribed to ONCODISC, a monthly updated cancer information source on CD ROM this year as it contained revised edition of some full text documents. In view of the increased research activities, the weekly updated life sciences version of current contents on Diskette with abstracts was subscribed. Centre for Communication programmes of John Hopkins School of Public Health has agreed to provide POPLINE on CD ROM to support Centre's clinical and epidemiological studies free of cost. We received the database this year which contains citations and abstracts of the world wide literature on population, demography, environment, background radiation, health care communication, human fertility etc.

RCC Publications

Forty seven research papers contributed by the academic staff were added to the inhouse database of RCC publications along with its abstracts. Data relating to the various conferences symposia and seminars attended to by the staff members are also being added to the database concerned.

Other Information services

The distribution of fortnightly RCCL Current Contents carrying the contents pages of journals and other documents added to the library resources and the RCCL press clippings, the quarterly clippings bulletin containing the press information on oncology and allied areas were continued. Database search facilities provided by BARC and NIC, New Delhi, are being effectively utilised using E-mail.

As regards the reprographic services, the entire professional, office and project photocopying requirements of all divisions were met by the library.

External users, institutional membership and Interlibrary loan

The library resources are increasingly used by several doctors, researchers, students from Medical Colleges, University Departments, Research Institutes and other research organizations. The interlibrary borrowing arrangements with institutions like British Library, Centre for Development Studies and SCTIMST were continued.

Teaching and training

Teaching and Training activities include the one year apprenticeship training to two library and information science graduates approved by the Govt. of India and the five lectures provided to the M.Phil students of clinical epidemiology Medical College.

Modernisation of Library and Information Services

Steps have been initiated to procure an integrated software to computerise the entire house keeping operations also.

Conferences, etc. attended - (Chapter III)

Papers Presented - (Chapter IV)

Papers Published - (Chapter V)

CONFERENCES/SEMINARS/TRAININGS/ WORKSHOPS, ETC. ATTENDED - BY VARIOUS STAFF.

Dr. Aleyamma Mathew
Asst. Prof. In Statistics &
Epidemiology

Faculty Member, Workshop on Research methods in oncological studies with computer applications. NewDelhi, July, 1997.

"

17th Annual convention of Indian association for cancer research, Calcutta, January, 1998.

"

Invited speaker, Role of statistics in medical field, Dept. of Statistics, University of Kerala, Trivandrum, February, 1998.

Ms. Aleyamm Mathew
Staff Nurse

The foundation course in palliative care, Calicut, November, 1997.

Dr. Anitha Mathews
Lecturer in Pathology

IAPM, Meeting, Kerala chapter, Alleppey, May, 1997.

"

Faculty member, CME on breast neoplasia, Trivandrum, July, 1997.

"

CME on Paediatric Oncology, Trivandrum, January, 1998.

Mr. Arun Kumar L.S
Asst. Prof. in Radiation
Physics

Review meeting for research projects of STEC, Trivandrum, August, 1997.

"

Iridium 192 Brachytherapy training, Hyderabad, 30th July and 14th August, 1997.

"

Symposium on Physical & Clinical Aspects of Electron Beam Radiotherapy, New Delhi, September, 1997.

"

Workshop on quality assurance in Radiotherapy & Radiodiagnosis, KAMP, Trivandrum, November, 1997.

	"	8 th Annual meeting of Kerala Association of Medical Physics (KAMP), Trivandrum, November, 1997.		"	Clinical Research Methodology Workshop (Ely Lilly), New Delhi, March, 1998.
Dr. Babu Mathew Prof. in Community Oncology	"	World Tobacco Control conference Beijing (China), August, 1997		"	Workshop on Managing Operations Research, Kathmandu, Nepal, March, 1998.
	"	National workshop on Forensic odontology, Dental council of India, Bangalore, 1997.	Dr. Davis CA Asst. Prof. in Radiation Physics	"	Workshop on quality assurance in RT & Association of medical physicist, RD, Kerala, Trivandrum, November, 1997
	"	ICMR Brain storming session on panmasala, New Delhi, February, 1997		"	Annual meeting of AROI Kerala chapter, December, 1997.
	"	State level workshop on oral cancer control, Simla, March, 1998.	Dr. T.S. Elias Asst. prof in Radiation Physics	"	World congress on Medical Physics and Biomedical engineering - Nice, September, 1997.
Dr. Beela Sarah Mathew Lecturer in Radiotherapy	"	Advanced course on radiotherapy 2000 clinical and preclinical strategies, Switzerland, December, 1997.		"	18th AMPI Annual Conference on Medical Physics, Punjab, November, 1997.
Dr. Bhattathiri V N Asso. Prof. in Radiotherapy	"	Invited speaker on Radiation Biology at Department of Zoology, University of Kerala, March, 1997.		"	HDR training, Royal marsden hospital, London, September, 1997.
	"	International congress of radiation oncology, Beijing, China, June, 1997	Dr. Elizabeth K. Abraham Asst. Prof. in Cytopathology	"	Faculty member, CME on breast neoplasms, RCC Trivandrum, July, 1997.
	"	Research co-ordination meeting of the IAEA, Manchester, UK, March, 1998.		"	Faculty member, Association of otolaryngologists of India, Trivandrum chapter meeting, December, 1997.
Dr. Chandralekha B Prof. of Cytopathology	"	Faculty member, CME on recent trends in medical laboratory technology, Trivandrum, August, 1997.		"	Workshop on electron microscopy, Trivandrum, December, 1997.
	"	Faculty member, Annual national conference of IAC New Delhi, November, 1997		"	CME on Paediatric Oncology, Trivandrum, January, 1998.
Dr. Cherian M Koshy Asst. Prof. of Surgical oncology	"	2nd International hospice conference, Mumbai, February, 1998	Dr. Gangadharan VP Asso. Prof. in Medical Oncology	"	Urologists association, Cochin, October, 1997.
	"	5th International conference of IAPC, Mumbai, February, 1998.		"	International Symposium on Orthopaedic Oncology, Chennai, October, 1997.
Dr. Cherian Varghese Asso. Prof. in Epidemiology	"	Visited the Haematology Malignancy Diagnostic Unit, University of Leeds and the Institute of Cancer Research, Royal Marsden Hospital, UK, November, 1997.	Dr. Geetha N. Asst. Prof. in Medical Oncology	"	Annual conference of Indian Society of Haematology and Blood transfusion, Calcutta, December, 1997.
					DRL 301, Droloxifene trial meeting, Goa, April, 1997.

	Faculty member, CME on breast neoplasms, Trivandrum, July, 1997.	Dr. Kannan S Asst. Prof in Basic Research	17th annual conference of the Indian association for cancer research, Calcutta, January, 1998.
Ms. Grijja K Staff Nurse	Training on HIV and AIDS for Nurses, Trivandrum, May, 1997	A. S. Krishnakumar Asst. Prof. in Imageology	Annual conference of endocrine society of India, Trivandrum, May, 1997.
Ms. Grijja C Staff Nurse	Training on quality assurance of patient care in medical Wards, Trivandrum, June 1997.	"	Workshop for the radiographic technologists, Trivandrum, November, 1997.
Dr. Gladys Jaevy Asst. Prof. of Anaesthesia	International update on pain, Mumbai, November, 1997.	"	CME of AORI, Trivandrum, December, 1997.
Ms. Gracy M Staff Nurse	Training on HIV and AIDS for Nurses, Trivandrum, May, 1997	Dr. Krishnan Nair M. Director	Discussion with Dr. Federic Welsch, NCI and human resource development with Mayo clinic, USA, April-May, 1997.
Ms. Helen B.R.C Staff Nurse	Training on HIV and AIDS for Nurses, Trivandrum, May, 1997.	"	Atlas trial co-ordinator meeting, Oxford, UK, September, 1997.
Dr. M Iqbal Ahamed Assoc. Prof. in Surgical Oncology	International workshop on hepatobiliary surgery, Bombay, 1997.	"	9th International brachytherapy conference, USA, September, 1997.
"	International workshop on therapeutic GI endoscopy, Hyderabad, November, 1997	Ms. Kumari Thankam Staff Nurse	The foundation course in palliative care, Calicut, November, 1997.
"	Faculty member, CME on applied nutrition Trivandrum, January, 1998.	"	3rd International Seminar on Psycho-Oncology Mumbai, February, 1998
Dr. Jayasree K Asst. Prof. in Cytopathology	National IAC conference, New Delhi, November, 1997.	"	2nd International hospice conference, Mumbai, February, 1998.
"	IAPM meeting, Kerala chapter, Alleppey, May, 1997.	Dr. Kusumakumary Assoc. Prof. in Paediatric Oncology	1 st National Conference of Paediatric Haematology Mumbai, November, 1997.
"	Workshop on gynaecological cytopathology, New Delhi, November, 1997.	"	Annual Conference of IAP, Kochi, January, 1998.
"	CME on concepts and critical issues in Fine needle aspiration cytology, New Delhi, November, 1997.	Ms. Laila K.P Staff Nurse	Training on HIV and AIDS for Nurses, Trivandrum, May, 1997
"	Workshop on electron microscopy, Trivandrum, December, 1997.	Ms. Latha P.T Social Investigator	Faculty member. Symposium on principles of ethics in health care, Calicut, November, 1997.
"	CME on Paediatric Oncology, Trivandrum, January, 1998.	"	3rd International seminar on psycho-oncology, Mumbai, February, 1998.
Ms. Jikky M Staff Nurse	Conference on cancer awareness, education and detection CAED'97, Coimbatore, November, 1997.	"	2nd International hospice conference, Mumbai, February, 1998.

Dr. Manoj Pandey Lecturer in Surgery	International Symposium on breast cancer and IASO MIDCON'97. Udalpur September 1997.	"	Invited talk, symposium on medical physics & radiation protection, Mysore, July, 1997.
"	Invited lecture. Recent advances in surgery : An update and north zone CME, Varanasi, November, 1997.	"	Annual meeting of ARI Kerala Chapter, February, 1998.
"	North zone conference of Indian Association of Urology. Varanasi, November, 1997.	Palliative Care Nurses(RCC)	Training on palliative care, Trivandrum, February, 1998.
"	International Federation of head and neck oncologic societies. Asia-Pacific Congress, Mumbai, December, 1997.	Ms. Philomina Joseph Head Nurse	The foundation course in palliative care, Calicut, November, 1997.
"	Invited lecture. ASICON'97 Annual conference of association of surgeons of India, Bangalore, December, 1997.	Dr. Prabha Balram Addl. Prof. of Basic Research	Invited speaker, 17th annual convention of the Indian association for cancer research, Calcutta, January, 1997.
"	ASICON'98, Annual Kerala Chapter, ASI conference, Kottayam, February, 1998.	Sri. Prasanna Kumary .S Staff Nurse	Vascular Access Training Programme, Mumbai, April, 1997.
Ms. Marykutty Mathew Staff Nurse	Training on HIV and AIDS for Nurses, Trivandrum, May, 1997	Dr. Rachel Cherfan Koshy Asst. Prof. of Anaesthesia	2nd International hospice conference, Mumbai, February, 1998.
Sr. Mary Tom Staff Nurse	The foundation course in palliative care, Calicut, November, 1997.	"	5th International conference of IAPC, Mumbai, February, 1998.
Ms. Mini R.S Staff Nurse	Training on HIV and AIDS for Nurses, Trivandrum, May, 1997.	Dr. Radhakrishna Pillai M. Assoc. Prof. in Laboratory Medicine & Tumour Biology	Invited speaker, National Workshop on Nuclear Medicine, Trivandrum, India, February, 1997.
Dr. Molykutty John Lecturer in Basic Research	17th annual convention of the Indian association for cancer research, Calcutta, January, 1998.	"	Invited speaker. National Symposium on Reproductive Biology and Comparative Endocrinology, Trivandrum, 1998.
"	Workshop on research methods in oncological studies with computer, July, 1997.	Dr. K Ramachandran Assoc. Prof. of Imageology	CME programme on radiology, Trivandrum, October, 1997.
Dr. Namrata Dhakad Asst. of Surgical Oncology	Mid term conference of Indian association of surgical oncology, Udaipur, September, 1997.	"	Workshop on quality assurance in radiotherapy and radiodiagnosis, Trivandrum, November, 1997.
"	Workshop on minimally invasive surgery in gynaecological and surgical endoscopy, Trivandrum, November, 1997.	"	41st state annual conference of Indian medical association, Mavelikkara, November, 1997.
"	CME on Obs. and Gyne, Trivandrum, December, 1997.	Dr. Raghu Ram K. Nair Asst. Prof. in Radiation Physics	Training on MCA Gamma ray spectrometry for soil analysis, Mumbai, Nov.-Dec., 1997.
Dr. Padmanabhan V Prof. In Radiation Physics	STEC Review meeting, Trivandrum, August, 1997.	"	International Symposium on recent advances in genetic epidemiology and population monitoring, Madras, March, 1998.

Dr. Rajan B. Prof. In Radiotherapy	ATLAS trial Co-ordinators meeting, Oxford September, 1997.	"	23rd annual conference of Indian society of human genetics, New Delhi, December, 1997.
"	The Institute of Cancer Research Meeting Brighton, UK, September, 1997.	"	DAE symposium of genetic epidemiology and population monitoring, Madras, 1998.
"	12th International conference on brain tumour research and therapy, Oxford September, 1997.	"	One month training course on molecular genetic techniques, Japan, May, 1997.
"	Collaborators meeting for the trial gemcitabine Vs. Epirubicin in elderly patients with metastatic breast cancer, Vienna, March, 1998.	"	International workshop on human chromosome 21, Germany, 1997.
Mr. Rajasekharan Nair Medical Records Officer	Symposium on principles of ethics in health care, Calicut, November, 1997.	"	DBT sponsored winter school on human genetics, concepts, paradigms and methods, Calcutta, January, 1998.
Dr. K. Ramadas Assoc. Prof. in Radiotherapy	Research co-ordination for the randomised clinical trial of radiotherapy combined with mitomycin C in the treatment of advanced head and neck tumors, Mumbai, December, 1997.	Ms. Regila Beegum Staff Nurse	Training on quality assurance of patient care in medical Wards, Trivandrum, June, 1997.
"	Asia pacific head and neck cancer congress, Mumbai, December, 1997.	Dr. Rekha A Nair Asst. Prof. in Cytopathology	NCI meeting, Madras, May, 1997
Dr. Raveendran Pillai K Cytotechnologist	21st national conference of electron microscopy society of India, Trivandrum, December, 1997.	"	Faculty member, Indian Association of Pathologists and Microbiologists meeting, Kerala chapter, Alleppey, May, 1997.
"	17th annual convention of Indian Association of Cancer Research, Calcutta, January, 1998.	"	Workshop on electron microscopy, Trivandrum, December, 1997.
"	International CME on clinical radiobiology, Trivandrum, January, 1997.	Dr. Remani P Asst. Prof. of Cancer Research	10th Kerala Science Congress, Kozhikode, January, 1998.
"	NEAC symposium on medical plants, Trivandrum, February, 1997.	"	Training on methods to evaluate mammalian cell survival and cytogenetic changes, manipal, June, 1997.
Dr. Ravindran Ankathil Assoc. Prof. in Basic Research	Invited speaker, UICC symposium of familial cancer and prevention, Japan, May, 1997.	Dr. K Sasidharan Prof. of Imageology	Invited talk, IMA, Trivandrum chapter, June, 1997.
"	Faculty member, CME on breast neoplasms, Trivandrum, July, 1997.	"	Invited talk, IMA, Kollam chapter, August, 1997.
"	18th annual conference of Indian association of biomedical scientists, New Delhi, October, 1997.	"	Workshop on quality assurance in radio- therapy and radiodiagnosis, Trivandrum, November, 1997.
		"	Invited talk, IMA state conference, Mavelkkara, November, 1997.
		"	Dr. Padmanabhan memorial oration, Assoc. of oncologists of India, Trivandrum, December, 1997.

Ms. Shamla Beevi
Staff Nurse

Ms. Sharo Thampy
Staff Nurse

Ms. Sisy Das
Staff Nurse

Dr. Sreedevi Amma N
Deputy Director &
Prof. of Cytopathology

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Dr. A. Sreekumar
Lecturer in Nuclear
Medicine

Mr. Sreekumar C.
Social Investigator

Training on HIV and AIDS for Nurses,
Trivandrum, May, 1997.

Conference on cancer awareness,
education and detection CAED'97,
Coimbatore, November, 1997.

Training on HIV and AIDS for
Nurses, Trivandrum, May, 1997.

Faculty member, international expert
conference on diagnostic cytology towards
the 21st century, Hawaii, USA, June, 1997.

WHO workshop on national cancer control
programme (faculty member), Allahabad,
September, 1997.

Faculty member, 27th Annual national
conference, IAC, New Delhi, November,
1997.

Workshops on Gynaecologic cytopathology
and colposcopy in Early diagnosis of
carcinoma cervix. New Delhi, November,
1997.

Governing body meeting of amala cancer
hospital and research centre, Trissur,
March, 1997.

CME on breast neoplasms, Trivandrum,
July, 1997.

CME on recent trends in medical laboratory
technology, Trivandrum, August, 1997.

Annual meeting of AROI - Kerala chapter,
December, 1997.

Governing body meeting of District cancer
society, Ernakulam, March, 1998.

Symposium on treatment plan optimisation
in radiation therapy. New Delhi, April,
1998.

Symposium on principles of ethics in health
care. Calicut, November, 1997.

Mr. Syam Kumar
Staff Nurse

Mr. Vijaya Puthusseril
Chief nursing officer

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Training on HIV and AIDS for Nurses,
Trivandrum, May, 1997

Resource person, Nurses' conference,
Ernakulam, April, 1997.

Conference on cancer awareness, educa-
tion and detection CAED'97, Coimbatore,
November, 1997.

3rd International Seminar on Psycho-
Oncology Mumbai, February, 1998

2nd International Hospice conference,
Mumbai, February, 1998.

PAPERS PRESENTED IN CONFERENCES, SEMINARS, WORKSHOPS ETC.

1. Aleyamma Mathew. Multiple logistic regression analysis and Techniques of Survival analysis (invited lectures). Workshop on research methods in oncological studies with computer applications, New Delhi, July, 1997.
2. Aleyamma Mathew. Role of statistics in medical field (invited lecture). Department of statistics, University of Kerala, Trivandrum, February, 1998.
3. Anitha Mathews. Prognostic factors in breast cancer (invited lecture). CME on breast neoplasms, Trivandrum, July, 1997.
4. Anitha Mathews. Villonodular papillary adenocarcinoma of cervix. IAPM State chapter meeting, Alleppey, May, 1997.
5. Babu Mathew. Prevalence of tobacco, alcohol habit in Trivandrum, India. World tobacco control conference, China, August, 1997.
6. Babu Mathew. Genotoxicity of 22 brands of panmasala ICM brain storming session on panmasala, New Delhi, February, 1998.
7. Babu Mathew. Identification of human teeth in charged remnants as evidence. National workshop on forensic odontology, Bangalore, 1997.
8. Babu Mathew. Role of dental surgeons in early detection primary prevention of oral cancer. State level workshop on oral cancer control, Simla, March, 1998.
9. Chandralekha B. Recent developments in cytology (invited lecture). CME on recent trends in medical laboratory technology, Trivandrum, August, 1997.
10. Chandralekha B. Problematic cases in cervical cytology (invited lecture). Preconference workshop on gynaec cytology, IAC annual national conference, New Delhi, November, 1997.
11. Cherian M Koshy. Pre-operative symptom evaluation in surgical patients with head and neck cancer. 5th International conference of IAPC, Mumbai, February, 1998.
12. Elizabeth K Abraham. Pathology of breast cancer (Invited lecture). CME on breast neoplasms, Trivandrum, July, 1997.
13. Gangadharan P. Cancer control in India-Priorities and strategies. Cancer awareness, education, detection conference, Coimbatore, November, 1997.
14. Gangadharan VP. Management of metastatic renal cell carcinoma. Urologists association, Cochin, October, 1997.
15. Gangadharan VP. Neo adjuvant chemotherapy in osteosarcoma - RCC experience. International symposium on orthopaedics oncology, Chennai, October, 1997.
16. Gangadharan VP. GM-CSF as an adjuvant in the induction treatment of acute myeloid leukaemia. Annual conference of Indian society of haematology and blood transfusion, Calcutta December 1997.
17. Geetha N. Chemotherapy in metastatic breast cancer (invited lecture). CME on breast cancer neoplasms, Trivandrum, July, 1997.
18. Jayadevan S, Jayalekshmy P, Mani KS, Krishnan Nair M, Gangadharan P. Tobacco related cancers in rural Kerala. Cancer awareness, education, detection conference, Coimbatore, November, 1997.
19. Jayalekshmy P, Thankamani KB, Gangadharan P. Disability patterns of head and neck cancer patients. Cancer awareness, education, detection conference, Coimbatore, November, 1997.
20. Jayalekshmy P. Quality of life in long term female cancer survivors. 3rd International Seminar on Psycho-social Oncology, Bombay, February, 1998.
21. Jayasree K, Chandralekha B, Sreedevi Amma N, Elizabeth K Abraham. Diagnostic accuracy of cytology in germ cell tumours. National IAC conference, New Delhi, November, 1997.
22. Jyothish B, Ravindran Ankathil, Aleyamma Mathew, Krishnan Nair M. Risk factors for breast cancer according to family history of breast cancer. 17th Annual convention Indian Association for cancer research, Calcutta, January, 1998.
23. Kannan S, Eijichi Tahara, Raveendran Pillai K, Sujathan K, Krishnan Nair M. Telomerase activity in oral premalignant and malignant lesions. 17th annual convention of the Indian association for cancer research, Calcutta, January, 1998.

25. Krishnakumar AS. Pancreatic lesions. Role of CT. Annual Conference of Endocrine Society of India, Trivandrum, May, 1997.
26. Krishnakumar AS. Imaging with CT. Workshop for the Radiographers technologists, Trivandrum, November, 1997.
27. Kumari Thankom. Communication barriers faced by nurses. 21th International hospice conference, Mumbai, February, 1998.
28. Kusumakumari P: Neuroblastoma in children (guest lecture). 31th National Conference of Paediatric Hematology Oncology, Mumbai, November, 1997.
29. Latha PT. Clinical management of sexual issues in women with cervical cancer. Cancer awareness, education, detection conference, Coimbatore, November, 1997.
30. Manoj Pandey, Aleyamma Mathew, Iqbal M Ahmed. Recurrent soft tissue sarcoma. IASO Chapter, Annual conference of ASI, Bangalore, 1997
31. Manoj Pandey, Aleyamma Mathew, Elizabeth K Abraham, Iqbal M Ahmed. Upper aero-digestive tract melanoma. International federation of head and neck oncologic societies. Asia-Pacific congress, Mumbai, India, December, 1997.
32. Manoj Pandey, Jem Prabhakar, Aleyamma Mathew, Iqbal M Ahmed, Githa N. Malignant mucosal melanoma. International symposium on breast cancer and IASO MIDCON '97, Udaipur, September, 1997.
33. Mini BS, Sankaran Kutty P, Jayaprakash G and Prabha Balaram. Immunomodulation in rheumatoid arthritis by ayurvedic treatment. 10th Kerala Science congress, Kozhikode, January, 1998.
34. Molykutty John, Rajalekshmy TN, Swapna Enose, Krishnan Nair M, Prabha Balram. Expression of proliferating cell nuclear antigens PCNA and Ki67 in gestational trophoblastic diseases. 17th annual convention of the Indian association for cancer research, Calcutta, January, 1998.
35. NS Murthy, Aleyamma Mathew, Mati Hakama, Sasi Sharma, Atul Juneja and DK Das: Estimation of adjusted progression rates of cervical dysplasia to carcinoma in-situ for withdrawals due to surgical intervention. A multivariate approach. 15th annual conference of Indian society for medical statistics, Jaipur, December, 1997.
36. Padmanabhan V. Facts and figures about radiation (invited lecture). Symposium on medical physics and radiation protection, Mysore, July, 1997.
37. Prabha Balram. Growth factors in cancer with relevance to gestational trophoblastic diseases (guest lecture). 17th annual convention, Indian association for cancer research, Calcutta, January, 1998.
38. Prishla Varghese, Anitha Balan, Nalinakumari KR, Ramdas K and Prabha Balram : Cell cycle regulatory genes on oral cancer. 10th Kerala Science Congress, Kozhikode, January, 1998.
39. Prishla Varghese, Ramdas K, Nalinakumari KR, Anitha Balan, Asha SR, Krishnan Nair M, Prabha Balram. Effect of habit on the cell cycle regulatory genes in oral cancers. 17th annual convention Indian Association for cancer research, Calcutta, January, 1998.
40. Priya Srinivas, Elizabeth K Abraham, Sukumaran N, Iqbal Ahmed, Balaraman Nair M, Krishnan Nair M and Prabha Balaram: Prognostic value of antimetastatic protein NM23H1 and tumour suppressor protein p53 in breast cancers. 17th Annual Convention of the Indian Association for Cancer Research, Calcutta, January, 1998.
41. Priya Sreenivas, Iqbal Ahmed M, Elizabeth K Abraham and Prabha Balram. NM23H1 and C-ERB - B2 in breast cancers. National conference on molecular diagnostics, University of Kerala, June, 1997.
42. Rachel Cherian Koshy. Hospital Guidance centres in Trivandrum - Unique supportive care to patients and their families. 2nd International hospice conference, Mumbai, February, 1998.
43. Radhakrishnan, VP Gangadharan, M Balaraman Nair, M Krishnan Nair and M Radhakrishna Pillai. Programmed cell death, p53, BCL 2 & tumour proliferation in non-hodgkin's lymphoma. 17th annual convention of the Indian association for cancer research, Calcutta, January, 1998.
44. Ramachandran K. Imaging of the orbit. CME programme in Radiology in association with IR & IA Kerala Chapter, Trivandrum, October, 1997.
45. Ramachandran K. General Radiology. The time tested giant. Workshop on quality assurance in Radiotherapy and Radiodiagnosis, Trivandrum, November, 1997.

46. Ramachandran K. Ultrasound Workshop on quality assurance in Radiotherapy and Radiodiagnosis November, 1997.
47. Ramachandran K. Role of Scanning in diagnosis. Science programme broadcasted in All India Radio on 14th April, 1998.
48. Ramachandran K. Cancer awareness. Scientific seminar conducted by Peroorkada service co-operative bank for the golden jubilee celebration on 23rd December, 1997.
49. Raveendran Pillai K, Peter Koshy, Kannan S, Sujathan K, Krishnan Nair M. Role of scanning electron microscopy in predicting the malignant potential of oral leukoplakia. 21st national conference on electron microscopic society of India, Trivandrum, December, 1997.
50. Raveendran Pillai K, Peter Koshy, Kannan S, Sujathan K, Krishnan Nair M. The potential of AgNORS in early diagnosis of oral squamous cell carcinoma. A multivariate analysis. 17th annual convention of Indian association of cancer research, Calcutta, January, 1998.
51. Rekha A Nair. Current concepts in lymphoma (Invited lecture). Indian association of pathologists and microbiologists, Kerala chapter meeting, May, 1997.
52. Rekha A Nair. Molecular epidemiology of lymphoma in Kerala. NCI meeting, Madras, May, 1997.
53. Sasidharan. K: Mammography in the early detection of breast cancer. (Invited lecture) Holycross Hospital, Kottayam, June, 1997.
54. Sasidharan N. Modern diagnostic methods and their Implication on Cancer Registry. Workshop on cancer registration (ICMR), Adayar, Madras, April, 1998.
55. Shasi Sharma , NS Murthy, Sarita Sardana, Atul Juneja, DK Das and Aleyamma Mathew: Estimation of adjusted cumulative progression rates associated with loss to follow-up. 15th annual conference of Indian society for medical statistics, Jaipur, December, 1997.
56. Sibi, Manoj Pandey, Aleyamma Mathew, Elizabeth K Abraham K, Iqbal Ahmed M. Upper aero-digestive tract melanoma. Asocan 88, Kerala Chapter Annual conference, Kottayam, February, 1998.
57. Sreedevi Amma N. Epidemiology of oral and pharyngeal cancer (Invited lecture). Workshop on national cancer control programme, Allahabad, September, 1997.
58. Sreedevi Amma N. Diagnostic dilemmas in squamous cell carcinoma of the cervix (Invited lecture). Preconference workshop on gynaec cytology. 27th IAC annual national conference, New Delhi, November, 1997.
59. Sreedevi Amma N. Highlights of the International expert conference (Invited lecture) on diagnostic cytology towards the 21st century, Hawaii - 27th annual national conference of IAC, New Delhi, 1997, 47.
60. Swapna Enose, Molykutty John, Rajalekshmi TN and Prabha Balaram. Cell cycle regulatory genes p53, Rb and bcl2 in gestational trophoblastic diseases. 17th Annual Convention of the Indian Association for Cancer Research, Calcutta, January, 1998.
60. Swapna Enose, Molykutty John and Prabha Balaram : Expression and activation of c- ErbB2 and epidermal growth factor receptor in gestational trophoblastic diseases. 10th Kerala Science congress, Kozhikode, January, 1998.
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ADMINISTRATION

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Principal Secretary to Govt.
Finance Department | -do- |
| 6. | Sri P.K.Sivanandan, IAS
Principal Secretary to Govt.
Planning Department | -do- |
| 7. | Sri K.N.Kurup
Secretary to Govt.
Planning Department | -do- |
| 8. | Dr.P.Sivasankara Pillai
Director of Medical Education | -do- |
| 9. | Dr.B.Umadethan
Director of Medical Education
Thiruvananthapuram | -do- |
| 10. | Dr.S.C.Gupta, Scientist | -do- |
| 11. | Dr.M.S.Valiathan
Vice-Chancellor, Manipal Academy
of Higher Education | -do- |
| 12. | Dr.M.R.Das, Director
Rajeev Gandhi Centre, Trivandrum | -do- |

- | | | |
|-----|---|----------|
| 13. | The Secretary to Govt.
Union Ministry of Health & F.W. | -do- |
| 12. | The Director General of
Health Service
Govt. of India | -do- |
| 13. | Dr.M.Krishnan Nair
Director, RCC, Trivandrum. | Convener |

**MEMBERS OF THE EXECUTIVE COMMITTEE OF
THE REGIONAL CANCER CENTRE SOCIETY**

- | | | |
|----|---|----------|
| 1. | Sri.V.Vijayachandran, IAS
Secretary to Govt., H&FWD | Chairman |
| 2. | Sri S.Varadachari, IAS
Commr. & Principal Secretary
Finance Department | Member |
| 3. | Sri. Vinod Rai, IAS
Principal Secretary to Govt.
Finance Department | -do- |
| 4. | Sri P.K.Sivanandan, IAS
Principal Secretary to Govt.
Planning Department | -do- |
| 5. | Sri. K.N. Kurup
Secretary to Govt.
Planning Department | -do- |
| 6. | Dr.P. Sivasankara Pillai
Director of Medical Education
Thiruvananthapuram | -do- |
| 7. | Dr.B.Umadethan
Director of Medical Education
Thiruvananthapuram | -do- |
| 8. | Dr.M.Krishnan Nair
Director, RCC, Trivandrum | Convener |

BUILDING COMMITTEE MEMBERS OF THE R.C.C

- | | | |
|----|--|----------|
| 1. | Sri. Narayanan Naik
Chief Engineer,
Buildings & Local works,
P.W.D, Trivandrum | Chairman |
| 2. | Sri. T. Chandran
Chief Architect
P.W.D, Trivandrum | Member |
| 3. | Dr. B. Umadethan
Director of Medical Education,
Trivandrum. | -do- |
| 4. | Dr. M. Krishnan Nair
Director,
Regional Cancer Centre,
Trivandrum. | -do- |
| 5. | Sri. K.R. Bhaskaran Nair
Controller of Finance,
Regional Cancer Centre,
Trivandrum. | -do- |
| 6. | Sri. G. Raveendranathan Nair
Chief Engineer (Construction),
Regional Cancer Centre,
Trivandrum. | Convener |

**MAJOR DECISIONS OF THE EXECUTIVE COMMITTEE
DURING 1997-98**

A) Promotions

The following promotions were sanctioned

- | | |
|----|--|
| 1. | Dr.K.Ramadas, Dr.K.Ratheesan, Dr.Thomas Koilparambil &
Dr.Francis V James as Associate Professors and Dr. Rafeeka
Beegum as Addl. Professor in the Radiotherapy Department |
| 2. | Dr.Ravindran Ankathil as Assoc. Professor and Dr. Molykutty John
as Assistant Professor in the Cancer Research Dept. |
| 3. | Dr.Ramani S Wesley as Assoc. Prof.of Community Oncology. |
| 4. | Dr.Mary Thomas as Lecturer in Anaesthesiology. |

B) Deputation to foreign countries

The Executive Committee in its various sittings has sanctioned deputation to the following staff:

1. Dr.Ravindran Ankathil, Japan, May, 1997 & Berlin, Germany, Sept. 1997
2. Dr.V.N.Bhattathiri, Beijing, China, 1997
3. Sri. Thayal Singh Ellas, France & London, Sept.1997
4. Dr.M.Krishnan Nair, Palmsprings, USA, Oxford and Chicago, Sept. 1997.
5. Dr.Rachel Cherian Koshy, Hawai, USA, Sept.-Oct.,1997
6. Dr.Babu Mathew, Beijing, China, Aug. 1997
7. Dr.B.Rajan, Oxford, Sept.1997
8. Dr.Jem Prabhakar, London, Sept.1997
9. Dr.Prabha Balaram, Lyon, France, June-July,1997.

C) Purchase sanctioned

1. Radiotherapy Simulator
2. Spare X-ray tube for CT scanner
3. On-line Apharesis equipment

D) Appointments

The Committee resolved to appoint Sri N.Ramaswamy Iyer as Secretary to Director and Sri. V.Surendran Nair as Asst.Public Relations Officer.

The Committee resolved to appoint Part-time Consultants and On-call Consultants for the RCC in General Medicine, General Surgery & Cardiology and Endocrinology, Neurology, Psychiatry, Physical Medicine and Dental Surgery on consolidated honorarium.

The Committee resolved to create one post of Lecturer in Radiotherapy & Clinical Radiobiology, one post of Lecturer in Electronics, 10 posts of Radiographers, one post of Laboratory Technician (immunohistochemistry), one post of Dark Room Assistant.

E) Others

The Executive Committee resolved to sanction Rs.1.5 lakhs for anti-tobacco campaign (Tobacco free Schools Project) and Rs.1.5 lakhs for preparation of film to the Regional Cancer Association.

The Committee resolved to stop the private practice of all doctors in the R.C.C. and to start the Pay Clinics alternatively from 2nd October, 1997.

ENGINEERING DEPARTMENT

The civil work for the in-patient tower block was completed and all the floors were occupied except operation theatre floor. Due to the paucity of funds the new operation theatre, C.S.S.D, B.M.T area couldn't be completed.

A laundry building and a nurses hostel was completed. Power laundry equipments are being installed and tested. Two walk-in-cooler and mortuary equipments supplied by M/s. Blue Star Limited has been installed and functioning. A 625 KVA diesel generator supplied by M/s Parry Engineering & Exports Limited has been installed and is functioning. The installation of electrical equipments like main switch boards and different electrical panels supplied by various agencies are being carried out by M/s Harrisons Malayalam Limited and is in the process of completion.

LIST OF STAFF

Dr. Krishnan Nair M	Director
Dr. Sreedevi Amma N	Deputy Director
Dr. Joseph F Deputy	Director
Dr. Rajan	B Superintendent
Prof. Joseph A	Hon. Secretary (Academic)
Radiotherapy	
Dr. Krishnan Nair M	Director & Professor
Dr. Joseph F	Dy..Director & Professor
Dr. Rajan B	Supdt. & Professor
Dr. Gangadevi T	Addl. Professor
Dr. Jayaprakash P G	"
Dr. Rafeeka Beegum	"
Dr. Parameswaran S	Assoc. Professor

Dr. Raveendran Pillai K	Cytotechnologist
Sri. Sujathan K	Cytotechnologist
Dr. Lakshminarayanan	Sr. Scientific Officer
Smt. Najeeva S	Lab. technician
Smt. Brinda TP	"
Smt. Sulochana S	"
Smt. Renuka Devi V	"
Smt. Saina A	"
Sri. Nataraj A	Cytotechnician

Imageology

Dr. Sasidharan K	Professor
Dr. Alex K Ittyvirah	Assoc. Professor
Dr. Ramachandran K	"
Dr. Krishnakumar AS	Asst. Professor
Smt. Vimala B	Radlographer
Smt. Sathyalekha SI	"
Sri. Pradeep S	"
Sri. Udayakumar KR	"
Sri. Prasad PP	"
Sri. Shalleshkumar KN	"

Nuclear Medicine

Dr. Pradeep VM	Assoc. Professor
Dr. Sreekumar A	Lecturer
Smt. Sheela V	Sr. Radiographer
Sri. Jos D'Kruz	"
Smt. Suja BR	Radiographer
Smt. Shaeja SR	"
Smt. Minyamma K	RIA Technician
Smt. Bindu B	"
Smt. Sindhu P	"

Radiation physics

Dr. Padmanabhan V	Professor
Sri. Davis CA	Assoc. Professor
Sri. Thayal Singh Elias	Asst. Professor
Sri. Arunkumar LS	"
Sri. Raghuram Nair K	"
Sri. Ramabhadran P	Sr. Radiographer
Sri. Sadasivan Nair N	Radiographer

Sri. Viswanathan C	"
Smt. Seetha P	"
Smt. Suseelamma S	"
Smt. Radhamony Amma TG	"
Smt. Leela M	"
Smt. Ambili Govind K	"
Smt. Mariamma Jacob	"
Smt. Sreekala R	"
Smt. Prameeladevi T	"
Sri. Sunil Kumar S	"
Smt. Geethamma K	"
Smt. Jayasree CG	"
Smt. Vidiullatha PA	"
Smt. Sheeba DR	"
Sri. Radhakrishnan Nair T	"
Sri. Sherrif JS	"
Smt. Geetha P	"
Sri. Santhan H	"
Smt. Anitha C	Radiographer (on leave)
Smt. Sreekala D	Mould Room Technician

Cancer Research

Dr. Prabha Balaram	Addl. Professor
Dr. Ravindran Ankathil	Assoc. Professor
Dr. Kannan S	Asst. Professor
Dr. Remani P	"
Dr. Molykutty John	"
Sri. Thomas Abraham	Scientific Officer Gr. I
Smt. Bindu L	Cytotechnologist
Smt. Leela A	Sr. Animal house keeper-cum-attender
Sri. Vikraman Nair K	"

Laboratory Medicine & Tumor Biology

Dr. Radhakrishna Pillai M	Assoc. Professor
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Clinical lab

Smt. Padmavathi Amma B	Technical Officer
Smt. Usha J	Sr. Lab technician
Smt. Renuka P	"

Sri. Hariharan S
Sri. Rajesh KR
Smt. Helen B
Smt. Anitha S

Lab. technician
"
"
"

Pharmacy

Sri. Sivasankara Pillai K

Pharmacist

Information Systems Division

Sri. Jayasankar G
Sri. Manoj G
Smt. Suseela Devi B
Smt. Jayanthi JK

System Manager (on leave)
Jr. Systems Analyst
Data Entry Operator
"

Community Oncology

Dr. Babu Mathew
Dr. Remani S. Wesley
Sri. Sreekumar C

Professor (on leave)
Assoc. Professor
Social Investigator

Library and Information Service

Sri. Chandrakumaran Nair M
Smt. Sreedevikutty C
Ms. Deepika Lakshman
Sri. Vishnu V

Sr. Librarian
Typist
Library Assistant
"

Director's Office

Sri. Ramaswamy Iyer N
Smt. Savithriamma B
Sri. Antony P
Sri. Krishnan Kutty A

Secretary & CA to Director
Jr. Personal Asst.
Despatcher
Helper

Administrative Office

Sri. Bhaskaran Nair KR
Sri. Joseph PP
Sri. Rajendran R
Sri. Gnanaswaran G
Sri. Sasikummar SV
Smt. Lalitha B
Smt. Beena N
Sri. Sasikummar K

Controller of Finance
Administrative Officer
Finance Officer
Accounts Officer
Asst. Purchase Officer
Asst. Administrative Officer
Asst. Accounts Officer
Sr. Office Asst.

Smt. Shylaja C
Smt. Jumailathu Beevi KM
Smt. Remila CK
Smt. Snehalatha
Sri. Sabu SR
Smt. Sheela Kumari R
Smt. Sudevi R
Smt. Mallikadevi S
Smt. Anitha S
Smt. Usha V
Sri. Krishnan Nair P
Sri. Sreekumaran Nair P
Sri. Krishnadasan TP
Sri. Sasidharan Nair N
Sri. Devarajapanicker K
Sri. Abdul Rahiman PM
Sri. Anilkumar R
Sri. Rajayyan S
Sri. Hari C
Sri. Balachandran KG
Sri. Senan
Sri. Balachandran I
Sri. Seethalekshmy PS
Sri. Subair M
Smt. Amrithamma M
Sri. Santhosh Kumar CS
Sri. Sivan Kutty K
Sri. Sulaiman S
Sri. Vijayakumar C
Sri. Krishnankutty A

Office Asst.
"
"
"
"
Cashier
Jr. Personal Asst.
"
Confidential Asst.
Data Entry Operator
Driver Gr. J
Driver
"
"
Sr. Helper
"
"
"
"
"
"
Despatcher
Helper
"
"
"
"
"

Engineering wing

Sri. Raveendranathan Nair G
Sri. Rajan

Sri. Vijayakumar L

Sri. Asokan Nair R
Smt. Suseela P
Sri. Santhoshkumar AR

Chief Engineer Consultant
AMaintenance Engineer
(Electrical)
Maintenance Engineer
(Mechanical)
First Grade Overseer
Jr. Personal Asst.
Electrical supervisor

Sri. Rajendran KR	"
Sri. Sasidharan N	"
Sri. Rajeevan B	"
Sri. Venugopalan Nair VR	Electrician
Sri. Giji PS	"
Sri. Abraham T. Chacko	"
Sri. Silvarajan L	Electronics technician

Security Services

Sri. Vijayan Nair S	Sergeant
Sri. Thankappan Nair K	Security guard
Sri. Sasikumaran Nair R	"
Sri. Achuthan Nair	"
Sri. Sukumaran Nair G	"
Sri. Somasekharan Nair R	"
Sri. Rajeswaran KP	"
Sri. Sahadevan B	"
Sri. Sasikumaran Nair R	"
Sri. Stephenson C	"
Sri. Prabhakaran Nair B	"
Smt. Mini N	Dietitian

ECDC Ernakulam

Dr. Syamalakumari	Cytopathologist
Smt. Radha C	Cytotechnologist Gr.
Smt. Mercy Joseph	"
Sri. Jayalal Ks	Sr. Cytotechnologist
Smt. Gracy M	Staff Nurse
Ms. Lathamalathy	Cytotechnician
Sri. Dass	Helper
Sri. John Evidus	"

ECDC Palakkad

Dr. Aananda Kamath R	Cytopathologist
Ms. Veena VS	Cytotechnologist
Ms. Lakshmi S	"
Sri. James Thomas	Cytotechnician
Smt. Nirmala KC	Staff nurse
Sri. Louis TC	Helper
Sri. Soman V	Helper

Nursing Services

Vijaya Sr.	CNO & Assoc. Professor
Aleyamma M Kunappally	Head nurse
Aleykutty PM	"
Annamma Jacob	"
Geetha Kumari BS	"
Graceamma Jacob	"
Lizyamma Jacob	"
Mariamamma James	"
Modesty SD Sr.	"
Saly Abraham (on leave)	"
Ajitha.TL	Staff nurse
Aleyamma Chacko	"
Aleyamma Koshy	"
Aleyamma Mathew	"
Ambika TB	"
Ambilly S Nair	"
Ancy Jacob	"
Ancyamma.C.J	"
Anamma Joseph	"
Anilakumari S	"
Anitha Kumari.P.V	"
Anitha Paulin	"
Anitha T	"
Anithakumari Amma.T	"
Anju S	"
Beena Kumari N	"
Beena M	"
Beena Rani S	"
Benny CA	"
Bensamma Varghese	"
Biji Kunjachan	"
Biji PR	"
Bindhu B	"
Bindhu M	"
Bindu Bhaskar	"
Bindu PD	"
Chandrika.P	"
Christeen V	"
Cine VG	"

Daisy Chacko " "
 Elizabeth Eapen " "
 Elsamma Joseph " "
 Geetha KK " "
 Geetha Kumari D " "
 Girija C " "
 Girija K " "
 Gracy George " "
 Gracy M " "
 Helen BRC " "
 Illin William " "
 Indra Devi.G " "
 Indulekha KS " "
 Jaya TS " "
 Jayakumari.S.K " "
 Jessiamma John " "
 Jessy PS " "
 Jessy Thomas " "
 Jigy SP " "
 Jikky M " "
 Jini KV " "
 Jino VK " "
 Jyothi Lakshmy D " "
 Kumari Sindu S " "
 Laly Joseph " "
 Leena M V " "
 Letha M B " "
 Lija Jose " "
 Lissy CV " "
 Lissy Varkey " "
 Lizy NM " "
 Mangalam.S " "
 Manu G Zachariah " "
 Mareena Sifas " "
 Mariyamma S " "
 Mariyamma Ulahannan " "
 Mary Kutty Mathew " "
 Maya KB " "
 Mini RS " "
 Minilal KM " "

Moly MT " "
 Nazeera Beevi B " "
 Nirmala KC " "
 Nisha P Rajan " "
 Prasanna Kumari S " "
 Prasanna Peter " "
 Raejani Kumari.K.K " "
 Rajila Beegum " "
 Rani Chandran.V " "
 Reena A Thankaraj " "
 Reetha EG " "
 Rekha R " "
 Rethidevi.G.S " "
 Sajina Beegum.S " "
 Sajitha.S " "
 Salini PB " "
 Saly Kurian " "
 Saramma Baby " "
 Saraswathi P " "
 Saraswathy Amma P " "
 Shamla Beevi A " "
 Shanty Abraham " "
 Shanty.P.S " "
 Sheeba P " "
 Sheeba SV " "
 Sheeja Beegam A " "
 Sheeja MS " "
 Sheeja Rani MP " "
 Sheena K Damodharan " "
 Sheena Lal L " "
 Shema C " "
 Sherly Jacob " "
 Sherly M. " "
 Shijikumari.N.G " "
 Shobha S " "
 Shyni Mol K " "
 Sibi.K.R " "
 Siji Thomas " "
 Simmy Panikar S " "
 Sindhu GS " "
 Sindhu Mol KR " "

Director, Cancer Institute, Madras.
Director, Tata Memorial Centre, Bombay.
Director of Census Operations, Kerala
Director, Bureau of Economics and Statistics, Kerala
M/s Instrumentation Ltd., Palghat
Vice-Chancellor, University of Kerala
Vice-Chancellor, M.G. University, Kerala
Drugs Controller, Trivandrum
Director, College of Pharmaceutical Sciences, Trivandrum
Dr.P.P.Nair, Johns Hopkins University, USA
International Agency for Research on Cancer (IARC), Lyon, France
Commonwealth Scholarship Commission, London
Kerala Transport Development Finance Corporation Limited.
Sir Rattan Tata Trust, Bombay.
Dr. S.R. Uttarwar, Director, Software Technology Park, Trivandrum.
Institute for Cancer Research, Sutton, UK.
University of Leeds, UK, Kay Kendall Leukaemia Research Fund, UK.
Prof. J. Peto, Institute of Cancer Research, Sutton, UK.
Dr. T Sugahara, Japanese Research Foundation

REGIONAL CANCER CENTRE

THIRUVANANTHAPURAM

ACCOUNTS

1997-98

**REGIONAL CANCER CENTRE
(REG. No.
BALANCE SHEET AS**

PREVIOUS YEAR		LIABILITIES	CURRENT YEAR	
Rs.	Ps.		Rs.	Ps.
268534604.89		CAPITAL FUND	299549045.89	
1708239.90		SPECIFIC FUNDS	1690383.90	
15923768.04		UN-UTILISED GRANTS	27127239.40	
947758.00		STAFF WELFARE FUND	1203229.00	
361884.75		RAD. TH. RESEARCH FUND	909163.05	
29447809.10		C C L FUND	33160810.10	
6074231.52		ADV. RECD FOR RES. PROJE	4000505.05	
23330978.46		SECURED LOANS	26039967.53	
		CURRENT LIABILITIES & PROVISIONS		
10058348.55		SUNDRY CREDITORS	11086238.85	
6432359.23		OTHER LIABILITIES	8683533.93	
87123796.53		PROVN. FOR DEPRECIATION	106485771.53	
448943976.97		TOTAL	518915888.23	

Place : Trivandrum,
Dated : 17-11-98

DIRECTOR
Dr. M. KRISHNAN NAIR

**SOCIETY, TRIVANDRUM
567/81)**

AT 31ST MARCH, 1998

PREVIOUS YEAR		ASSETS	CURRENT YEAR	
Rs.	Ps.		Rs.	Ps.
265977582.82		FIXED ASSETS	283038114.91	
2954707.32		CAPITAL WORK-IN-PROGRESS	9700345.06	
30870266.00		INVESTMENTS	33002145.00	
		CURRENT ASSETS, LOANS AND ADVANCES		
6011128.00		CLOSING STOCK	3445605.00	
2069732.00		INTEREST ON DEPOSITS	1151570.00	
2929481.12		ADVANCES TO PROJECTS	3194829.70	
9537568.58		ADVANCES-OTHERS	11890438.72	
361959.00		DEPOSITS	361959.00	
5251689.12		BALANCE WITH BANKS	17271780.94	
21051.31		CASH IN HAND	86702.46	
5000000.00		GRAND-IN-TRANSIT	4500000.00	
117958811.70		INCOME & EXPENDITURE A/C	151472397.44	
448943976.97		TOTAL	518915888.23	

Notes forming part of accounts

for M/s. SEKHAR & JAYANTHI
CHARTERED ACCOUNTANTS

GNANA SEKHAR S
PARTNER

**REGIONAL CANCER CENTRE
(REG. No.
INCOME AND EXPENDITURE ACCOUNT**

PREVIOUS YEAR		Expenditure	CURRENT YEAR	
Rs.	Ps.		Rs.	Ps.
4971990.28		Opening Stock	6011128.00	
22937870.95		Purchases	22023247.72	
27690392.50		Salaries & Allowances	34917650.72	
263929.00		Uniform and Liveries	199906.75	
288447.80		Rent, Rates & Taxes	170478.10	
739376.85		Postage/Telephone/Telegram	591592.36	
469357.25		Travelling Expenses	821444.25	
704386.10		Printing and Stationery	527025.99	
725269.50		Advertisement	14377.00	
2022867.00		Electricity/Water Charges	3361778.00	
27000.00		Remuneration to Auditors	76500.00	
6198865.28		Repairs and Maintenance	6186618.25	
981747.38		Service Contract Charges	860814.17	
1687241.00		Interest and Bank Charges	3739069.00	
52697.00		Training Expenses	78084.00	
150616.00		Conference/Seminar/Workshop	150801.00	
89032.00		Computer Expenses	101446.00	
5533.75		Books and Periodicals	7511.25	
42997.10		Land Scaping and Gardening	42142.50	
422235.25		Propotionate Share to NTR	745010.80	
8150.00		Publications	0.00	
174270.55		Miscellaneous Expenses	126483.78	
10000.00		Software	0.00	
18861317.00		Depreciation	18961975.00	
0.00		Cancer Education Programme	64157.95	
89625389.52		TOTAL	99179242.59	

Place : Trivandrum,
Dated : 17-11-98

DIRECTOR
Dr. M. KRISHNAN NAIR

**SOCIETY, TRIVANDRUM
567/81)**

FOR THE YEAR ENDED 31ST MARCH, 1998

PREVIOUS YEAR			CURRENT YEAR	
Rs.	Ps.	Income	Rs.	Ps.
8820000.00		Grant-in-aid, Govt. of Kerala	11025000.00	
1112130.00		Grant-in-aid, Govt. of India	2868566.84	
	0.00	Grant- National Sav. Dept.	2000000.00	
24170259.00		Investigation Fees	29324785.00	
2836020.00		Ward Charges	3664492.00	
9367774.90		Sale Of Medicines	9368785.75	
377666.00		Intrest Income	268442.00	
190225.00		Clinical Service Charges	2833120.00	
58730.00		Training Fees	113828.00	
5000.00		Income From Projects	15000.00	
5000.00		Donation	10150.00	
346062.80		Miscellaneous Income	95688.50	
6011128.00		Closing Stock	3445605.00	
36225393.82		Excess Of Expend. over Income	34145789.70	
89625389.52		TOTAL	99179242.59	

Notes forming part of accounts

for M/s. SEKHAR & JAYANTHI
CHARTERED ACCOUNTANTS

GNANA SEKHAR S
PARTNER

**REGIONAL CANCER CENTRE
(REG. No.**

CANCER CARE FOR

INCOME AND EXPENDITURE ACCOUNT

PREVIOUS YEAR		Expenditure	CURRENT YEAR	
Rs.	Ps.		Rs.	Ps.
65000.00		Salaries & Allowances	70000.00	
2000.00		Advertisement and Publicity	69493.50	
85400.00		Printing And Stationery	34132.00	
40000.00		Postage/Telephone/Telegram	45000.00	
25512.35		Fuel Charges	21824.25	
12045.00		Maintenance	20729.00	
17043.00		Spare Parts	12489.00	
1871624.10		Reimbursement to Patients	3356281.75	
5850.00		Miscellaneous Expense	9482.00	
188510.00		Commn. to Federal Bank	90471.00	
1435437.55		Excess of Inc. over Expend.	632203.96	
3748422.00		TOTAL	4362106.46	

Place : Trivandrum,
Dated : 17-11-98

DIRECTOR
Dr. M. KRISHNAN NAIR

**SOCIETY, TRIVANDRUM
567/81)**

LIFE SCHEME

FOR THE YEAR ENDED 31ST MARCH, 1998

PREVIOUS YEAR		Income	CURRENT YEAR	
Rs.	Ps.		Rs.	Ps.
3411265.00		Interest on Fixed deposits and Investments	4362106.46	
337157.00		CCL Membership fee not Invested		
3748422.00		TOTAL	4362106.46	

for M/s. SEKHAR & JAYANTHI
CHARTERED ACCOUNTANTS

GNANA SEKHAR S
PARTNER

**REGIONAL CANCER CENTRE
(REG. No.**

SCHEDULE OF FIXED

PARTICULARS	GROSS BLOCK			
	COST AS ON	ADDITIONS	SALE/ ADJ	COST AS ON
	1.4.1997			31.3.1998
BUILDINGS OLD	860110.25	0.00	0.00	860110.25
BUILDING	27482529.71	257277.00	0.00	27739806.71
BUILDING RT	17458985.70	0.00	0.00	17458985.70
BUILDING PHASE II	78185585.99	0.00	0.00	78185585.99
BOUNDARY WALL	127118.63	0.00	0.00	127118.63
WATER SUPPLY & DRAIN	1789149.43	161838.00	0.00	1950987.43
FURNITURE & FITTINGS	7319505.43	258616.00	0.00	7578121.43
OFFICE EQUIPMENTS	1532219.99	54960.50	0.00	1637174.43
TELEPHONE EQUIPMENTS	2436181.00	232510.00	0.00	2728691.00
HOSPITAL & LAB EQUIP	58521342.97	10285172.00	0.00	68806514.07
ELE. INSTALLATION	31745208.90	3138505.00	0.00	34883713.90
FIRE DETECTION	2915035.00	826355.00	0.00	3841390.00
AIR CONDITONING	15448532.35	3000.00	0.00	15451532.35
COMPUTER HARDWARE	2241017.00	187884.00	0.00	2428901.00
GAS PLANT & CYLINDER	6035804.15	356056.00	0.00	6391860.15
VEHICLES	379329.60	0.00	0.00	379329.60
LIB. BOOKS & JOURNALS	4248831.53	1140175.59	0.00	5389007.12
LIFT & ELEVATOR	5825810.00	0.00	0.00	5825810.00
ASSETS(DONATIONS)	337812.00	0.00	0.00	337812.00
TOTAL	285277582.82	17060632.09	0.00	290038114.91

**SOCIETY, TRIVANDRUM
567/81)**

ASSETS AS ON 31-03-98

UPTO	DEPRECIATION BLOCK		NET BLOCK	
	ADDITIONS	TOTAL UFTO	AS ON	AS ON
		31.3.1997	31.3.1998	31.3.1998
372234.85	24334.00	396568.85	463481.30	487875.30
8602834.64	955344.00	9558178.64	18180526.07	18879585.07
5040302.69	720229.00	5760531.69	13097854.01	14418583.01
3359278.00	37618* 4.00	7725892.00	71464978.99	76226287.99
17001.88	4005.00	51007.88	78110.75	80116.75
385184.53	144723.00	1110204.03	80082.52	802984.90
2256862.36	528125.00	2815038.06	4782128.07	5332537.07
655744.58	147215.00	802959.58	534214.87	526469.37
638195.70	233874.00	1120069.70	609821.50	165985.80
38821751.06	4487414.00	43319165.06	26495349.01	18699591.01
10948* 26.65	5600138.00	1454634.65	20400782.25	20802012.25
947499.10	43040.00	1331542.10	2458577.90	1887585.90
8024154.40	1114100.00	9138254.40	6319237.95	7424387.95
1742932.80	274431.00	2017363.80	411647.20	48814.20
1572111.65	722382.00	2295043.65	4086816.30	4463492.50
312411.56	18394.00	325795.56	53334.04	68012.04
1747191.25	545531.00	2292822.25	5081346.06	2485700.43
2072609.35	582880.00	2655589.35	3160220.55	3753200.65
170273.90	25101.00	195374.90	142257.70	* 67538.70
87* 25786.58	18361975.00	156486771.63	177552343.38	178853756.29

SEKHAR & JAYANTHI
Chartered Accountants

Telephone: (0471) 464920
T.C. 26/1855, G.P.O. Lane
Statue, Trivandrum - 695 001

AUDITORS' REPORT

We have examined the attached Balance Sheet of the REGIONAL CANCER CENTRE SOCIETY, Regn.No.567/81, Thiruvananthapuram as at 31st March, 1998 and the Income and Expenditure Account for the year ended on that date annexed thereto and report that:

1. The said Balance Sheet, Income and Expenditure account and the schedules thereon are in agreement with books of accounts maintained by the Society.
2. We have obtained all the information and explanation which to the best of our knowledge and belief were necessary for the purpose of our audit.
3. In our opinion, proper books of accounts have been maintained by the Society.
4. In our opinion and to the best of our information and according to the explanations given to us, and subject to the following:
 - (i) Internal control in respect of fixed assets, stores and engineering items are not commensurate with the size and magnitude of activities of the society.
 - (ii) Accounts relating to various Research Projects were not audited by us.
 - (iii) Allocation of grant of Rs.295.25 lakhs received from Government of Kerala between Capital and Revenue at Rs.185.00 lakhs and Rs.110.25 lakhs respectively are made on the basis of the addition to fixed assets or construction of building during the year 1996-97 as referred to in Note-1.
 - (iv) The land assigned by the State Government Vide GO/619/88/RD dated 28-7-1988, measuring 69 cents at Palghat and the building constructed thereon for which the Patta has not been received as referred to in Note-5.

- (v) Land at Pulayanarkotta measuring 17 acres in Sy.No.2122 assigned by the Government of Kerala Vide Order No.GO/ Ms/1054/22/RD dated 17-11-1982 has not been brought to the accounts for want of clear documents of Title as referred to in Note No.6.
- (vi) The difference in the investment made against CCL FUND ACCOUNT amounting to Rs.7,497/-has been shown as Term Deposit-Suspense Account as referred to in Note No.3 and;
 - i. The Balance Sheet read together with notes thereon gives a true and fair view of the state of affairs of the society as at 31st March, 1998, and;
 - ii. The Income and Expenditure Account read together with notes thereon give a true and fair view of the deficit of the society for the year ended 31st March, 1998. Trivandrum,

for M/s.SEKHAR AND JAYANTHI
Chartered Accountants

Sd/-

S. GNANA SEKHAR
PARTNER

Place: Trivandrum,
Date: 17-11-98

SCHEDULE

NOTES FORMING PART OF ACCOUNTS

1. Out of the grant received from Government of Kerala during the Financial Year 1997-98 amounting to Rs.295.25 lakhs, an amount of Rs.185 lakhs have been transferred to Capital Fund representing Fixed Assets acquired or constructed during the year and the balance of Rs.110.25 lakhs have been treated as Revenue and taken to Income and Expenditure Account.
2. Investment against Cancer Care for Life Fund Account has been reconciled subject to a difference to Rs.7,497/- which has been shown as Term Deposit suspense under the head 'INVESTMENTS' in the Balance Sheet.
3. An amount of Rs.3,50,000/- representing unidentified credit in the account with State Bank of Travancore brought forward from previous year, has been taken into account by crediting Bank Suspense Account.
4. The land assigned by the State Government vide GO/619/88-RD dated 28.07.1988 measuring 69 cents at Palghat and the building constructed there, has not been brought to the accounts, since clear documents of title has not been received.
5. The Land at Pulayanarkotta measuring 17 acres assigned by the Government of Kerala vide Order No.GO(MS) No.1054/22/RD dated 17.11.1982 has not been brought to accounts, since the clear document of Title has not been received.
6. Claim made by the Executive Engineer, Special Building, P.W.D amounting to Rs.3,45,615/- for deposit works, carried out for RCC, has not been acknowledged as debt and hence not provided for in the accounts.
7. Stationery is accounted on cash basis and no stock in hand is taken into account as on 31st March, 1998.

8. The balance in party accounts are subject to confirmation.
9. Previous year figures have been re-grouped wherever necessary.

Place: Thiruvananthapuram,
Date: 17-11-98

M/S. SEKHAR & JAYANTHI
(Chartered Accountants)

Dr.M.KRISHNAN NAIR
DIRECTOR

S.GNANA SEKHAR
(Partner)

SIGNIFICANT ACCOUNTING POLICIES

1. The Financial Statements are prepared on historic cost convention method.
2. Fixed Assets are accounted at cost; depreciation is provided on the rates as evaluated by the management. Full depreciation for the year is provided in respect of additions.
3. Chemicals, medicines and consumables stores are valued at cost.
4. Grant from Governments are accounted, based on the sanction received.
5. Contributions in foreign currency are accounted on realisation basis.
6. Provident Fund is regularly contributed to the Employees' Provident Fund and is deposited with Regional Employees Provident Fund Commissioner Contributions towards gratuity is made through Group Gratuity Scheme of Life Insurance Corporation.

Place: Thiruvananthapuram,
Date: 17-11-98

M/S. SEKHAR & JAYANTHI
(Chartered Accountants)

DR. M. KRISHNAN NAIR
(DIRECTOR)

S. GNANA SEKHAR
(Partner)

SEKHAR & JAYANTHI
Chartered Accountants

Telephone : (0471) 464920
T.C. 26/1855, G.P.O Lane
Statue, Trivandrum-695 001

UTILISATION CERTIFICATE

Certified that the grant of Rs. 2,95,25,000/- (Rupees two crores ninety-five lakhs twenty-five thousand only) received during the financial year 1997-98 by the **REGIONAL CANCER CENTRE SOCIETY, THIRUVANANTHAPURAM** (Registration No. 567/81) from the **HEALTH AND FAMILY WELFARE DEPARTMENT, GOVERNMENT OF KERALA** as per the Government orders:

			<i>Rs. in lakhs.</i>
G.O(Rt) 1157/97/H&FWD	dated 24-4-1997		70.00
G.O(Rt) 2548/97/H&FWD	dated 21-6-1997		25.00
G.O(Rt) 3245/97/H&FWD	dated 26-8-1997		90.00
G.O(Rt) 3789/97/H&FWD	dated 27-10-1997		50.00
G.O(Rt) 4452/97/H&FWD	dated 24-12-1997		40.00
G.O(Rt) 410/98/H&FWD	dated 20-2-1998		20.25
Total :			295.25

have been utilised by the society during the Financial year 1997-98 for the purpose of overall development and maintenance of the institution and other working expenses, implementation of projects, construction of building, functioning of Early Cancer Detection Centre and National Tumour Registry.

for M/s. SEKHAR & JAYANTHI
Chartered Accountants

Place: Trivandrum
Date: 17-11-98

S. GNANA SEKHAR
(PARTNER)

SEKHAR & JAYANTHI
Chartered Accountants

Telephone: (0471) 464920
T.C. 26/1855, G.P.O. Lane
Statue, Trivandrum- 695 001

UTILISATION CERTIFICATE

Certified that an amount of Rs. 128,64,519.64 (Rupees One Crore twenty-eight lakhs sixty-four thousand five hundred and nineteen and paise sixty-four only) has been utilised out of the following grants:

Grant received during the financial year 1997-98 vide letter:

	Amount (in rupees)
(i) F. No. V. 22015/5/97-R dated 22-1-1998 from Ministry of Health and Family Welfare, Government of India, New Delhi	30,00,000.00
(ii) F. No.V. 26015/1/97-R dated 19-3-1998 from Ministry of Health and Family Welfare, Government of India, New Delhi.	45,00,000.00
Add: Unutilised grant of the year 1996-97	<u>53,64,519.64</u>
	128,64,519.64
Less: Unutilised grant carried to 1998-99	<u>N I L</u>
UTILISED GRANT DURING 1997-98	<u>128,64,519.64</u>

by REGIONAL CANCER CENTRE SOCIETY, TRIVANDRUM
during the financial year 1997-98 for acquiring equipments and spare
parts of equipments for the development of the society.

for M/s. SEKHAR & JAYANTHI
Chartered Accountants

Place: Trivandrum
Date: 17-11-98

S. GNANA SEKHAR
(PARTNER)