



**Jawaharlal Institute of Postgraduate Medical Education and Research  
(JIPMER)**  
(An Institution of National Importance under the Ministry of Health & Family Welfare,  
Govt. of India)

**Pondicherry 605006**

**Department of Medical Oncology  
PDF course in Pediatric Oncology  
Revised curriculum submitted in August 2018**

1. Name of the course: Fellowship in Pediatric Oncology

2. Name of the primary department: Medical Oncology

3. Justification for starting/augmenting the course (max. 250 words):

Pediatric cancers are highly curable malignancies. Every year 30000 new cases are detected in INDIA. At JIPMER, 150 -180 new cases attend OPD. Leukemia, Lymphoma, CNS tumours, bone & soft tissue tumors, Wilms tumor are the common pediatric malignancies seen at JIPMER. There are very few physicians trained to manage childhood cancer. This course will give an insight into the diagnostic, management and also the psychosocial aspects of childhood cancer. With the amount of work being done in the department it would be unfair if the knowledge and experience doesn't percolate down to the next generation of doctors, especially when the country is reeling under pressure from increased cancer burden. JIPMER being a national institute having presence of students from almost all states of the country has an important role to play to tackle this menace by training doctors especially oncologists for the service of the nation. Also it would be unfair to delay treatment for cancer patients considering the urgency of the situation and at the same time it would be unfair if we dilute the quality of treatment when the patient load increases. To strike a balance between this, the department needs to expand and keeping in tune with its tag of Institute of National Importance, it needs to expand its academic spectrum.

4. Duration of the course : 2 years

5. Course co-coordinator: Dr Biswajit Dubashi, Additional Professor and Head, Medical Oncology

### **General aspects**

#### **7.1 GOAL OF THE PROGRAM**

To produce a Pediatric oncologist who:

- Is capable of providing an excellent patient care in management of paediatric cancer patients.
- Possesses adequate knowledge base (both basic and applied) to effectively interact with medical colleagues in a wide range of disciplines
- Has a basic knowledge about radiotherapy facilities and paediatric surgery principles

- Should be competent in procedures like Central Venous Access device insertions, lumbar punctures, bone marrow aspiration and biopsies
- Should be well versed in managing the complications of chemotherapies
- Is a good researcher, competent teacher and an efficient administrator

## **7.2 ELIGIBILITY FOR ADMISSION**

Minimum qualification required for appearing for the entrance exam for the proposed one year fellowship program would be M.D Paediatrics / DNB Degree in Pediatrics of this Institute or any other Institute/University recognized as equivalent there to by the Medical Council of India.

## **7.3 ADMISSION PROCEDURE**

Computer Based Test (CBT) / online examination will consist of 100 MCQs in the concerned specialty and related fields. The duration of the examination will be 1½ hours. All Questions will be of one best / correct response type having four alternatives. Each answer with correct response shall be awarded four marks. More than one answer indicated against a question will be deemed as incorrect response. Negative marks will be given for incorrect responses marked correct. For every incorrect response marked as correct 1 mark will be deducted. Minimum cut-off shall be 50% for admission.

**7.4 DURATION OF THE COURSE:** 2 years

## **7.6 FACILITIES FOR TRAINING, MOU, RESEARCH OUTPUT**

The department of medical oncology is well equipped all the facilities required for running the program. Apart from these, we are also ably supported by a well-organized paediatric surgery and radiation oncology department.

## **DEPARTMENT LIBRARY FACILITIES**

The department is equipped with a scientific library with access to many e-learning facilities and journals. At present the number of books available in the department library is 29. The list is given below.

<b>SL No</b>	<b>TITLE</b>	<b>PUBLISHER</b>	<b>LIB. A/C NO.</b>	<b>YEAR</b>
1	Concise Manual of Hematology and Oncology	Berger	37598	2008
2	Clinical bone marrow and Blood Stem cell transplantation	At kinson	37599	2008
3	Hodgins's lymphoma	Hoppe	37023	2007
4	The Chemotherapy Source Book	Perry	37387	2007
5	Atlas of Clinical Hematology	H.Logger	37320	2004
7	Clinical Nutrition for oncology patients	J&B	37839	2010
8	Principles and Practice of lung cancer	LWW	38729	2010
9	Principles and Practice of Palliative care and supportive oncology	LWW	38730	2007
10	Treatment and Management of Cancer in the elderly	Taylor	38303	2006
11	Non Hodgins's lymphoma	LWW	38572	2010
13	Cancer stage Manual	AJCC Springer	40118	2010
14	Lecture Notes oncology	Bowler Blackwell	40119	2010
15	Cancer : Principles and Practice of Oncology	Devita LWW	39904	2011
17	Cancer : Principles and practice of Oncology, primer of the molecular Biology of Cancer	Devita LWW	39732	2011
18	Holland and Frei Cancer Medicine	Horg PMPH	39733	2010
19	Cancer chemotherapy and Biotherapy principles and practice	Chabner LWW	39734	2011
20	Antibiotic and chemotherapy	Elsevier	40763	2010
21	Comprehensive text Book of genitourinary oncology	LWW	40950	2011
22	Handbook of Cancer chemotherapy	LWW	41354	2012
23	Differential Diagnosis in Orthopedic Oncology	LWW	41355	2007

24	Principles and practice of Pediatric Oncology	LWW	41540	2011
25	Text Book of Uncommon cancer	Wiley	42226	2012
26	Manual of emergency medicine	LWW	41694	2011
27	Contemporary Management of Multiple Myeloma	JP	41935	2012
28	Clinical trials in oncology	Demos	42568	2010
29	Principles of Molecular Diagnostics and personalities Cancer Medicine	LWW	42351	2013

The following journals are also available for easy reference.

**NATIONAL AND INTERNATIONAL JOURNAL – Physical copy**

- A. Hematology Oncology Clinics Of North America
- B. Journal Of Clinical Oncology
- C. Indian Journal Of Cancer

**NATIONAL AND INTERNATIONAL JOURNAL – Electronic copy**

- A. Indian Journal Of Cancer
- B. Indian Journal of Medical and Pediatric Oncology
- C. Indian Journal of Pediatrics
- D. Indian Journal of Marrow and Blood Transfusion
- E. Journal Of Clinical Oncology
- F. Blood
- G. New England Journal of Medicine
- H. Pediatric Blood Cancer
- I. Annals of Oncology

**RESEARCH FACILITY**

The department has a molecular oncology lab and an active PhD program. Clinical research on a regular basis is happening in the department. The institute has well equipped research facilities in other departments like pharmacology, microbiology etc and our residents do projects in collaboration with these departments and gain hands on experience from them in the field of molecular oncology

**7.7 SUPPORTING DEPARTMENTS AND EXTERNAL ROTATION**

The departments of pediatric surgery and radiation oncology has kindly agreed to supports fellows entering this program and 2 weeks each of postings shall be given to them in these departments. The facilities they have is given below

DEPARTMENT OF PEDIATRIC SURGERY (2 weeks)

Operation theaters for all major and minor pediatric surgeries  
Intensive care facility for pediatric patients

#### DEPARTMENT OF RADIOTHERAPY (2 weeks)

The radiotherapy department has the following facilities.

Linear accelerators with facilities for image guide radiotherapy and intensity modulated radiotherapy

Brachytherapy

Cobalt machines

Medical physics department

Facilities for Total Body Irradiation

### **7.9 COURSE SYLLABUS**

#### **SYLLABUS**

##### ***Paper I (Basic Science and advances in Pediatric Oncology)***

1. Cell cycle
2. Pathology, Invasion & Metastasis
3. Etiology of Cancer
  - a. Viral
  - b. Chemotherapy
  - c. Physical
  - d. Hormonal
4. Epidemiology of Cancer
5. Principles of Cancer Management – Surgical Oncology, Radiation Therapy, Chemotherapy, Biologic therapy
6. Pharmacology of Cancer Chemotherapy
7. Clinical trials in cancer
10. Imaging Techniques of Cancer Diagnosis & Management
11. Specialized techniques of Cancer Diagnosis and Management
12. Vascular Access and Specialized Technique of drug delivery
13. Essentials of Molecular Biology
14. Molecular Biology of Cancer: Oncogenes Cytogenetics
15. Infections in cancer Patients and neutropenic patients
16. Adverse effects of treatment

17. Supportive Care and Quality of Life
18. Rehabilitation of Cancer Patient
19. Palliative care
20. Newer approaches in cancer treatment
21. Newer drugs in cancer treatment

***Paper – II Clinical Oncology (Pediatric Oncology)***

1. Leukemia
2. Lymphoma
3. CNS tumours
4. Neuroblastoma
5. Pediatric Bone tumours
6. Rhabdomyosarcoma
7. Hepatoblastoma
8. Germ cell tumours
13. Paraneoplastic Syndromes
14. Bone marrow transplant
15. Oncological Emergencies

**7.10 RESIDENT POSTING SCHEDULE**

The candidate is enriched about the subject by various methods like

CLINICAL TRAINING → involves working in the inpatient wards, Intensive care unit and the Stem Cell Transplant Unit on rotation basis. He/she will take complete care of the patient under direct supervision of the consultant where he is supposed to learn the art of decision making, communication skills with the patient and relatives, proper and judicious use of available resources and team work apart from the scientific aspects of the disease and its management. He will be also posted in outpatient clinics where he/she is expected to learn the management of chemotherapy administration protocols, day care management and long term follow up issues for survivors.

**ACADEMIC SCHEDULE** → The academic schedule in the department is as follows

Day	Concept	Description
<b>Monday</b> 7.45-8.30 am	Seminar	Various topics alternating between clinical, molecular, social oncology etc. will be discussed. On the 3rd Monday a breakfast symposium of two hours is done in association with surgical oncology department
<b>Tuesday</b> 7.45-8.30 am	Journal/ Abstract	Alternate week's journal discussion or abstract discussions are done. On journals day, 2 journals, divided between clinical topic, landmark journals, molecular, social oncology etc. will be scheduled. On days of abstract multiple abstracts of recent publications are discussed, each for 5 minutes.
<b>Wednesday</b> 7.45-8.30 am	Case discussion	Resident shall present clinical cases and discuss further issues related to it. This is usually done in association with surgical oncology departments.
<b>Thursday</b> 7.45-8.30 am	Department audit	Various audits like mortality discussion, disease specific audits, morbidity audits will be done.
<b>Friday</b> 7.45-8.30 am	Seminar	Similar to Monday seminars except for the breakfast symposium. Also invited lectures by faculties from other departments and also lectures by own department faculties will be arranged. Seminars on soft skill are also arranged.
<b>Saturday</b> 7.30-11.30 am	Grand rounds	The whole department shall discuss in detail the cases admitted in the wards, as well as other difficult decision making cases as well as details of patients related to transplant.
<b>Saturday</b> 12-1PM	Research meeting	Brainstorming session for new research ideas as well as to update the various research activities happening within the department and for PhD work review.

**SOCIAL ACTIVITIES** → Students are encouraged to take part in the various



departmental social activities, awareness campaigns, screening camps, rural clinics and so forth to increase their awareness about perceptions of the disease and its treatment in the society. This also will help improve their communication and presentation skills.

## **POSTING IN VARIOUS UNITS**

The candidate works in the department of medical oncology as following

### **A. Ward posting including ICU (8 months)**

The candidate is allotted certain beds and he is required to work up pediatric patients admitted on those beds. He plans out a diagnostic work up and treatment plan, discusses it with the concerned consultants, presents it on the grand rounds and assumes complete responsibility of the patients during their hospital stay.

### **B. OUT PATIENT DEPARTMENT (OPD) POSTING (9 months)**

The candidate is posted to day care chemotherapy clinic and various tumor clinics including Leukemia clinic, late effect clinic and manages pediatric cancer patients.

The candidates posted to these clinics will present cases and formulate treatment plan under the supervision of consultants. They are expected to see new as well as follow-up patients so as to plan out the management and assess the therapeutic responses of a particular patient.

### **C. DAY CARE AND OPD PROCEDURES (MINOR OT) POSTING (3 months)**

During this posting a candidate is expected to learn skills

- In introducing per cutaneous subclavian, internal jugular, and femoral vein catheters
- Familiarity with different venous access devices like Hickman catheter, subcutaneous port etc.
- Institution of chemotherapy and supervision of side effects
- Procedures like bone marrow biopsy, liver biopsy, trucut biopsy, lumbar puncture, intrathecal chemotherapy and aspiration of fluids.

### **D. BONE MARROW TRANSPLANTATION/ ACUTE LEUKEMIA (3months)**

During this posting the candidate will have a chance to manage the acute leukemias and will also get an opportunity to manage patients undergoing stem cell

transplantation for various cancers. Our department currently conducts both autologous and allogenic transplantations in a dedicated unit.

#### **D. ANCILLARY POSTING- (1 month)**

It will be for one month as follows:

- Pediatric surgery (**2 weeks**)
- Radiation oncology (**2 weeks**)

#### **FORMATIVE ASSESSMENT AND MONITORING DURING THE COURSE**

- The candidate will be continually during the course. The attendance will be maintained in a separate register for the course students and the quarterly attendance certificate will be submitted to the dean office along with the assessment report from the course coordinator.
- Formative assessment of the candidate's progress in clinical, and theoretical aspects will be conducted thrive during the course
- -1<sup>st</sup> assessment: between 6-7 months
- - 2<sup>nd</sup> assessment: between 12-14 months
- -3<sup>rd</sup> assessment: between 18-20 months

#### **RESEARCH**

- The candidate will be expected to conduct a short research project which is mandatory to appear for the examination.
- The project topic should be finalized within 6 months of joining the course and necessary approvals from the regulatory bodies should be sought before commencing the project. The final report of the project should be prepared in the form of a document which is feasible to be submitted for journal publication and submitted to the department. The project has to be approved by the course coordinator and the head of the department and will be forwarded to the dean.

#### **LEAVES**

For the leaves, prior permission must be obtained from the department. The leave letters must be counter signed by the course coordinator and the HOD and forwarded to the dean and academic section.

#### **EXIT EXAMINATION**

The examination will be conducted in three parts.

##### ***1. Theory paper***

##### **Paper I**

Basic science and recent advances in pediatric oncology

##### **Paper II**

Clinical Oncology (Pediatric Oncology)

## ***2. Clinical and practical***

Long case 1

Short cases 2

Spotters 2

Objective structured clinical examination- To assess clinical skills.

## ***3. Viva-voice***

Grand viva, histopathology/hemato-oncology slides, CT scans and X rays, Log Book.

### a) Examiners – Guidelines for Internal and External Examiners

The theory examination will be valued by 4 examiners independently. The practical and viva shall be conducted by 4 examiners (2 internal and 2 external examiners.)

## **7.12 EXAMINERS PANEL**

## **SAMPLE QUESTION PAPERS**

### **2 year fellowship in Pediatric Oncology**

#### **Paper – I**

#### **Basic Sciences and Recent advances in Pediatric Oncology.**

Time: 3 Hours

Max. Marks: 100

(10 x 10 =100 Marks)

1. Describe cancer cell kinetics and its clinical implications in chemotherapy
2. Predictive and prognostic molecular marker of pharmacogenomics.
3. Cancer stem cell and targeted therapy.
4. Ionising radiation and cancer.
5. Notch pathway
6. Image guided radiotherapy.
7. Cancer registry activities in India
8. Superior vena-cava obstruction syndrome
9. Biases in community screening tests
10. Newer antifungal therapy for febrile neutropenia

**2 year fellowship in Pediatric Oncology**

**Paper – II**

**Clinical Pediatric oncology and Stem cell transplantation**

Time: 3 Hours

Max. Marks: 100

(10 x 10 =100 Marks)

1. Discuss management of Bilateral Wilms tumour.
2. Discuss the evolution of chemotherapy of Acute Lymphoblastic Leukemia in children
3. Discuss the current concepts of management in a patient with Retinoblastoma.
4. Discuss the differential diagnosis of small round blue cell tumours.
5. Differential diagnosis of abdominal mass in a 10 year old child.
6. Cord blood transplant
7. Psychosexual rehabilitation for Hodgkin's Lymphoma survivors
8. Diagnosis and treatment of medulloblastoma
9. Management of Stage 1 Pediatric ovarian germ cell tumour.
10. Differentiate Sporadic and Endemic Burkitts Lymphoma.

## **EXAMINERS – GUIDELINES FOR INTERNAL AND EXTERNAL EXAMINERS**

### **BOARD OF EXAMINATION**

Two internal and two external examiners

#### **Assessment of Candidate**

1. Assessment of the three parts of the examination shall be done jointly by the members of the respective board of examiners.
2. Assessment of theory papers will be done individually by each examiner. The average of marks will be taken into consideration
3. A candidate will be declared to have qualified for the fellowship in pediatric-oncology if the candidate has satisfied the members of the respective boards of examiners individually and collectively that he/she has an adequate knowledge in all aspects of the three parts of examination. The candidate is required to score at least 50% of marks in theory separately and 50% of marks in clinical and viva-voce examination taken together.
4. A candidate whose thesis/research work has not been approved or who is unsuccessful in any part of the examination will be followed up as per institute rules.

The candidate will be guided and judged as regards his/her abilities to provide competent care to his/her patients through various means like ward rounds, discussions held in OPD/clinics and weekly academic activities. Formative assessment through internal examination will be held once in 6 months and this record will be made available at the time of final examination.

