SUMMARY OF THE SCIENTIFIC CONTRIBUTIONS

I work as a Professor at All India Institute of Medical Sciences, New Delhi. On the clinical front, I was instrumental in establishing the speciality of pediatric oncology in the Cancer Centre at AIIMS and initiated a programme of cord blood stem cell transplantation. I have performed more than 20 such transplants besides 350 autologous and allogenic transplants. As chairperson of Indian Pediatric Oncology Group (2015-17), I was instrumental in initiating 12 multicentric studies nationally.

I have already completed several research projects and published **more than 444 peer-reviewed indexed articles with 5200 citations, h-index of 32 and i10-index of 121**. Specifically, my research has focussed on establishing affordable and practical models of care which are applicable in India while simultaneously advancing science at an international level.

I have primarily worked in medical and pediatric oncology with special interest in **cancer supportive care** (this includes use of metronomic chemotherapy, development of newer anti-emetic agents, and development of various models of treatment of neutropenic fever). Other areas of interest include eye tumors, sarcomas, and laboratory research in acute myeloid leukemia (AML).

Cancer Supportive Care

Developing Effective Affordable Models of Care (Metronomic Chemotherapy) for End Stage Cancer Patients

In India, significant number of patients present in advanced stage of cancer, and after failure of multiple lines of chemotherapy, there is a need to develop cheap non-toxic modes of treatment. Our pioneering work on the largest and first ever double blind randomized controlled trial of metronomic chemotherapy (an affordable palliative treatment for majority of patients) has shown its role in non bone sarcoma solid malignancies **(JAMA Oncology- 2017, IF-32; Citations-44).** Our group has also recently shown that metronomic therapy is a cost effective alternative to pazopanib in advanced sarcomas (J Oncol Pharm Practice 2021). Thus, we have established affordable and practical models of effective care which are applicable in India for advanced palliative cancers while simultaneously advancing science at an international level.

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Developing New Antiemetic Regimens for Children Receiving High Emetogenic Chemotherapy

Our group has also focused on vomiting, one of the most dreaded side effects of chemotherapy. Sameer scientifically established role of ginger capsules as an effective antiemetic agent in high emetogenic chemotherapy through a randomized controlled trial (**PBC-2011, Citations-172**). Our pioneering work on the use of the drug aprepitant in children receiving chemotherapy, through a double-blind placebocontrolled trial (Support Care Cancer-2015, Citations-42), is widely accepted as a practice changing article in antiemetic guidelines of cancer chemotherapy. Recently, repurposing of the drug olanzapine (commonly used in psychiatric illnesses) as an anti-emetic agent through a randomized controlled trial has been another of our pioneering clinical practice changing work in the field of anti-emetic use in cancer chemotherapy (**J Clin Oncology 2020; IF-44.5**).

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Developing Effective Outpatient Models of Care for Infection Management in Cancer patients for both low risk and high risk febrile neutropenia

Our studies have shown that infections are the major cause of morbidity and the bed to patient ratio is a limitation in India. Hence, we established clinical protocols for managing neutropenic fever on an outpatient basis very early in his career. We published the largest randomized trial of oral vs intravenous antibiotics in low risk febrile neutropenia on an outpatient basis (JPHO-2009, Citations-53). He extended this work to managing consolidation therapy of AML on an outpatient basis and showed that infections are much lower in that setting, as compared to inpatient setting (Hematology-2009). Not only consolidation therapy, he has also shown that induction therapy in AML could be effectively administered in relapse setting with much lower rates of infection (PBC 2020). Realizing the menace of antibiotic drug resistance and undue use of antibiotics for long period of time, he has just published the largest study on ***early stoppage of antibiotics*** in "low risk" febrile neutropenia and has shown that antibiotics may be stopped before recovery of neutrophils (IJP 2021), and is currently conducting a study to assess the clinical efficacy and cost effectiveness of this practice in "high risk" febrile neutropenia as well (CTRI/2018/10/015994).

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Rationalizing use of Expensive Radiological Diagnosis in Lymphomas and Developing Prognostic Models of Childhood Lymphoma

In order to rationalize the use of PET CT as a diagnostic modality, we systematically established, for the first time, the role and pitfalls of PET-CT in both pediatric non-Hodgkin and Hodgkin lymphoma (**Radiology-2012, IF-11; and JNM-2017; IF-10)**.

Our group has systematically established prognostic markers for childhood lymphomas which serve as bench mark for the same in Indian setting.

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Retinoblastoma

Our systematic work on neo-adjuvant chemotherapy in advanced retinoblastoma clearly demonstrated its impact in preventing mutilating orbital exenterations (**Ophthalmology-2012, IF-12**). We demonstrated the utility of non-invasive PET scan in predicting outcome in advanced retinoblastoma (**JNM-2012, IF-10**). Our work on newly proposed MRI-based staging and new response criteria of retinoblastoma have assisted in sub-categorizing advanced retinoblastoma (**BJO-2013, IF-4.6**). Our work on relevance of VEGF in residual tumor cells post-neoadjuvant chemotherapy has suggested potential use of anti-angiogeneic therapy in retinoblastoma (**PBC-2012, IF-3**). Based on our analysis of a large patient cohort, those with localized retinoblastoma now need not undergo invasive bone marrow and cerebrospinal fluid examination for staging (**JPHO-2011; IF-1.2)**. I was included as part of SIOP-PODC committee for generating international retinoblastoma guidelines (**PBC-2013; IF-3**).

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Sarcomas

I established the medical oncology aspects of the bone and soft tissue sarcoma clinic at AIIMS, and have since then published more than 60 articles in this field, which serve as the benchmark for sarcoma outcome and prognostication in India. Our group developed prognostic models for treatment of Ewing sarcoma **(JSO-2015; Clinical Oncology-2014; JBJS-2014; Ann Thoracic Surgery-2013),** osteosarcoma **(JSO-2015; CTO-2016)** and soft tissue sarcomas **(CTO-2016)**. He established the role of dynamic MRI and PET-CT in osteosarcoma **(Pediatric Radiology-2011; Citations-100)** as well**.**

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Myeloid Leukemia: Advancement in Basic Biology

As a clinician, I gained insights in the basic lab work during my fellowship in the US and have carried forward my basic lab research in AML. Our group first showed the role of proliferating and apoptotic markers in AML **(Cytometry B-2013, PBC-2013, Hematology-2013, BCMD-2014, and CLML-2014).** We have identified the potential role of the D-loop region of mitochondrial genome in AML **(BJH-2010; IF-6.9; Citations-39)**. We have recently concluded the work as to how these mitochondrial variations are inherited (somatic or germline) in AML, and showed their prognostic significance **(Oncotarget-2019)**.

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Brief Summary of Publications

The publications are as under:

TOTAL PUBLICATIONS IN PUBMED INDEXED JOUNRNALS : 445

(222 publications as corresponding author/first author; the same are marked with # in the publication list)

- ❖ Research Paper Published in Full : 209
- ❖ Short Research Papers : 017
- ❖ Scientific Reviews : 030
- ❖ Other Publication/Reports : 189

(Expert Commentaries/Case series)

S.no.	Category	Number of publication
1	**OPHTHALMIC TUMOR (n=54)**	
	Research Papers	**33**
	Short Research papers	**5**
	Reviews	**2**
	Commentaries/Case Series (other)	**14**
2	**BONE AND SOFT TISSUE SARCOMAS (n=75)**	
	Research Papers	**39**
	Short Research	**3**
	Reviews	**6**
	Commentaries/Case Series (other)	**27**
3	**SUPPORTIVE CARE IN CANCER (n=52)**	
	Research Papers	**30**
	Short Research	**1**
	Reviews	**4**
	Commentaries/Case Series (other)	**17**
4	**LEUKEMIAS (n=123)**	
	Research Papers	**62**
	Short Research	**2**
	Reviews	**6**
	Commentaries/Case Series (other)	**53**
5	**LYMPHOMAS (n=61)**	
	Research Papers	**25**
	Short Research	**6**
	Reviews	**2**
	Commentaries/Case Series (other)	**28**
6	**OTHER SOLID TUMORS (n=49)**	
	Research Papers	**16**
	Short Research	**0**
	Reviews	**6**
	Commentaries/Case Series (other)	**27**

7	**MISCELLANEOUS (n=31)**	
	Research Papers	**4**
	Short Research	**0**
	Reviews	**4**
	Commentaries/Case Series (other)	**23**