

Pushing boundaries for better patient outcomes

In this edition of the newsletter, we shed light on the intentional actions undertaken to overcome the challenges we face in treatment of Cancers, spanning from clinical breakthroughs to community-driven initiatives.

M | O | C
Cancer Care &
Research Centre

Progressive Times In Oncology

ONCOinsight

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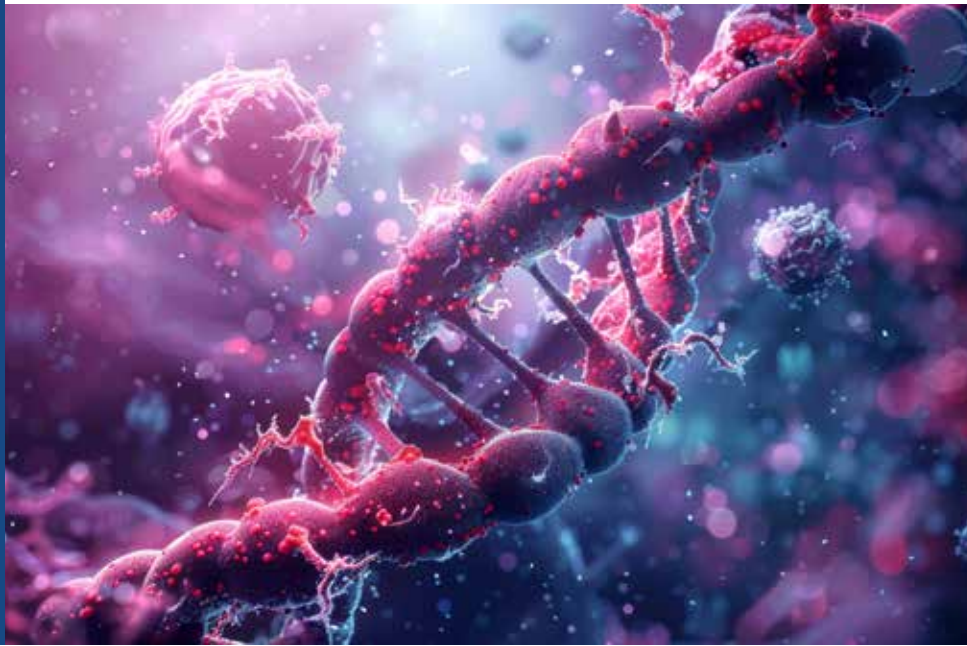
Dr. Chirantan Bose

MD, MBA,

MS Molecular Oncology

HOD - Molecular & Precision Oncology,

M | O | C, Ghatkopar & Vile Parle



Molecular Oncology – Revolutionizing Cancer Treatment Outcomes

Every Cancer at its core is coded by altered molecular genetic mechanisms that are ultimately responsible for progression, metastasis and resistance to treatment. Traditional standard of care treatment approaches are undergoing change, practically each day, with emerging molecular evidences and newer drugs. When a cancer patient presents with progression, this situation poses a challenge to the treating Oncologist and can be addressed by the application of advanced molecular technology techniques. Smart treatment choices made through molecular profiling of cancers can not just increase longevity by successfully treating even advanced cancers but also significantly enhance the quality of life and optimize cost of care.

M | O | C, being an advanced tertiary cancer care centre addresses the practical problem of challenges in cancer treatment by extensive and judicious application of Molecular oncology in day to day practice. Comprehensive molecular Oncology techniques can help to identify personalized and effective treatments for complex cancers by the use of extensive DNA sequencing, RNA sequencing and functional studies on circulating tumor cells. By applying these technologies in tandem, a personalized treatment regime is charted for even the most complex cancers.

Over the years these technologies have become extremely refined and are bringing unprecedented

benefit of personalized treatment to thousands of cancer patients.

One of the most significant contributions of molecular oncology to cancer care is the development of sensitive & specific diagnostic tools. Modern ultra-sensitive techniques can detect even single “Circulating Tumor Cells” from millions of normal blood cells and when appended with techniques such as Next-generation Sequencing (NGS), help to uncover a hitherto undeciphered face of cancer. Besides personalizing the treatment for complex cancers molecular oncology and liquid biopsy based technologies have ushered a new era in the early detection and screening of cancers as well.

The early detection of cancers brings immense benefits in terms of reducing cost of care and significantly enhancing longevity for the most difficult to treat cancers.

Liquid biopsy is a technology that unravels various pertinent molecular and cellular features of a cancer with the help of simple blood sample. Blood based liquid biopsy not just alleviates painful tissue biopsy procedures but also helps to understand heterogeneity of cancers. Liquid biopsy techniques commonly utilize the data generated from circulating tumor DNA & circulating tumor cells.

Medical management includes Targeted therapies, Immunotherapy, Chemotherapy and Hormone therapy.

Targeted therapies

Targeted therapies exploit the molecular vulnerabilities of cancer cells while sparing normal tissues. These therapies, including small molecule inhibitors and monoclonal antibodies, are designed to block specific molecular pathways essential for cancer growth and survival. The success of targeted therapies, such as Trastuzumab in HER2-positive breast cancer, exemplifies the paradigm shift towards precision medicine enabled by molecular oncology. Tyrosine Kinase Inhibitors (TKIs) like Osimertinib is an example of Target drug which has revolutionized the outcome of lung cancers, while CDK4/6 inhibitors like Palbociclib have come into mainstream management of breast cancers. Target drugs can hit specific molecular drivers that lead to cancer progression and thus may result in unprecedented benefit. Another effective category of target drugs namely NTRK inhibitors are used for treating cancers that harbor fusions in NTRK genes. Extensive genomic profiling of cancers is expanding the organ agnostic application of a host of target drugs.

Immunotherapy

Another promising therapeutic category is that of Immunotherapy drugs. The immune system plays a crucial role in cancer surveillance and eradication. Immunotherapy harnesses the power of the immune system to recognize and eliminate cancer cells. Molecular oncology has deepened our understanding of the complex interplay between tumors and the immune microenvironment, leading to the development of novel immunotherapeutic approaches. Immune checkpoint inhibitors, such as pembrolizumab and nivolumab, have shown remarkable efficacy across a spectrum of cancers, offering new hope to patients with advanced disease.

Resistance Mechanisms and Combination Therapies:

Despite initial responses to targeted therapies and immunotherapy, cancer cells can develop resistance through various mechanisms, including the emergence of new genetic mutations and adaptive changes in the tumor microenvironment. Molecular oncology techniques help to identify these resistance mechanisms, thus supporting the design of combination therapies aimed at overcoming resistance. Combinational approaches, which simultaneously target multiple signaling pathways or synergize with immunotherapy and chemotherapy hold promise for improving treatment outcomes and prolonging survival in patients with refractory cancers.



Challenges & Future Directions:

While molecular oncology has revolutionized cancer care, several challenges remain. Access to advanced molecular diagnostics and targeted therapies may be limited and expensive, exacerbating disparities in cancer outcomes. This is where the Dept of Molecular Oncology at M|O|C is bringing extremely cost effective solutions that meet the needs across socio-economic strata. Moreover, the complexity of cancer biology necessitates interdisciplinary collaboration and continued focus on innovation. The department is also harnessing artificial intelligence & machine learning algorithms to analyze large-scale genomic data, identifying novel therapeutic targets, and refining predictive biomarkers for treatment response. M|O|C is also working towards creating evidence based biobanks that will enhance drug discovery and development in India.

Molecular oncology has transformed our approach to cancer care, offering new insights into cancer biology and enabling effective treatment of even the most advanced and complex cancers. From early detection and diagnosis to precision treatment strategies, molecular oncology holds immense promise for improving patient outcomes and reducing the burden of cancer. By integrating cutting-edge research with clinical practice, M|O|C continues to harness the power of molecular oncology to conquer cancer and improve the lives of patients across India.





Dr. Pradip Kendre

DNB, DM

Consultant Cancer Physician,
M | O | C, Malad & Borivali



Impacts of Cancer on Mental Health

The diagnosis, treatment and overall experience of living with Cancer as a disease plays a critical role in creating an impact on the mental health of patients. This impact is profound and multifaceted.

Cancer diagnosis usually induces a range of emotions including fear, sadness, anxiety and depression. The uncertainty of the future, financial challenges, questionability in the effectiveness of treatment and unwanted modifications in physical appearance and functioning plays a critical role in the unfolding of mental illness in cancer patients.

On the other side, delivering the unpleasant news of the diagnosis and also encountering the journey of the cancer patients, takes a sizeable emotional toll on the treating oncologists and the Clinical caregivers. Very often they experience a disquiet and helplessness when patient does not respond to treatment or when they lose patients to the disease. Constant and contemplative empathy with the patient's sufferings and ethical dilemmas often lead to compassion fatigue and emotional drainage in the Medical caregivers.

Considering both the sides a question that commonly emerges in the mind is "Whether Cancer has an authority to dictate our lives?" If the answer to this paramount question is NO, then why do we as humans give the consent to cancer to devalue our existence and have a colossal emotional impact on our mental and physical health?

The reason of this impact is, we are living our life in cognitive slumber. We are living in a make belief

world where the society has laid norms which have become the cannons of life. Two decades ago AIDS, Diabetes were considered as death sentences but today doctors and patients have changed their perspective towards it. We have effective and modern treatments to tackle these diseases and hence these are merely considered as an interlude in our fast paced life. Minor changes in the perspective in treatment has given a boost and brought a ray of hope in the lives of AIDS and Diabetes patients. The same holds true in regards to cancer as well. We need to reflect on the fact that Cancer is a miniscule portion of our life cycle where the life force is guiding us to be cognizant of the imbalance that we have created towards our physical health and it requires timely and adequate action on it.

Society has conditioned our minds in such a way that if anyone is detected with cancer then he/ she and their families need to live in FEAR for the longest period of time. Fear was a term coined to impede us from the fear of death and enhance life, but we use this fear as a tool to perish every day. We must understand we will never be able to fix our financial, social, health related equations entirely to eliminate conflicts and uncertainty, hence the longer we hold on to this fear, the more it affects our values and our lives. Fear is a brilliant internal guide.

As far as hair loss and body disfigurement (secondary to chemotherapy and cancer) is concerned, we must understand hair style, skin color and body texture are just an external

appearance of our body and we should not connect them with our inner self. Society has defined certain benchmarks of beautification & if someone doesn't fall in place with these definitions they start devaluing the identity of an individual. At MOC our interpretation of real beauty is that it is not merely external but it radiates from within and we all should respect that.

Embracing the external world as our reality and unintentional ignorance of our real internal world puts us in "FLIGHT and FIGHT" mode. Now to flight or fight, our muscles need extra blood supply and nourishment and in order to fulfill these demands our blood circulation has to divert blood supply from central organs (visceral organ) to peripheral regions (muscle). Such a diversion leads to delay in healing of the visceral organs & the disease thus gets an extra boost to grow.

Few practical solutions to diffuse the Flight and fight modes of the life for cancer patients are:

- » Avoid using word "CANCER". Don't discuss your apprehensions or your doubts with your family members especially the scientific aspects. Discuss them with medical experts only. Try not to keep the topic alive in your daily life.
- » Avoid accumulating information about cancer from social media platforms
- » Meditation :
 - **Timing** : Early morning or before going to bed. During this time the brain emits lower beta waves where in it is effortless to reach Alpha waves. Alpha waves are the best known to decondition our subconscious mind.
 - **Place** : Sit in a calm place so that it will be easy unplug ourselves from external sensory inputs, use an eye mask, listen to soft music (don't play the music that stirs any past memories),avoid aromas of any food cooking.
 - **Open focus techniques of meditation:** We train our mind not to resist the chaos within us but to just observe it.
 - **One can focus on Respiration:** Observe the inhalation & exhalation of breath.

Meditation gives a 4 to 12 hour's window to subdue our conditioned mind, and during this golden period we need to add new empowering data in our mind

- By reading encouraging books
- By interacting with people who have an optimistic outlook and an enriched thought pattern towards life,
- By watching inspirational contents.

All of the above have to be a continuous ongoing process and need to be converted into a daily habit.

Conclusion

Our thoughts and our feelings create our personal reality & now in order to change our personal reality we need to declutter the society influenced thought processes and add new empowering inspirational perspectives to life. Meditation is the first and the easiest step to embark on the journey for an ecstatic life.

Every human has low phases in their life, but what makes them different from other lives in universe is "Ability to have control on situation based responses".

Life is beautiful,

Live it with ecstasy.





Case Discussion

An 87 year female underwent evaluation for lump in the left side of neck, dizziness, generalized weakness, weight loss with sudden fall at home in August 2023.

On Local Examination :

- Patient was frail, vitally stable with
- ECOG PS of 3
- Firm to hard lymph node on the left side of the neck.

Systemic examination :

- Patient has chronic hearing loss for which patient uses hearing aid.

HPE (Biopsy from the left cervical lymph node in Aug 2023) :

- Non-Hodgkin's lymphoma.
- IHC in Aug 2023:
- Diffuse large B cell lymphoma - left cervical lymph node. Ki67 proliferating index - 90%, CD 45 diffuse strong , CD 20 - diffuse positive , BCL2, BCL 6 , c- MYC are positive while negative for CD 10.

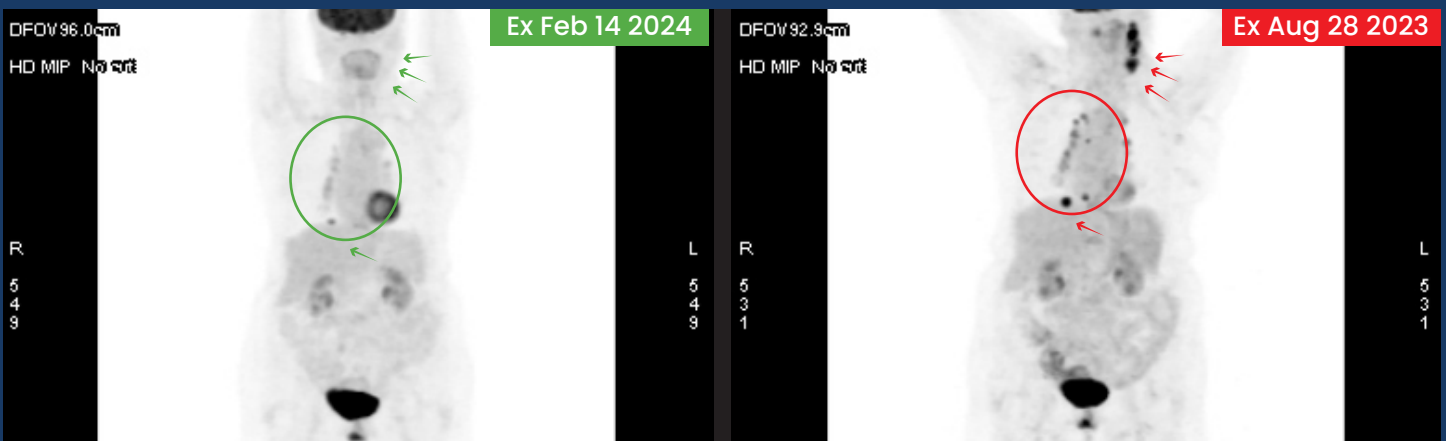
PET CT in Aug 2023 :

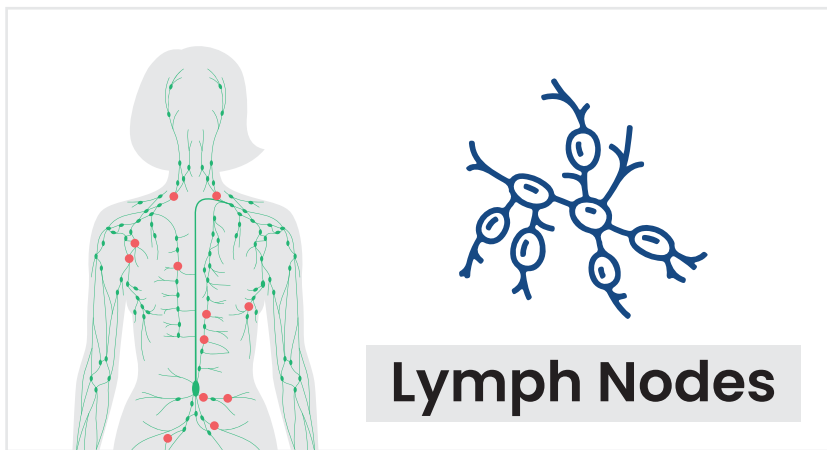
- Multiple FDG avid (SUV max 9.5-10.2) sub-centimetre sized to enlarged enhanced level IA left level IB, II, III, IV and V lymph nodes are noted largest measuring 1.6 x 1.3 cm in size -
- Multiple metabolically active sub centimetre sized to enlarged enhanced left cervical, right internal mammary , anterior mediastinal , anterior diaphragmatic, para oesophageal and abdomino - pelvic lymph nodes are noted - likely involved.
- 2D Echo - Mild concentric LVH,
- LVEF - 60 %.
- LDH - 179U/L

Treatment Given:

- Pre-phase:
 - » 1 # R-CVP
- Definitive treatment :
 - » 2 # R mini-CHOP was given after which patient developed Grade III Neutropenia and other constitutional symptoms.
 - » 3 # until the 6 # R- mini CHOP was continued with abridged doses which the patient tolerated very well.
- PET CT scan in Feb 2024 Post Completion of Treatment :
 - » Significant metabolic and morphological regression of the disease.

Comparative PET Scan





Lymph Nodes

Adults over age 65 with cancer can have a stronger reaction to chemotherapy treatments. This means that they may have worse side effects or take longer to recover after chemotherapy treatment ends.

Older adults have distinct needs before, during, and after chemotherapy treatments. Being aware of these needs and planning for them can improve how chemotherapy affects you, prevent side effects, and help maintain quality of life.

■ Coexisting conditions :

A coexisting condition is any health concern that you have at the same time as cancer. Another medical term for this is comorbidity. Anyone at any age can have coexisting conditions along with their cancer, but older adults are more likely to have more than one coexisting conditions that can affect their cancer treatment. For instance, heart problems, lung problems, diabetes, and arthritis can all impact how chemotherapy affects you.

■ Multiple medications :

Older adults are more likely to take regular medications for other health conditions. These medications might affect the chemotherapy you receive. Or chemotherapy might affect how your regular medications work.

■ Bone marrow changes :

Some people have changes to their bone marrow as they age. This means their bodies produce less red blood cells, white blood cells, and platelets than younger adults do. Chemotherapy can make bone marrow problems worse in some older adults.

■ Other physical changes :

The body changes in many different ways as we age. Some of these can overlap with or impact the effects of chemotherapy. For example, hearing loss and balance problems become more common as you age. Some chemotherapy can also cause problems with hearing loss or balance and can make existing problems worse.

■ Cognitive problems :

Cognitive problems are problems with thinking, paying attention, and memory. Older adults are more likely to have existing cognitive problems. Some chemotherapy drugs can make cognitive problems worse.



Dr. Krushna Chaudhari
DNB (Internal Med.),
DNB (Med. Onco.), ECMO
Consultant Cancer Physician,
M | O | C, Indore

Conclusion

ASCO and other international organizations recommend the use of geriatric assessments to tailor cancer treatment. They also recommend offering additional supportive care for all older adults with cancer before starting treatment.

A geriatric assessment will typically cover:

- Daily living activities
- Physical function
- Risk of falls
- Other medical conditions like BP, Diabetes etc
- Mood, anxiety, and depression
- Social activities and support network
- Cognition and memory functioning
- Nutrition



MOC Cancer Care Foundation

MOC Cancer Care Foundation envisages to touch lives of underprivileged cancer patients by enhancing the access to holistic cancer care for them, thereby improving survivorship with a longer and a better quality of life.

Among those who suffer from cancer, it is estimated that 10%-15% of their families are pushed below the poverty line due to the catastrophic cost burden of cancer treatment. Cancer treatment is primarily multi-modal in nature and each of its treatment modalities like Chemotherapy, Surgery, Radiotherapy, ranging up to latest inventions of Immunotherapy incur humongous cost to patients. On many occasions, patients are left with no choice but to interrupt treatment in-between. For some of them, cancer treatment remains a forbidden fruit.

M | O | C Cancer Care and Research Centre realised that there is a need to close this gap that can aid such patients and their families with financial and otherwise assistance, based on their eligibility. The aim of this initiative is that they can access and complete their treatment, get well, and live a reasonably healthy and quality life.

Mobile Mammography Van

MOC Cancer Care Foundation strives to work towards prevention of cancer in Indian society by mass screening and public education initiatives.

In concordance with the above goal in mind a life-saving, "Mobile Mammography Van" that is initiated to fulfil a noble cause of promulgating early diagnosis of breast cancer was officially inaugurated on 7th March 2024, Thursday; moments before their first mammography camp was conducted on the new van at Ghatkopar . It is our small contribution towards uplifting public health services in a non-communicable disease sector with a targeted impact on facilitating mass screening and early diagnosis of breast cancer, which is the leading cause of cancer deaths in India.

The plan is to hold over 200 camps and screen over 6000 women for breast cancer in the prescribed age groups and those carrying validated risk factors by the international guidelines, in its first year of its operation. "This Mammography Van also has the provision to conduct Cervical Cancer screening (PAP smear or LBC) and Oral cancer examination, making it a multi-utility van that will further screen 10000 people for the said cancers".

This Mammo Van is supported by generous CSR funding by the reputed and ethical corporate entities in India, named SBI General Insurance Company Ltd and Tata Capital Ltd. Mr. Rathin Lahiri Head of Marketing and CSR, SBI General Insurance, Mr. Sridhar Sarathy, Chief Ethics Officer & Head Sustainability, CSR- Tata Capital Limited were invited as chief guests for the inauguration ceremony. The generous donors have whole heartedly acknowledged and endorsed MOC Cancer Care Foundation on this noble initiative and their social consciousness towards easing the catastrophic and deleterious impact of cancer in the country.



Lets Come Together & help a Cancer Patient Fight better.

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**Thank you
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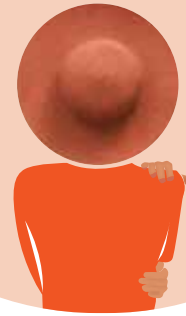
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Continuum of Flagship M|O|C Academia

M | O | C kick started the year 2024 with the "Best of SABCS" on 6th - 7th January 2024 in Mumbai which was attended by the distinguished oncology fraternity. We witnessed a breakthrough oncology academia that could reshape understanding and management of Breast cancers for our Indian Colleagues

Another differential initiative in developing Indian Clinical Consensus on Muscle Invasive and Advanced Urinary bladder Cancers was undertaken by M | O | C in February 2024. This initiative is expected to generate a guidance for Oncologists in India while treating Bladder Cancers in Indian Demographics.

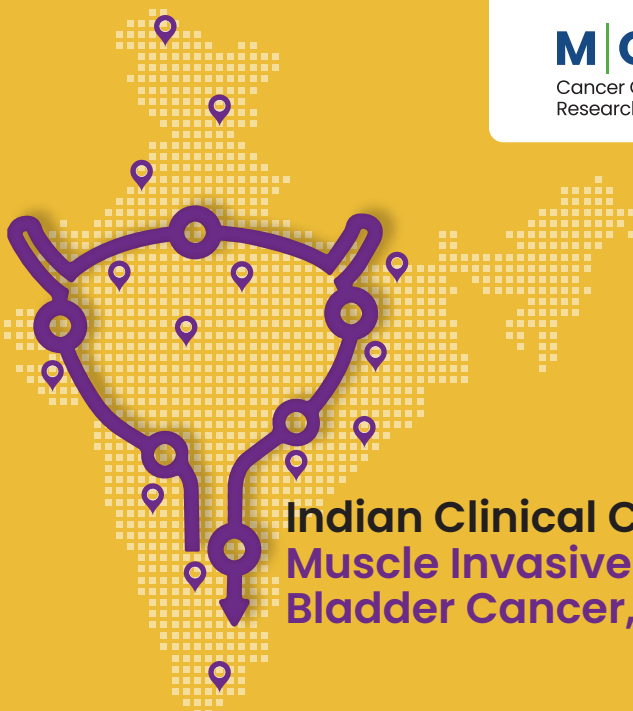
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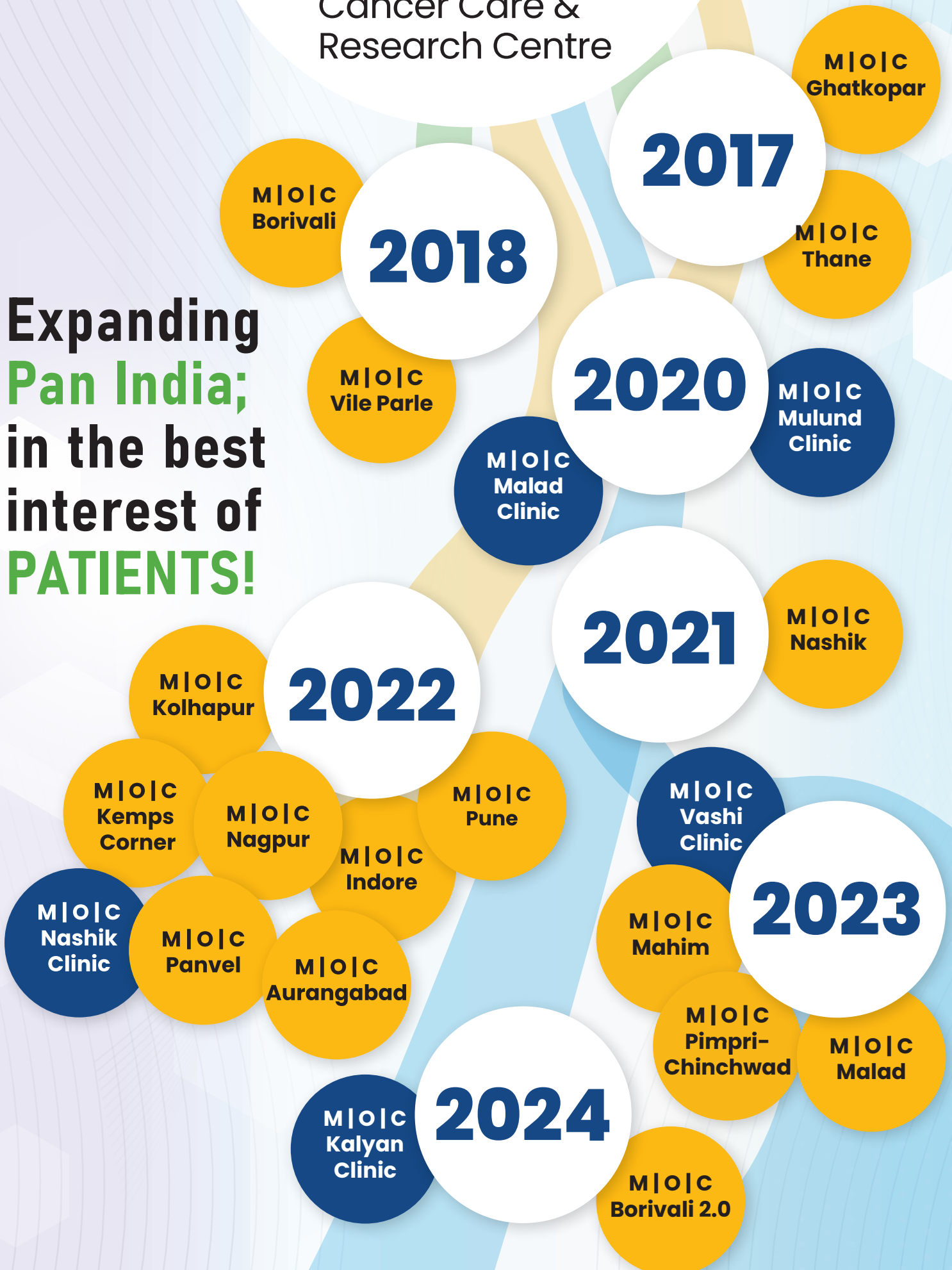
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 97697 09229

 info@mocindia.co.in

 www.mocindia.co.in