



# DigiDose

THE QUARTERLY DISPENSE



**Q & A with  
A PEDIATRICIAN**  
PAGE 06

**PROTECT YOUR SKIN  
THIS SUMMER**  
PAGE 09

**RECENT UPDATES IN  
THE PHARMA  
INDUSTRIES**  
PAGE 11



# CONTENTS

<b>EDITOR'S INK</b>	<b>03</b>
<b>SPOTLIGHT</b>	<b>04</b>
<b>Q &amp; A with Dr. Jayashree</b>	<b>06</b>
<b>PROTECT YOUR SKIN THIS SUMMER</b>	<b>09</b>
<b>RECENT UPDATES IN THE PHARMA INDUSTRIES</b>	<b>11</b>
<b>INSIGHTS</b>	<b>12</b>
<b>COMMUNITY OUTREACH</b>	
<b>Menstrual Health Awareness</b>	<b>14</b>
<b>MYTHRI Medication Donation Campaign</b>	<b>15</b>
<b>PUBLICATIONS</b>	<b>16</b>
<b>UPCOMING EVENTS</b>	<b>16</b>
<b>SSX 2024</b>	<b>17</b>
<b>CPCON 2024</b>	<b>18</b>
<b>GUEST TALK</b>	<b>18</b>
<b>ALUMNI COLUMN</b>	<b>19</b>

# EDITORIAL'S

April is a month of transition - where seasons change from sweltering summer to stormy monsoon, mid-May. This very observation led to the selection of the theme for this edition - Vaccination awareness and Summer illnesses. This edition contains an interview with Dr. Jayashree, a Professor in the Department of Pediatrics at KMC, Manipal to emphasise the importance of both childhood and adult vaccination. We hope that her experience as an expert in the matter highlights the benefits of immunisation for you all.

The feature article is a piece on “Promising new frontiers in Multiple Sclerosis Treatment”. MS is a debilitating disorder resulting in rapid decline in cognitive function of the patient. Likewise its treatment can be a matter of financial burden to the patient. The article hopes to introduce the reader to new, experimental treatment options that could decrease the burden of the disease.

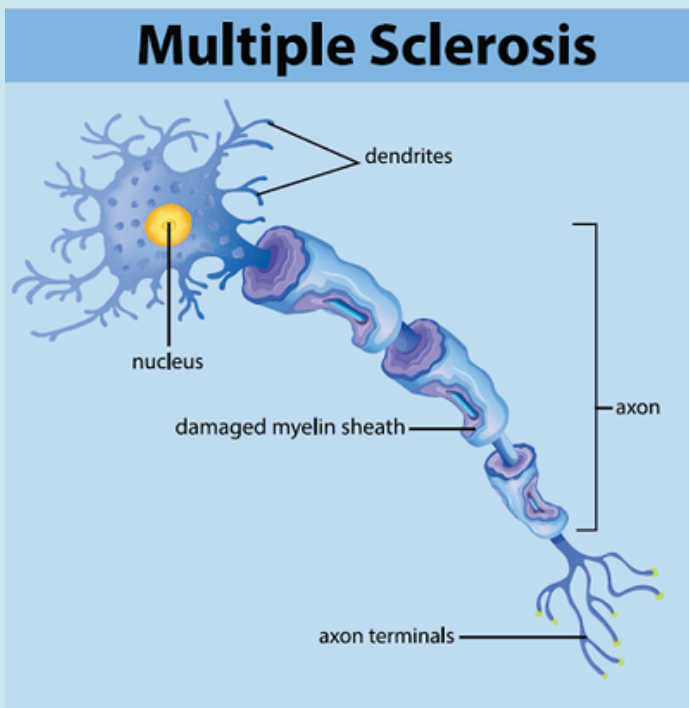
To round it all off, we have a short but informative infographic on how to keep yourself healthy in the summer- it contains tips on avoiding sunburn, heatstroke and other general healthcare tips. As is the case with all our publications we have Insights - bite sized updates from the field of pharmacy, a piece on updates in the Pharma industry, latest publications and summaries of our community outreach programs within the pages of this magazine. As always we hope that you as readers enjoy this new edition of Digidose and continue to broaden the horizons of your knowledge, and that we in PLC have taken one more step to making this information more accessible to you through the dedication and hardwork of our team. We will continue to work towards preserving the integrity of the information we make accessible to you all.

We wish you all happy reading!

~ Editorial team, PLC

# SPOTLIGHT

## *Unlocking Hope: Promising new frontiers in Multiple Sclerosis Treatment*



source:  
<https://cdn.sanity.io/images/y936aps5/production/46f78b7e7a338e2180850b269966708f70ab8cda-900x454.png>

**M**ultiple Sclerosis (MS) is a chronic autoimmune condition of the CNS, where the immune system attacks the myelin sheath of the nerves leading to scar tissue formations called sclerosis. This condition progressively worsens over time, and there is no cure for MS except for management of disease condition. The median life expectancy of MS patients is 74.7 years, with 77.2 years for women and 72.2 years for men[1]. The presence of other comorbidities such as diabetes, heart disease or hypertension decreases the life expectancy considerably.

According to the Multiple Sclerosis International Federation (MSIF) “Atlas of MS” 2020, India has a prevalence of 11 per 100,000 with a total number of 145,800 people with MS.

Over the past 30 years, the incidence of MS in India has increased exponentially. This rise is attributed to increased reporting, widespread use of magnetic resonance imaging (MRI) as a diagnostic tool and greater no. of neurologists capable of accurately diagnose the condition.

Aside from the current disease-modifying therapies (DMTs) [e.g., ocrelizumab, natalizumab, alemtuzumab, fingolimond, cladribine, diroximel fumarate, siponimod, ponesimod] and certain lifestyle modifications there appears to be a lack of cost-effective and affordable treatment for MS.

Lack of treatment options necessitates the need for research into other medications, experimental therapies, gene research and other novel therapies. In recent studies some medications such as ibudilast might help reduce disability progression in MS patients, followed by clemastine fumarate (oral antihistamine) found to help restore the protective covering around nerves in people with relapsing MS from a clinical trial [2]. As a viable alternative for patients intolerant to glucocorticoids, H.P. Acthar Gel [highly purified adrenocorticotrophic hormone (ACTH) preparation] provides extended release of ACTH following injection [2]. Plasmapheresis is considered for severe exacerbations that don't respond favorably to standard steroid treatment. Hematopoietic stem cell transplantation (HSCT) is currently being evaluated in clinical trials due to its promising nature in MS treatment. Also, neural stem cell therapy (SCT) has been shown to potentially slow down or even reverse MS effects. It is being tested in a phase-1 clinical trial involving 12 people with progressive MS showcasing that treatment is safe, tolerable and shows reduction in brain atrophy [2].

However, stem cell therapy or HSCT costs about Rs. 5 lakh-15 lakhs, which is very expensive treatment that has not been tested in larger patient groups and has yet to show results of MS disease progression. Furthermore, the rising cost of available DMTs coupled with the worsening clinical and MRI measures of most drugs (except Ocrelizumab) [3]. Thus, the only solution is to delve further into research and find other promising solutions. With this in mind, there has been a few promising leads.

According to an ENLIGHTEN Study; an open-label, multicenter, prospective, 3-year trial examining the impact of Zeposia in adult patients with relapsing MS who have been diagnosed for five years or less, it was found that FDA-approved Zeposia (ozanimod) was found to have increased cognitive function after one year on the medication [4]. The participants were DMT-naïve prior to the one-year medication period and had completed three tests assessing cognitive function namely, the California Verbal Learning Test Second Level, the Brief Visuospatial Memory Test – Revised and the Symbol Digit Modalities Test respectively and achieved clinically meaningful improvements in the scores, proving the increase in cognitive function to be true and paving the future for MS patients.

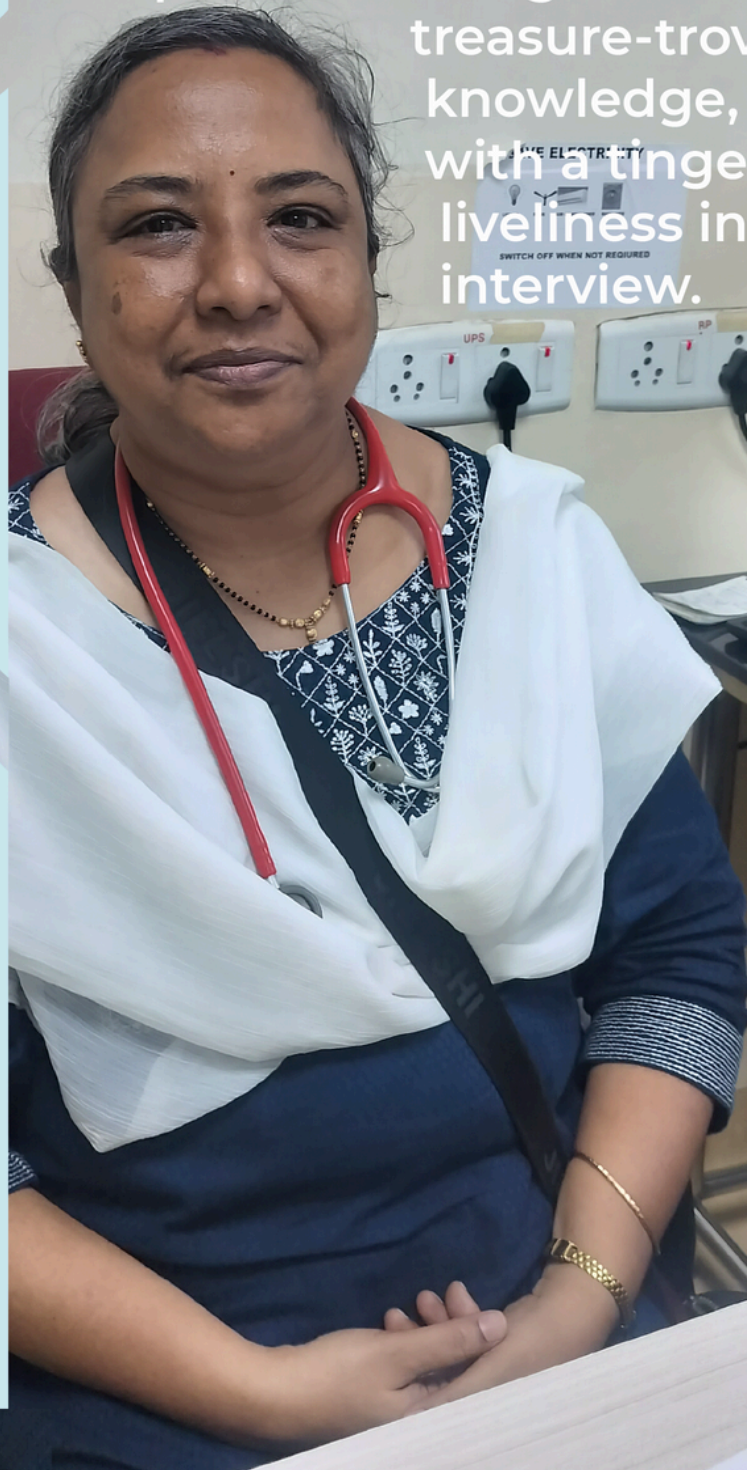
Similarly, there have been recent studies highlighting the effectiveness of Bruton's Tyrosine Kinase (BTK) inhibitors for treating relapsing and progressive MS [5]. Drugs like evobrutinib, fenebrutinib and remibrutinib have been cleared for Phases III and IV clinical trials by the FDA [6]. These drugs present several advantages; firstly, these molecules are small and can easily cross the blood-brain-barrier (BBB) compared to monoclonal antibodies. Secondly, these inhibitors affect B-cells, NK cells and primarily the microglia and astrocytes in the CNS rather than other peripheral immune cells seen in other DMTs [6], thereby proof of a significant impact in the treatment of progressive MS when their efficacy be established via human clinical trials in the near future.

#### References:

1. Lunde HMB, Assmus J et al. Survival and cause of death in multiple sclerosis: a 60-year longitudinal population study. *J Neurol Neurosurg Psychiatry*. 2017 Aug;88(8):621-625. doi: 10.1136/jnnp-2016-315238. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5537547/>
2. Annual Handbook 2023 by MSSJ Delhi
3. Zahra Sabahi, Amin Daei Sorkhabi, Aila Sarkesh et al. A systematic review of the safety and efficacy of monoclonal antibodies for progressive multiple sclerosis,
4. *International Immunopharmacology*, 2023 July; 120, 110266, ISSN 1567-5769
5. <https://doi.org/10.1016/j.intimp.2023.110266>
6. DeLuca J, Naismith RT, Morrow SA, et al. Changes in cognitive functioning over 1 year in ozanimod-treated patients with early relapsing multiple sclerosis: an interim analysis of the ENLIGHTEN Study. *ACTRIMS 2024*. Abstract P354
7. Weber MS, Nicholas JA, Yeaman MR. Balancing potential benefits and risks of Bruton tyrosine kinase inhibitor therapies in multiple sclerosis during the COVID-19 pandemic. *Neurol Neuroimmunol Neuroinflamm*. 2021;8(6):e1067. doi:10.1212/NXI.0000000000001067
8. Dendrou CA, Fugger L, Friese MA. Immunopathology of multiple sclerosis. *Nat Rev Immunol*. 2015;15(9):545-558. doi:10.1038/nri3871

# Dr. Jayashree

is a Professor in the Department of Pediatrics at Kasturba Medical College, Manipal and brings 25 years of clinical experience from the Pediatrics Department, whilst working for 6 years in the T.M. Pai Hospital. She brings forward a treasure-trove of knowledge, coupled with a tinge of liveliness into our interview.



**What are the different vaccination programs for children and adults here in KH?**

As a pediatrician, my expertise primarily lies in childhood vaccinations. We adhere to the Universal Immunization Schedule, administering vaccines such as BCG and Hepatitis B at birth, followed by doses of Pentavac, fractionated IBV, OPV, Rotavirus, and pneumococcal vaccines at 6th, 10th, and 14th weeks. At the 9th month mark, we administer the MR vaccine, pneumococcal booster, and vitamin A supplementation. At 1 year and 6 months, the second dose of MR vaccine is given along with DPT and OPV. Additionally, we provide protection against Japanese Encephalitis with two doses of the JEV vaccine.

**Does KH follow the Universal Immunization Program? What are the different vaccinations covered in this program?**

Yes, KH follows the Universal Immunization Program, and provides all essential vaccinations mentioned in the schedule.

**Apart from covered vaccinations under UIP, what are the most common vaccinations taken by the local population here?**

In addition to the vaccinations included in the Universal Immunization Program, we also administer the varicella vaccine. While the UIP covers the Measles and Rubella vaccine, we provide the MMR vaccine, which protects against Measles, Mumps, and Rubella. Furthermore, for individuals at high risk of influenza, we offer influenza vaccinations, along with meningococcal vaccinations for those deemed at high risk.

**At what age is it recommended to start vaccination?**

Vaccination can be started right after birth. At the time of birth, we provide BCG, OPV and Hepatitis vaccination.

**A lot of parents are hesitant to vaccinate their kids fearing it would overload the child's immune system. What are your thoughts on this?**

These assertions are inaccurate. Vaccinations play a crucial role in preventing highly contagious communicable diseases. They effectively shield children from contracting measles, mumps, rubella (MMR), as well as diphtheria, pertussis, and tetanus. Importantly, there is no scientific evidence supporting the notion of overloading the immune system through vaccination.

**Why is it so important to take a booster dose for certain vaccinations ?**

Taking a booster dose is important because the immunity decreases over time. When immunity decreases, we give the booster dose to allow the immunity to persist for a longer period of time.

**During the COVID-19 pandemic era, there was a lot of talk about the difference in quality of vaccines given by private practitioners and government officials. Is there any merit to these claims?**

It's not true. As far as I'm informed, the same vaccines are provided by both the government hospitals as well as private practitioners. Hence, there is no merit to these claims.

**Following up with this, a popular belief here is that natural immunity prevails over vaccine-acquired immunity in these areas. What are your thoughts on this?**

Natural immunity typically requires time to develop. At birth and during the 6th, 10th, and 14th weeks, infants do not naturally acquire sufficient immunity. Therefore, it is crucial to administer vaccinations during these periods to protect the child, as they are more susceptible to contracting diseases during these early stages. Starting vaccination at the earliest opportunity is essential for the child's protection.

**Why do people that are vaccinated fall sick more often compared to people that are unvaccinated?**

This is a common misconception. Vaccinated individuals are indeed protected against communicable diseases, and being vaccinated does not increase the risk of infection. While minor complications such as fever or pain may occur for a short duration after vaccination, they are not a major concern compared to the risks associated with contracting the diseases themselves.

**In the local population, the public place more importance on hygiene and nutrition compared to vaccination in reducing disease prevalence. Is there a reason for this?**

Hygiene and nutrition definitely goes a long way in protecting the child from infections, and helps the child fight many diseases. But vaccination is just as much important. Without vaccination, they cannot be protected against all the diseases.

**Over the years how far do you think our community has come towards achieving herd immunity? If so, it possible to replicate this nationwide?**

The Oral Polio Vaccine (OPV) is a good example - crucial in achieving herd immunity against polio in numerous nations worldwide. Through administering OPV to newborns at birth, we have successfully eradicated polio. Likewise, the initiation of the MR campaign in 2017 has notably reduced the incidence of measles in our local community, indicating the development of herd immunity against the disease.

**What are travel vaccines, and which are the more frequently administered travel vaccines in your experience in KMC?**

Travel vaccines are essential for individuals migrating to foreign countries or other regions. Commonly administered vaccines include JEV, MMR, varicella, and HBV, which should be received before migration. Foreign visitors to our country typically opt for the IPV vaccine and typhoid vaccine, both crucial for their protection. Additionally, the HAV vaccine is recommended as hepatitis-A is transmitted through contaminated food and water. Given the high prevalence of diseases such as typhoid and Hepatitis-A in India, foreign travelers should take necessary precautions upon arrival from other countries.

**Why are vaccines like HPV, HAV and HBV gaining traction among the younger population? Are there different kinds and prices of vaccines for each of the mentioned vaccines in KMC?**

The vaccines mentioned earlier are optional and not provided free of charge by the government. Individuals must bear the cost of vaccinations such as HPV and HAV. However, HBV vaccination is offered by the government at no cost. While various brands of these vaccinations may be available at differing price points, the quality remains consistent, resulting in minimal price differences between brands.

**Can pregnant women be vaccinated? What are the mandatory or common vaccinations given to pregnant women?**

Pregnant women cannot be given live vaccines. Two vaccinations that can be given is TDAP (i.e., tetanus, diphtheria, and acellular pertussis) vaccine and inactivated influenza vaccine.

**Following up on this, are there chances of the vaccine-acquired immunity passing through breast milk to infants?**

Yes, some amount of the antibody's immunity can be passed through the breast milk to the baby but that is not sufficient to give protection to the child. It is absolutely essential for children to take vaccination.

**Does KMC collaborate with or conduct any programs to generate vaccination awareness among the public?**

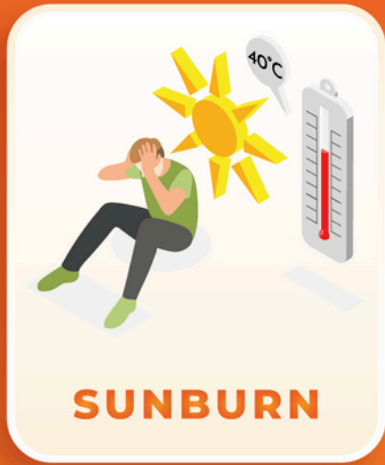
We do not have particular vaccination drives, other than pulse polio drive. We conduct regular camps to raise vaccination awareness, engaging school children and providing vaccinations through our hospital's participation. These occur once or twice monthly.

**Apart from UIP, are there any other government-level schemes that are beneficial to the patients, especially in rural areas?**

Programs such as Mission Indradanush, a government-led initiative involving visiting rural areas and vaccinating children that have missed their immunization. We coordinate with the PHCCs in order to ensure children are appropriately immunized with essential vaccines.



# PROTECT YOUR SKIN THIS SUMMER



- ◆ Overexposure to the harmful UV rays of the sun especially during the peak hours around noon is the main cause for sunburn. It may also have serious health implications in the long run, such as some cancerous melanomas.
- ◆ Symptoms associated with sun burn include redness, blistering, peeling and so on.
- ◆ Treatment: Cold damp cloth should be applied for immediate relief, aloe vera gel known for its anti-inflammatory property can be applied on any burns/redness.

## FUN FACT

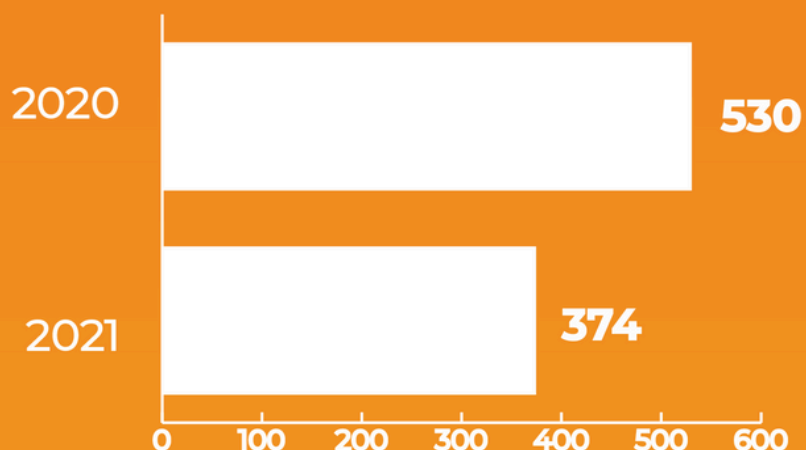


The summer flu/cold is caused by non-polio enteroviruses, unlike the common cold which is caused by rhinoviruses.

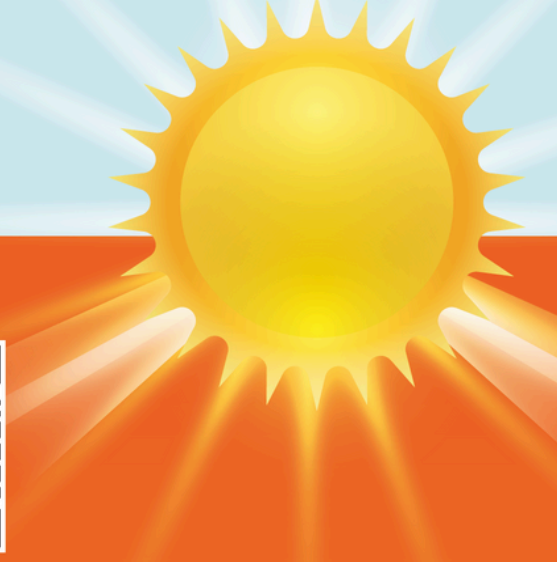


- ◆ Heatstroke is one of the more severe conditions, it may be considered as an emergency. Hence it requires immediate attention.
- ◆ Symptoms include increased body temperature around 103°F, lack of sweating, dry and hot skin, feelings of nausea and a rapid heartbeat. Sometimes seizures can also be precipitated which makes this a serious concern.
- ◆ Treatment: Immediately try to cool the body by applying ice to the neck, armpits and groin. Drink electrolyte containing solutions like ORS to reestablish hydration. Onion juice behind the ear or the bottom of your feet surprisingly works wonders.

## DEATHS DUE TO HEATSTROKE IN INDIA



# PROTECT YOUR SKIN THIS SUMMER



## FUN FACT



UV levels are independent of temperature, it cannot be seen or felt unlike infrared radiation which we sense as heat. Therefore, it is very important to wear sunscreen when the sun is out.



### GENERAL HEALTHCARE MEASURES

- ◆ A little extra effort like keeping yourself in the shade or applying sunscreen of adequate SPF can go a long way.
- ◆ Wearing covered clothing including sunglasses with special UVA and B protection is important.
- ◆ Sand and water are reflective surfaces that increase the risk of sunburn. So next time you're making beach plans remember to pack your hats and sunblock.
- ◆ Wearing loose and lightweight clothing will help improve circulation and prevent heatstroke.
- ◆ One of the keys to escaping these summertime illnesses is keeping yourself always hydrated.
- ◆ Viral infections like mumps, chicken pox, and the summer flu are prevalent during the summer months. These are highly contagious and can be prevented if proper hygiene is maintained.
- ◆ Washing your hands frequently, avoiding crowded public spaces and isolating yourself if you feel like you have any of the symptoms are necessary to combat infections.



In 2024, the revenue in the Sun Protection market in India amounts to INR US\$0.76bn.



# RECENT UPDATES IN THE PHARMA INDUSTRIES

Riya Singh

## New drugs approved in 2024

**1** **Selarsdi (Ustekinumab-aekn)** Injection by Alvotech and Teva Pharmaceuticals was approved on April 16, 2024 for the treatment of Plaque Psoriasis, Psoriatic Arthritis.

**2** **Selarsdi (Ustekinumab-aekn)** is a human interleukin-12 and -23 antagonist biosimilar to **Stelara** used for the treatment of plaque psoriasis and psoriatic arthritis

**3** Karuna Therapeutics submitted its new schizophrenia medication, called **KarXT**, to the US FDA for its approval. If the agency gives **KarXT** the green light, the drug will be the first truly new treatment for schizophrenia in decades.

NEW  
NEW  
NEW  
NEW

FIRST drug for the treatment of NASH

Non-Alcoholic steatohepatitis is a disease where in the liver builds up fat deposits excessively. Non-Alcoholic Fatty Liver Disease can be mild and symptomless, but if it progresses to NASH, it can sometimes cause people to experience liver damage similar to that caused by alcohol abuse, even if they do not drink.

The main cause includes the genetic, metabolic or microbe biome changes.

In the past few years, the number of cases for the same have increased but the treatment remained unclear. However on March 14 2024, Madrigal Pharmaceuticals won the US approval for the first drug to treat NASH: **“Rezdiffra” (Resmetirom)**, is a once-daily, oral, liver-directed THR-β agonist designed to target key underlying causes of NASH. This is a significant step forward in manufacturing medicines to treat one of the most prevailing diseases.

As the term of 2024 sets to be the one including AI and technology-based healthcare i.e. MED TECH.

Many companies around the globe are aiming to attain a global patent for Digital pills as a new class of pharmaceutical drugs. Like Proteus Digital Health INC (Redwood City, CA, USA), Otsuka Pharmaceutical Co., LTD (Tokyo, Japan).

The core abstract for digital pills informs about significant potential for savings in healthcare costs by reducing the need for emergency medical care and the hospitalization of patients.

These developers of digital pills also focus on cardiac disorders, diabetes, AIDS, and cancer.

Basically, these digital pills would aid the process of Therapeutic Drug Monitoring for example in the cases of opioid analgesics after a surgery. However there are a lot of barriers to this initiative before 100% implementation such as clinical efficacy, potency, formulations and trial period.

If these barriers can be solved, then DIGITAL PILLS will be the new form of pharmaceuticals.

“

**DIGITAL**

**PILLS WITH**

**INGESTIBLE**

**SENSORS**

”

## 1 A better view on how the opioid receptors function

We all know about how opioids are one of the widely abused drugs, they are a class of analgesics, which target opioid receptors. Overdoses due to opioids are found to be a very common cause of death among patients all over the world, especially those like fentanyl.

In order to get a better understanding of how these drugs work and their mechanism of actions, researchers have tried to get a closer look at their molecular structure. A research team led by Dr Matthias who is working at Leipzig university has finally been able to provide some insight about how opioid receptor is contribute in the regulation of not only pain, but also breathing and digestion.



## 2 Nuclear metamorphosis, a forefront for potential DNA repair cancer treatment

This research has been led by a professor Karim and his team at the Temerty faculty of medicine. It gives us insights as to how double standard breaks in DNA, which arise due to radiations and other chemical entities can be fixed by which are known as DNA damage response kinases as well

as tubulin acetyl transferases. These help recruit motor proteins which make a path through the nuclear

membrane so that the proteins involved in repair can reach the broken DNA strand. In this way, the nucleus is temporarily undergoing metamorphosis until the repair is made. This has many crucial implications for treating cancers like triple negative breast cancer.



# INSIC

## 4 Eradicate POLIO

Bharat Biotech International Limited (BBIL), the global player in vaccine and biotherapeutic innovation, and Bilthoven Biologicals B.V., (BBio) a subsidiary of Serum Institute of India Private Limited have signed a collaboration to supply the Oral Polio Vaccines with enhancement in productions and security in distribution and supply.

The two companies aim to eradicate the disease completely from the world. They are focusing to aim the lower strata and rural population around the world and eventually stabilize their OPV supply so that every individual receives the vaccine.



## DIGITAL SOUL

Imagine if Stephen Hawking could share more of his intelligence or communicate faster. Or imagine what would the world be if all the individuals without limbs or suffering from paralysis can also communicate, share their thoughts and also store them like a memory chip. Well that's what Elon Musk is doing with his neuralink "TELEPATHY"

Elon Musk is all set to disrupt the market with his neuro chip which would firstly Target the individual suffering from paralysis or depression. But Elon Musk is also set to make it a general population device which would store our thoughts as a back up device, to which we can have access to.

Isn't this the peak of the influence of AI? Or is it just the beginning?



# 3

# PHITS



## Investigational Drug shows Suppression of Multiple Sclerosis Relapses

An investigational subcutaneous injection of drug Ocrelizumab by Roche, has shown near complete suppression of Multiple Sclerosis relapses and brain lesions with a twice yearly dosing frequency. With this new development, the company seeks to provide the benefits of IV ocrelizumab with shorter injection times and less frequent doses. The results of the study showed that 97.2% of individuals had no relapse during the treatment phase and magnetic resonance imaging up to 48 weeks and patients lacked biomarkers indicating active inflammation or increased disease progression.



## Ozempic: Antidiabetic turned Weight Loss Drug

Semaglutide, more commonly known as Ozempic, is an antidiabetic drug belonging to the class glucagon-like peptide-1 receptor agonists (GLP-1s). It is one of the most essential drugs used to treat Type 2 diabetes mellitus and it acts by stimulating the release of insulin from pancreatic islet cells. They also slow gastric emptying and increase satiety. This in turn causes reduction in weight, blood pressure and lipid levels. It has recently been given approval by the US-FDA for a secondary indication: to treat non-diabetic obese patients with cardiovascular disease. This is a significant step in expanding the scope of clinical applications of GLP-1 agonists. |13

# 6

# Community Outreach activity

## Menstrual Health Awareness at Srimad Bhuvanendra High School, Karkala

**Pharmacy Literacy Club (PLC)**, Centre for Public Health Pharmacy, Department of Pharmacy Practice, MCOPS organized a Community Outreach activity on Menstrual Health Awareness at Srimad Bhuvanendra High School, Karkala, on 23rd March 2024. Miss Veena welcomed the gathering. Around 75 students participated in the program.



During the event, members of the club provided an overview of menstruation and its phases. They explained the importance of maintaining good menstrual hygiene and discussed various menstrual hygiene products, including sanitary napkins, tampons, and menstrual cups. Disposal of menstrual hygiene products and their usage was demonstrated. The advantages and disadvantages of each product were also highlighted to help students make informed choices.

In addition, an overview of cervical cancer, its causes, the importance of early detection, and available vaccines for prevention were also discussed. The school and teachers appreciated the effort of the PLC and expressed their willingness to host such events in the future, too.



# MYTHRI

## MEDICATION DONATION CAMPAIGN

at Suraksha Seva Ashram, Karkala

Pharmacy Literacy Club (PLC), Centre for Public Health Pharmacy, Department of Pharmacy Practice, MCOPS, in association with Chosen Generation Charitable Trust (CGCT), Ajjarkad, Udupi, organized a medication donation campaign named 'Mythri' at Suraksha Seva Ashram, Karkala on 30th March 2024. Medications were sponsored by Radha Medicals.



MPLC members, along with CGCT, identified the need for medications and sanitary pads for more than 75 inhabitants of Suraksha Ashram following discussions and a primary meeting in November 2023 with the ashram caretaker, Mrs. Ayesha Banu. PLC volunteers reviewed the prescriptions, and a detailed medicine information leaflet was prepared by PLC to aid the caretaker in using the medicines most appropriately. Moreover, Mr. Skanda, President of PLC, counselled the caretakers on the indications and dosing of the medicines. Ms. Chaitra, from PLC, also gave a talk on the importance of personal hygiene to the inmates.

# PUBLICATIONS

## JANUARY - MARCH 2024

- Amar Patil, Ayyappa Chagi, Pooja Gopal Poojari, Muhammed Rashid, K N Shivashankar, Girish Thunga, Sreedharan Nair. Clinical characteristics, management, outcome, and cost of stings and bites in patients admitted to a tertiary care teaching hospital. *Toxicology Research (Camb)*. 2024 Jan 13;13(1):tfae006.(Q2; IF: 2.1)
- Soumyajeet Paul, Ananya Rudra, Suparna Bhattacharjee, Girish Thunga, Ravindra Prabhu Attur, Vijayanarayana Kunhikatta. Development of a multivariable prediction model to assess potential drug-drug interactions in chronic kidney disease patients. *Journal of Applied Pharmaceutical Sciences*. 2024;14(02):109-117. (Q2)
- Vasudev Pai, Chandrashekar Kodangala Subraya , Aswatha Ram Holavana Halli Nanjundaiah, Venkatesh Kamath, Vijayanarayana Kunhikatta. Issues and Challenges in Pharmacovigilance of Herbal Formulations. *Current Drug Safety*. 2024;19(1):19-23. (Q3; IF: 1.5)
- Anmi Jose, Pallavi Kulkarni, Jaya Thilakan, Murali Munisamy, Anvita Gupta Malhotra, Jitendra Singh, Ashok Kumar, Vivek M. Rangnekar, Neha Arya, Mahadev Rao. Integration of pan-omics technologies and three-dimensional in vitro tumor models: an approach toward drug discovery and precision medicine. *Molecular Cancer*. 2024.23(50). (Q1; IF: 37.3)
- Divya Girishbhai Patel, Tejaswini Baral, Shilia Jacob Kurian, Pravachana Malakapogu, Kavitha Saravu, Sonal Sekhar Miraj. Nutritional status in patients with tuberculosis and diabetes mellitus: A comparative observational study. *Journal of Clinical Tuberculosis and Other Mycobacterial Diseases*.2024; 35:100428 (Q3; IF: 2.0)

## Upcoming Events

- 16th Asian Conference on Pharmacoepidemiology (ACPE), October 12-14, 2024, in Tokyo, Japan. <https://www.asianpharmacoepi.org/>
- ISoP Annual meet . October 1-5, 2024, Montreal, Canada. <https://isop2024montreal.org/>
- 82nd FIP World Congress of Pharmacy and Pharmaceutical Sciences, 1-4,September 2024, Cape Town, South Africa. <https://capetown2024.fip.org/>



# SSX2024



## 7th annual conference of the Society for the Study of Xenobiotics (SSX-2024)

was jointly organized by SSX-India and Centre for Pharmacometrics, MCOPS, from 2-3 February 2024, on the 3rd floor, Dr. TMA Pai Hall, Manipal with three parallel pre-conference workshops on 1st February 2024. Society for the Study of Xenobiotics (SSX), India, was established in 2016 as a non-profit association with the mission to develop and augment the knowledge of DMPK/ADMET science to the Indian scientific community. The conference themes were the application of AI/ML to predict ADMET, emerging methods in translational ADME for personalized medicine, challenges and advancements in herbal drug development, and advancements in predicting drug-induced toxicity. There were 19 speakers and 2 keynote speakers from the USA, Japan, and India from Industry, Academics, and various organizations like Gilead, BioIVT, etc.



## 7TH ANNUAL CONFERENCE OF THE SOCIETY FOR THE STUDY OF XENOBIOTICS SSX-2024



**MANIPAL**  
ACADEMY of HIGHER EDUCATION  
*(Institution of Eminence Deemed to be University)*



# CPCON 2024

9th International Conference on Clinical Pharmacy (CPCON 2024), with the theme "Advancing patient-centric medication optimization", organized by Centre for Pharmaceutical Care, Department of Pharmacy Practice, MCOPS at Dr. TMA Pai Auditorium, KMC, Manipal during 6-7 January 2024. The conference featured plenary lectures and symposia by USA, Australia, and India speakers. The conference covered topics such as regulatory overview of clinical trials, patient centricity in healthcare, medical writing in the healthcare industry, AI and automation in academic writing and publications, evolving career direction in pharmacy, digitalization in healthcare supply chain management, medication stewardship program, essential skills for regulatory medical writing. 164 abstracts were presented. The top 10 abstracts received a scholarship.



# Guest talk

Dr. V Kalaiselvan, Senior Principal Scientific Officer at the Indian Pharmacopoeia Commission, Ministry of Health & Family Welfare, Govt. of India, delivered a guest talk on "Regulatory aspects of patient safety: Role of Indian Pharmacopoeia Commission" on 8TH Mach 2024 from 3:30 pm-4:30 pm at Dr. PGR Seminar Hall, MCOPS. He shared his professional experience as a senior principal scientific officer of the materiovigilance program in India and motivated students with vast opportunities for specialist jobs in the sector. Around 60 students of Diploma in Pharmacy, Bachelor of Pharmacy, Master, doctoral, and doctorate levels attended the program. The Centre for Pharmaceutical Care, Dept. of Pharmacy Practice, MCOPS, organized the event on the momentous occasion on 125th Birth Anniversary of our visionary founder Dr. T.M.A. Pai.



# Alumni Column



## Dr. Natasha Nayak

Pharm D (2017-23)  
Associate Pharmacometrician,  
Pfizer, Chennai

Dr. Natasha Nayak is a proud alumna of Manipal College of Pharmaceutical Sciences (MCOPS), having graduated in 2023. She is currently working as an Associate Pharmacometrician at Pfizer, Chennai, India. In her current role she is primarily liaising with the Model Based Meta Analysis group (MBMA) and performing literature searches, data curation, data visualization and quality checks for the disease/therapeutic area of interest. She joined MCOPS in 2017 and graduated in the year 2023. During her PharmD she was involved in the pharmacometrics project under the guidance of Dr. Surulivel Rajan M. Her thesis dissertation was on identifying the Generalizable Pharmacometric Models and her research was mainly focused on population pharmacokinetics.

After the completion of PharmD she joined Pfizer in the month of July 2023. Here she underwent the training essential to perform the required tasks with efficiency. She updated her knowledge on systematically performing the literature searches essential for identifying all the relevant literatures using the multiple data sources available followed by extracting the data from these scientific literatures. Her work also requires her to perform the digitization of the plots, quality control check on the curated datasets. Apart from this she is utilizing the available resources to enhance her knowledge in R programming language and applying them in the day-to-day work.

She feels that PharmD as a course offers an exposure to the various subjects and helps provide one a general idea on what field might spike their interest. Although clinical pharmacist serves as the initial endpoint of interest as a person who newly joins this course one can take diversion and explore the other options it offers. For example research, teaching, corporate jobs such as medical writing, data analysis etc. She feels that apart from focussing on the curriculum one has start developing the other set of skills such as learning a new programming language, handling the databases, reading, understanding and writing the scientific article to name a few. With the extensive support and the guidance of the faculties of the department and making the best possible use of the available resources and learning platforms (eg: coursera) its never too late to start learning new and sharpen your knowledge.

EmailID: natashanayak2021@gmail.com

# Best Wishes



*Batch of 2018-24*



## Pharmacovigilance Programme of India (PvPI)

National Coordination Centre,

Indian Pharmacopoeia Commission, Ghaziabad



The Department of Pharmacy Practice, Manipal College of Pharmaceutical Sciences is an ADR Monitoring Centre (AMC) under Pharmacovigilance Programme of India (PvPI), Indian Pharmacopoeia Commission - National Coordination Centre (NCC), under Ministry of Health & Family Welfare (MoHFW), Government of India.

CONTACT DETAILS

Department of Pharmacy Practice,  
4th Floor MCODES, via New OPD  
block, Kasturba Hospital, Manipal,  
Karnataka, India- 576104

☎ 0820-2922403

✉ [clinpharm@manipal.edu](mailto:clinpharm@manipal.edu)

## EDITORIAL OFFICE

Pharmacy Literacy Club,  
Centre for Public Health Pharmacy,  
Department of Pharmacy Practice,  
4th Floor MCODES, via New OPD block, Kasturba  
Hospital, Manipal, Karnataka, India- 576104

☎ 0820-2922403

✉ [pharmacyliteracyclub@manipal.edu](mailto:pharmacyliteracyclub@manipal.edu)