



# DigiDose

THE QUARTERLY DISPENSE

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# EDITOR'S INK

THE QUARTERLY NEWSLETTER OF THE PHARMACY LITERACY CLUB

JANUARY 2022 | VOLUME 01 | ISSUE 01

The Pharmacy Literacy Club (PLC), Dept. of Pharmacy Practice, MCOPS is a students' initiative to enhance the learning experience and support students' in their academics. It is a student-run club to provide a platform for capacity building, research, and public health pharmacy services. Since its inception, PLC has successfully organised several online as well as offline events. The first event to be organised was ANTIBIOTIKO 2021 aimed to 'Educate Young Health Care Professionals on the Judicious and Safe Use of Antibiotics for Providing Safe and Effective Treatment and Optimizing Patient Care' with Dr. Kavitha Saravu as the chief guest. A variety of competitions were organised as a part of the event, which witnessed very enthusiastic participation from the students.

Following this, two guest talks were held. The first on "Impact of COVID-19 on Pharmacy in the US" by Mr. Deepak Kini an alumnus of MCOPS, Community Pharmacist at Hillcrest Pharmacy and Compounding, Baltimore, Maryland USA. The next was on the topic "Pharmacovigilance: An Industrial Perspective" by Ms. Lekshmi Chandran, Associate manager- safety evaluation and risk management, GlaxoSmithKline Pharmaceuticals in Centre for Pharmaceutical Care (CPC), Dept. of Pharmacy Practice, MCOPS on 9th October 2021.

PLC also observed World Diabetes Day with the theme 'Access to Diabetes Care'. Dr. M. K. Unnikrishnan, Professor, NGSM Institute of Pharmaceutical Sciences, NITTE University, Mangalore, delivered a guest talk on 'A century of insulin: The Grim Reality in Availability, Accessibility, and Affordability'. An e-poster competition was also organized on this occasion.

The Magnum opus was 'World Antimicrobial Awareness Week' in association with the Department of Infectious Diseases, KMC Manipal, Department of Emergency Medicine, KMC Manipal, and Manipal Centre for Infectious Diseases, PSPH. It was a 7-day event with multiple guest talks, various community outreach programmes including pharmacy visits, school visits, and slum visits aimed to increase awareness among the general public about antibiotic resistance. During the valedictory, the guest of honor, Dr. Muralidhar Varma, Chairman, Hospital Infection Control Committee, KMC & KH, Manipal, emphasized the importance of preventive medicine and the opportunities for pharmacists. He also mentioned how every small step counts towards solving the massive problem of the antibiotic crisis.

PLC thanks all our sponsors G Shankar Family Trust, Canara Bank, Rotaract, Radha Medicals, Muscle Infotech, Hotel La Shangrila, and MAC ID, for the year's events. Finally, PLC proudly presents its quarterly newsletter DigiDose – The Quarterly Dispense aiming to educate students and healthcare professionals as well as for documenting various events and programs organized by PLC and the Dept. of Pharmacy Practice.

## MAJOR PROGRAMMES CONDUCTED:

- ANTIBIOTIKO' 21
- WORLD DIABETES DAY
- WORLD ANTIBIOTICS AWARENESS WEEK

## ACTIVITIES & COMPETITIONS

- COMMUNITY OUTREACH PROGRAMMES
- SCHOOL VISITS
- PHARMACY VISITS
- GRAPHICAL E-POSTER PRESENTATION
- QUIZ
- COMIC STRIP DESIGNING
- PATIENT COUNSELING SKIT



Sponsored by: 

# SPOTLIGHT

## OMICRON

World Health Organization (WHO) designated the variant B.1.1.529 as a variant of concern, named Omicron on 26th November 2021. It is not clear whether Omicron is more transmissible or whether infection with Omicron causes more severe disease when compared to other variants. Preliminary evidence suggests that there may be an increased risk of reinfection with Omicron. The effectiveness of vaccines against this variant is also unknown, but vaccines remain critical in reducing disease and death. The presently used PCR tests are effective in detecting infections with Omicron.

Information with respect to infection with Omicron is limited at present.

## FUTURE OF VACCINOLOGY

Currently, there are approximately 269 vaccines in development to treat or prevent infectious diseases, autoimmune disorders, cancers and even Alzheimer's disease. mRNA-based vaccines are in development against HIV, rabies, Zika, and CMV.

New vaccines based on virus-like particles (VLPs), that are artificial viruses comprising of 1 or more copies of viral proteins that can self-assemble into nanoparticles are now being developed for chikungunya,

yellow fever, Zika and malaria. A new type of vaccine against allergic asthma is also under investigation. The vaccine aims to train the immune system against a specific sporozoite protein called circumsporozoite protein (CSP). On 2nd December 2021, a malaria vaccine programme was approved for all endemic countries across Africa.

The development of microneedle patch to administer vaccines is also ongoing. Methods to eliminate the need for immunization booster doses with the help of Vector-Adjuvant-Antigen Standardized Technology (VAAST) are also underway.



# CAREER FRONT



THE MOST IMPORTANT THING ABOUT HAVING GOALS IS HAVING ONE



GEOFFREY F. ABERT

- Fully Funded Commonwealth Shared Scholarships UK – 2022**  
For international students from commonwealth countries to study a 2-year master's degree.  
<https://scholarshipsguider.com/commonwealth-shared-scholarships/>
- Multiple openings - Indegene**  
Indegene works with life science companies, providers, and payers. They help clients leverage big healthcare and technology trends. Available positions can be found in the following link.  
<https://careers.indegene.com/globalOpportunities.aspx>
- Pharmacovigilance Medical Affairs Associate Post – Accenture**  
Accenture is a global professional services company with leading capabilities in digital, cloud, and security. It also offers strategy and consulting interactive technology and operation services.  
<https://www.rasayanika.com/2021/12/27/pharmacovigilance-medical-affairs-associate-post-vacancy-accenture/>
- Junior Clinical Research Associate – ProRelix Research**  
ProRelix Research is a Clinical Research Organization (CRO) that provides services to help pharmaceutical, medical device, biopharmaceutical, and nutraceutical/herbal companies to transform scientific discoveries into new treatments. Apply at [career@prorelixresearch.com](mailto:career@prorelixresearch.com)

# FEATURED ARTICLES

## MALARIA VACCINE

SANJAY MATHEW

Of the many diseases that have ravaged societies, malaria holds a unique place in human history. Malaria was estimated to be responsible for 5% of all human deaths in the twentieth century alone. Even the fall of the great Roman empire has been partially attributed to it. But finally, mankind may have found a way out of the abyss of malaria. A malaria vaccination program for all endemic nations in Africa was authorized on December 2, 2021. This came after a World Health Organization (WHO) recommendation on October 6th that children in moderate-to-high transmission areas be given the RTS, S/AS01e vaccine to prevent infections with *Plasmodium falciparum*, the world's deadliest malaria parasite. These decisions represented the culmination of a decades-long odyssey to create a vaccine against this terrible adversary.



The main logic behind the vaccine is that if the entry of sporozoites into the liver can be prevented, then the rest of the parasites' life cycle is terminated. When an infected female anopheles mosquito bites a person, it injects sporozoites into the bloodstream, which then eventually make their way into the liver. The vaccine is designed to prepare the immune system to fight a specific sporozoite protein termed circumsporozoite protein (CSP). However, one critical problem is that sporozoites only remain in the blood for 30 minutes before entering the liver, giving the body's immune system only a few minutes to react. Joe Cohen, a GSK researcher, had the

brilliant idea of increasing the immunological response by displaying the CSP as a virus-like particle utilizing the hepatitis B virus surface protein (HBsAg) as a scaffold. This molecular deception helped, but it wasn't enough to eradicate the parasite altogether. Experiments were performed with different combinations of adjuvants until finally in 1997 the scientists discovered an adjuvant formulation that was significantly protective against malaria when paired with the CSP-HBsAg construct. Thus ends the three-decade saga to prepare the ultimate malaria vaccine. Will it prove effective? Only time will tell.



## EVUSHELD AND IT'S USE IN THE COVID-19 ERA

LAVANYA SWAMINATHAN

Tixagevimab and Cilgavimab (Evusheld) is a combination of two potent monoclonal antibodies isolated and developed by AstraZeneca through a genetically engineered lab from COVID-19 patients infected with SARS-CoV-2. These are two IM co-administered injections targeting the spike protein of SARS-CoV-2, which impairs the virus attachment and its entry into the human cells, as well as IgG scaffolds which produce a long-lasting effect (~6 months). PROVENT clinical trial (Phase 3 double-blind, placebo-controlled study for pre-exposure prophylaxis of COVID-19 in adults) was conducted to evaluate its potential. 5,000 high-risk individuals who were not infected by COVID-19

were enrolled and monitored for 15 months. The pilot study showed that, those who received an antibody cocktail had a 77% decrease in symptomatic COVID-19 and no serious complications were reported. Recently, they also discovered that this antibody cocktail had the potential to neutralize not only the SARS-CoV-2 virus but its emergent variants including Delta and Omicron strains. In December 2021, the US FDA granted EUA for AstraZeneca's Evusheld for the pre-exposure prophylaxis of COVID-19 in certain people aged >12 years & weighing at least 40 kgs. **Note-** its use is limited to individuals who are not infected and have not been recently exposed to SARS-CoV-2 infection.



**History teaches that outbreaks and pandemics are a fact of life. But when the next pandemic comes, the world must be ready- more ready than it was this time**



DR TEDROS ADHANOM  
GHEBREYESUS

# QUICK REFERENCE

PARTH GANDHI

## Psychiatric Drugs in Hospital Formulary

Drug	Strength and Dosage form	Gen	Side effects										Special populations			Pharmacokinetics		Dosing (mg/dL)		comments
			Sedation	EPS	Anti-Ch	Orthostasis	Wt +	PL	LD	RD	PREG	Lact	A	D	M	E	usual dose	max dose		
<b>Zuclopentixol Decanoate</b>	50 mg/ml, 200 mg/ml depot inj.	1	++	++	Increase	++++	Increase	++	++	caution	C	Min Risk	Tmax: 3-7days	98;20	Liver -	19 days; R:10%, F: rest	10 to 50	50		
<b>Fluphenazine Decanoate IP   WFI</b>	25 mg/mL	1	+	++++	+	++++	+	++++	+	caution	Risk uncertain in-esp. 3T	Avoid	Onset: 24-72h Tmax(im) - 34-65 h	CYP2D6	CYP2D6	14-26 days	>50	100	Dose increased in 12.5 mg increments. Range = 1 to 10 ng/mL, alert level = 15 ng/mL.	
<b>Haloperidol</b>	T - 0.25,0.5,1,5,5,10 mg ; Inj. - 5 mg/mL, 50 mg/mL inj.	1	+	++++	+	++++	+	++++	+	caution - level will increase		NR	BA: 86.1% Onset(iv/im): 30-60min Tmax: 3-6h	CYP1A2 CYP2D6 CYP3A4	18 h R: 30% F: 15%	5 to 20	20			
<b>Chlorpromazine</b>	T - 50,100 mg	1	++++	+++	+++	++++	++	+++	++	caution	C	NR	BA: 32% Tmax(O): 2.8h Tmax(im): 1-4h Tmax(iv): 2-4h	Liver - demethylation	6h; R: 23%	300-800	800	Range: 30 to 300 ng/mL; alert level: 600 ng/mL. Dosing based on response, levels only to check adherence. Most wt. gain amongst FGAs		
<b>Amisulpride</b>	T - 50,100,200,400 mg ; SR T - 200 mg	2	+/-	++	+	+/-	+	+	+	caution	avoid use in severe RD	probably unsafe	25-30; 127-144L		4-5h	500-800	1200			
<b>Aripiprazole</b>	T - 10,15,20,30 mg	2	+	+	+	+	+	+	+	No dose adjustment	C	Excreted	BA: 87% Tmax: 3-5h	CYP2D6, CYP3A4	75h	10 to 30	30			
<b>Paliperidone</b>	PR IM 150 mg ing - 150 mg; ER T - 3 mg	2	+	++	+	++	++	+++	++	mild/moderate - no DA; severe - caution	DA required. Avoid is severe RD	caution	BA: 28%	Liver: CYP3A4, multiple pathways Renal-59%	23h R: 59% F: 11%	3 to 12	12	BA improved when taken with food		
<b>Clozapine</b>	T - 25,50,100,200 mg	2	++++	+	++++	++++	+	+	+	caution in significant LD	B	NR	BA: 50-60% Tmax: 2.5h	CYP2D6, CYP1A2, CYP3A4, CYP2C19	12 R: 50% F: 30%	150-600	900	check plasma level before exceeding 600 mg; monitor; monitor for agranulocytosis and sialorrhoea		
<b>Lurasidone HCl</b>	T - 40,80 mg	2	+	+	+	+	+/-	+/-	+	DA in moderate/severe LD	DA if CrCl < 50 mL/min	Unknown	BA: 9-19% Tmax: 1-3h	CYP3A4	18 R: 9% F: 80%			Take with food		
<b>Olanzapine</b>	T - 2.5,5,7.5,10,20 mg ; Rapid dissolving T - 5 mg ; Mouth melt - 2.5 mg	2	++	++	++	+++	+	+	+	caution	C	NR	Tmax(O): 6h	Liver: Extensive- CYP1A2, CYP3A4, FMO3	30h R: 57% F: 30%	10 to 30	30	Avoid in 1st episode because of wt. gain		
<b>Risperidone</b>	T - 1,2,3,4 mg	2	+	++	+	++	+++	++	++	DA required	DA required	Excreted. NR - esp. when i.m.	BA: 70% Tmax: 1h	Hepatic: Extensive; CYP2D6	3-20h R: 14% F: 14%	2 to 8	16			
<b>Quetiapine Fumarate</b>	T - 25,50,100,200,400 mg ; SR T - 100,200,300 mg	2	++	+	+	++	++	++	+	No dose adjustment	DA required	Excreted	Tmax(O): 1.5h Tmax(SR): 6h	Hepatic: Extensive (CYP3A4)	6-7h R: 73% F: 20%	300-800	800			
<b>Olanzapine pamoate</b>	PR T - 405 mg	2	++	++	++	+++	+	+++	+	caution	No dose adjustment	NR	93; 1000L	Liver: Extensive	30 days R: 57% F: 30%					

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- Databases - UpToDate, IBM Micromedex, and KMC Hospital Formulary

# Hall of Fame

## STUDENTS:

- Ms. Maya T, PharmD-Intern, Dept. of Pharmacy Practice, MCOPS received third prize in Essay Writing competition organized by Saudi Kerala Pharmacists Forum on the occasion of World Pharmacists Day, Saturday 25th September 2021.

- Ms. Nikita Baldewa, Ms. Akanksha, and Ms. Shreya Jain, III Pharm D won first prize, Ms. Lavanya Swaminathan, Ms. Rashmi Shetty, Ms. Fatimazahra Moledina, PharmD (Interns) won second prize, and Ms. Natasha Nayak, V PharmD, won third prize for the e-Poster competition. While Mr. Shrey Seth, V PharmD, won first prize for essay writing competition conducted by the Adverse Drug Reaction Monitoring Centre, Department of Pharmacology, KMC Manipal. The department organized the competition in association with the National Coordination Centre for Pharmacovigilance Programme of India (NCC-PvPI) on the occasion of Pharmacovigilance Week Celebration with the theme "Pharmacovigilance: A Step Towards Patients Safety" from 17 to 23 September 2021.

- Mr. Prashant Chandra, Research Scholar, Dept. of Pharmacy Practice, MCOPS received First Best Oral Presentation Award under the category of Health Economics and Outcomes Research/Epidemiological Studies for the topic entitled Estimating the Cost Burden Associated with Antimicrobial Resistance in a Tertiary Care Hospital in the 2nd International Virtual Conference on Advances in Health Economics and Outcomes Research jointly organized by ISPOR Nitte



(Deemed to be University) Student Chapter and Dept. of Pharmacy Practice, NGSM Institute of Pharmaceutical Sciences Mangaluru, Karnataka, India on 21 and 22 October 2021.

- Ms. Rashmi Shetty, PharmD (Intern), Dept. of Pharmacy Practice, MCOPS won Third prize in case study contest titled "Quest to explore scientific writing skills" conducted by clinical reporting team in Novo Nordisk, Global Business Services, Bangalore on 20th December 2021. The case study contest assessed concise writing, data interpretation, proofreading, graphical illustration, and presentation skills.

## FACULTY:

- Dr. Sonal Sekhar M (Staff coordinator, Pharmacy Literacy Club), Dept. of Pharmacy Practice, Manipal College of Pharmaceutical Sciences, Manipal received an

appreciation award for organizing the community outreach program on the occasion of World Antimicrobial Awareness Week (18-24 November 2021).

- Dr. Sonal Sekhar M, Assistant Professor-Selection Grade, Dept. of Pharmacy Practice, MCOPS received Second-Best Oral Presentation Award under the category of Pharmacovigilance and Patient Safety/Case Reports for the topic entitled Cefepime-Induced Neurotoxicity: A Retrospective Cohort Study in a South-Indian Tertiary Healthcare Facility in the 2nd International Virtual Conference on Advances in Health Economics and Outcomes Research jointly organized by ISPOR Nitte (Deemed to be University) Student Chapter and Dept. of Pharmacy Practice, NGSM Institute of Pharmaceutical Sciences, Mangaluru, Karnataka, India on 21 and 22 October 2021.

## PUBLICATIONS:

( SEPTEMBER – DECEMBER 2021 )

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## UPCOMING EVENTS

- ISPOR 2022 leading global conference for Health Economics and Outcomes Research (HEOR), May 15-18, for discussion and dissemination of the latest trends in healthcare.

For more details, visit

<https://www.ispor.org/conferences-education/conferences/upcoming-conferences/ispor-2022>

- ICPE 2022 from August 24- 28, 2022 Copenhagen Denmark organized by International Society for Pharmacoepidemiology.

For more details, visit

<https://www.pharmacoepi.org/meetings/annual-conference/icpe-2022/>

- ISoP 2022 Annual Meeting 20-23 September 2022 Verona, Italy organized by International Society of Pharmacovigilance

For more details, visit

<https://isoponline.org/annual-meetings/>



# OUTREACH PROGRAMMES

## Community visit

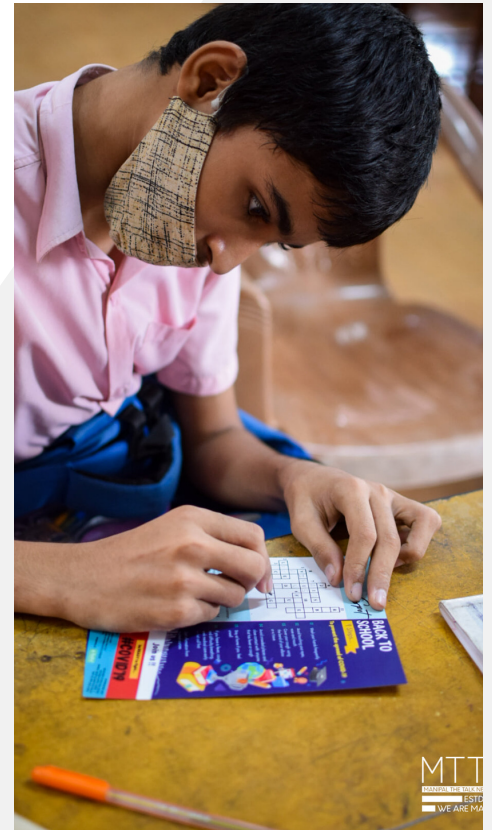


Community outreach visit by PLC in association with MAC ID on the occasion of World Antimicrobial awareness week, where the local people were educated about the importance of proper antimicrobial usage and problems associated with its incorrect use.



# OUTREACH PROGRAMMES

## Pharmacy & School visits



School and pharmacy visits on the occasion of World Antimicrobial Awareness Week. Educational pamphlets were circulated among pharmacists and students to spread awareness about appropriate use of antimicrobials.

# Alumni Column



**Dr. Srujitha Marupuru, PharmD, M.S,  
PhD Candidate**

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“ **My journey through the department of pharmacy practice has nurtured my passion for pharmacy, my thirst for knowledge and self-development. I was able to thrive in an environment that offered supportive faculty who were both knowledgeable and approachable. Being an Alumni of Manipal University is one honor that cannot be described in words alone!** ”

PHARMD BATCH: 2011-2017

Dr. Srujitha Marupuru graduated from Manipal College of Pharmaceutical Sciences, Manipal University, India in the year 2017 with degree in Doctor of Pharmacy. Her prior work experience in India includes pharmacology and clinical trial intern at Tata Cancer Research Memorial Institute (Mumbai) in 2016. She is currently pursuing her PhD in the department of Health and Pharmaceutical Outcomes at the University of Arizona. She completed her master’s in Health and Pharmaceutical Outcomes from the same department in the year 2019. She also completed a Graduate Certificate in Health Law for Health Professionals from the James E. Rogers College of Law, University of Arizona. She has more than 5 years of experience in health economics research as well as clinical pharmacy teaching and mentoring at the university where Ms Marupuru served as a teaching assistant for several pharmacy courses. She currently works part-time as a research assistant at Outcomes Research Group, University of Arizona.

Her research interests include clinical outcomes assessment and patient-level real-world data and analytic tools and prospective observational studies within disease areas like chronic conditions, pain, and oncology. Her desire for knowledge and her standards of excellence are evidenced by the fact that she has achieved many things during her short time in graduate school: she has assisted in writing several research proposals and grants; she currently has 21 publications in leading health and pharmacy journals with overall 115 citations to date with Scopus h-index 3. She has also written one book chapter in Dietary Sugar, Salt and Fat in Human Health in Elsevier (Academic Press). Presenting at a conference is a core part of scientific communication for any researcher and Ms. Marupuru has fulfilled that exceptionally by presenting 35 posters at more than 26 national and international conferences so far since her journey in Manipal.

She has worked on various projects including research grants and served on numerous leadership positions in ISPOR - The Professional Society for Health Economics and Outcomes Research. Ms. Marupuru also makes a valuable contribution to the wider scientific community by serving as a reviewer for several pharmacy related journals. Her scholarly achievements are many, and most recently include the William & Betty Milleson Fink Graduate Student fellowship 2021. She also won several others such as Joseph B. Ryan Memorial Award 2020, the Outstanding Research Award in Pharmaceutical Sciences for consecutive 2020 and 2021, the HPO Academic Excellence award, the Rho Chi Professional Honor Society Academic Excellence award, Best Human Health Research Award at the University of Arizona GPSC student Showcase and the Katheryne B. Willock library research award in both 2019 and 2021. She is also a recipient of the ISPOR distinguished service awardee 2021 for her dedicated involvement and contributions within the student network and community along with a travel grant for attending ISPOR 2022 to present her research. Ms. Marupuru has also been successful in obtaining two summer internship opportunities at leading pharmaceutical companies; Regeneron Pharmaceuticals and Merck & co.

# Pharmacovigilance Programme of India(PvPI)



National Coordination Centre,  
Indian Pharmacopoeia Commission, Ghaziabad



The Department of Pharmacy Practice, Manipal College of Pharmaceutical Sciences has been approved as 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.




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