PharmaNexus 2025

Newsletter 2025

Department of Pharmacology ,GMC ,Kottayam

VOLUME 3

PHARMANEXUS 2025

Professor and Head
Dr Sujatha MB
Associate Professors
Dr S P Dhanya
Dr Scaria Thomas P
Assistant Professors
Dr Neethu Soman
Dr Hyma V
Dr Jiyo Chacko
Dr Sreelakshmi Venugopal
Lecturer
Dr Anila E Mathew
Dr Athira MD
Senior Resident
Dr Neethu Mohan

Junior Residents
Dr Gnanaprakasam D
Dr Eva John
Dr Sruthi C L
Dr Abey Abraham Joy
Dr Asif Haris
Dr Sherin Koloth
Dr Riyas Mohammed
Dr Gopika G L
Lab Technician
Mrs Anazia Alavudeen
Junior Lab Assistant
Mr Vipin KunjanPillai
Cleaners
Mrs Mini K S
Mrs Philomina Kubelio

PHARMANEXUS 2025

Contents

" WHERE CHEMISTRY MEETS COLOUR"

Cover Page Design

This striking image in the coverpage of the newsletter captures the vivid interface between the aqueous Erichrome Black Tea (EBT) layer and the organic chloroform phase during a colorimetric experiment, where chemistry reveals its hidden beauty. At this delicate boundary of two immiscible worlds, metal ions interact with EBT to form complexes while extraction into the chloroform layer produces the intense crimson—amber hues seen in the frame. The glowing textures, bubbling microstructures, and fiery gradients illustrate the dynamic processes of diffusion, phase separation, and molecular exchange occurring at the interface. What appears almost like a molten landscape or a distant cosmic horizon is in fact a moment of analytical chemistry in action—where invisible molecular interactions are transformed into measurable colour, showcasing both the scientific precision and unexpected artistry of the laboratory

Dr Asif Haris,JR2

MESSAGE FROM THE PRINCIPAL

Dear colleagues,

I am very pleased to learn that the Department of Pharmacology is bringing out the new edition of PHARMANEXUS. I am amazed at the diversity of the menu of this beautiful creation. Apart from the articles related to pharmacology and medical education, creative literary works from the faculty and residents make it unique. The punchy titles make the reader curious. The readability of the contents makes it a reading feast at a single stretch.

Documenting the official and academic work on one side and expression of creative thoughts, emotions, and perceptions on the other make this endeavor a pride of the Pharmacology Department and an envy for other departments. Definitely a model to be emulated.

I hope this newsletter will come out in regular intervals with enhanced quality and ultimately evolve as an indexed journal in the near future.

Hearty congratulations to the team under the head of the department, Dr. Sujatha MB.

Best wishes.

DR VARGJHESE P PUNNOOSE
PRINCIPAL

FROM THE EDITOR

It gives me immense pleasure and pride to be the editor of Pharmanexus 2025, the Department of Pharmacology, GMC Kottayam, newsletter, volume 3. Dr. Sujatha M.B., our head of the department, has been a steadfast support, and her encouragement has been crucial in conceiving this newsletter. The team spirit and support from all department members, faculty, and residents alike is the main reason why this newsletter has materialized.

The then principal, Dr. Sankar S., released the initial volume, Voyage 2023, and encouraged and appreciated documentation, an essential component of best practices. Last year Dr. Varghese P. Punnoose, our principal, released the second volume, Reminiscence 2024. The event was graced by Dr. Tigy Thomas Jacob, Professor and Head of Orthopaedics and General Secretary of the Alumni Association, as the newsletter release coincided with the inauguration of the demonstration hall renovated by the 1998 alumni, for which Dr. Hyma V., Assistant Professor in our department, played a crucial role in coordinating the renovations.

Dr. Jiyo Chacko suggested the name Pharmanexus 2025 for the newsletter, which translates to "the central connection point of pharmacology." He proposed that Pharmanexus would be a hub connecting education, research, clinical practice, and innovation. When the call for articles was put up in the WhatsApp group, the first article for the section on creativity was sent by Dr. Eva John, the exam-going resident, and the first formal article was submitted by Dr. Scaria Thomas P., our Professor (CAP).

As we reflect on a year defined by both academic rigor and creative exploration, this volume showcases the diverse expertise of our faculty and residents. We celebrate our collective milestones in Activities and Achievements 2025. This section is a testament to the hard work, breakthroughs, and collaborative spirit that define our department. From the educational corner spanning pharmacology and medical education to the expressive depths of the literary works, we invite you for a beautiful sojourn with us.

In our educational corner, we tackle the pressing issues of the present and priceless discoveries of the past. We begin with a sobering look at the recent cough syrup tragedy in India, a reminder of the critical importance of pharmacovigilance and regulatory stringency. We revisit the monumental discovery of insulin and the enduring clinical utility of paracetamol. Our contributors also discuss the "Celebrity Halo Effect" in aesthetic pharmacology to the gut microbiome—our "hidden internal pharmacologist." Whether exploring the biochemistry of love or the realities of creatine supplementation, the benefits of vitamin D, or the silent pandemic of antimicrobial resistance, this section underscores that pharmacology is as much about human experience as it is about molecular binding.

Our department is academically oriented, and under the coordination of Dr. Neethu Soman for the MBBS students, we put our heart and soul into teaching. The landscape of medical education is shifting, and we remain at the forefront of this evolution. This "Science and Sighs" of the Viva Voce explores how we can refine assessment to be more objective, empathetic, and effective in a competency-based curriculum. Our Literary and Lifestyle Corners bring out the creative fingertips and minds as drugs find their voices—from the "restraints" of a beta-blocker to reflections and the "quiet walk" of atropine to life-changing pharmacogenomics, these creative reflections, alongside poignant book reviews and personal letters to the discipline, mesmerize us as we encounter the troughs and peaks.

Furthermore, we recognize that health is a holistic pursuit. Our feature on the "Magic of Zumba" encourages us to apply the principles of movement and wellness to our own lives, ensuring that as we care for others, we do not neglect our own vitality. Finally, to sharpen your wits after such a deep dive, don't miss our Brain Teasers, designed to challenge your pharmacological intuitions

We hope this newsletter serves as both a resource and an inspiration. Thank you to every contributor for sharing your insights, your stories, and your passion. I have a personal disclaimer that with the advent of artificial intelligence, which has so deeply insinuated itself into our lives, this newsletter acknowledges its wide use for content refining and image generation and editing.

Happy reading! Until next year if I am here!

Dhanya SP

EDITOR

Section 1- Activities and Achievements 2025

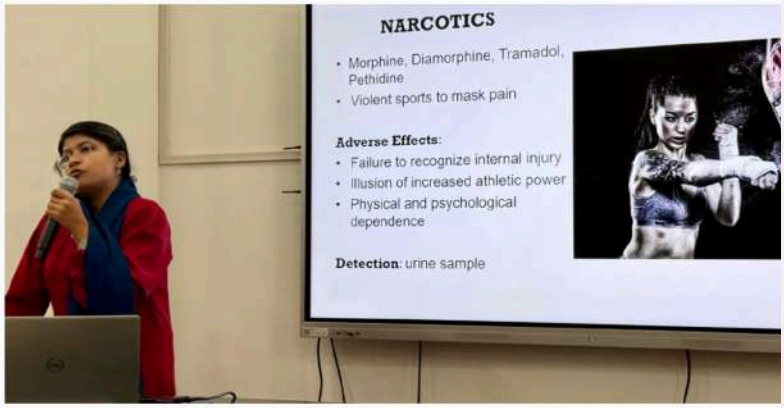
WORKSHOP ON BASIC DATA ENTRY IN EXCEL

A workshop titled" Make your data work for You"-A workshop on Basic Data Entry in MS Excel was conducted on 31.01.2025 with Dr Jiyo Chacko, Assistant Professor as the resource person,
It was attended by 11 Faculty and residents in the department. It was an enlightening and must attend session to all researchers and residents who plan data entry in MS Excel

PG SYMPOSIUM in connection with RECREATIONAL SPORTS and FITNESS DAY

On February 2022, in connection with recreational sports and fitness day a post graduate symposium was conducted for 2023 MBBS batch students moderated by Dr Scaria Thomas P, Associate Professor. The residents discussed the pathogenesis, pharmacological approaches and newer approaches of the silent killer obesity followed by Drug abuse in sports. The session concluded by message from the moderator regarding the importance of lifestyle behavioural changes to remain healthy.

PG SYMPOSIUM in connection with RECREATIONAL SPORTS and FITNESS DAY



RESILIENCE, RIDDLES, AND REALITIES
INTERNATIONAL WOMEN'S DAY

In connection with the International Women's Day celebration, Dr Sujatha M B, Professor and Head delivered message on the theme Accelerate Action, Dr Sherin Koloth, JR 2 talked about her personal experiences as she stepped in the field of sports after coming to Kerala and Dr Dhanya, Associate Professor conducted a Riddle based competition

INAUGURATION OF DEMONSTRATION HALL RENOVATED BY 1998 ALUMNI

കോട്ടയം മെഡിക്കൽ കോളജ് ഫാർമക്കോളജി ഡിപ്പാർട്മെന്റിന്റെ ന്യൂസ് ലെറ്റർ രണ്ടാം പതിപ്പ് 'റമിനിസെ
സ് -2024' ന്റെ പ്രകാശനം പ്രിൻസിപ്പൽ ഡോ. വർഗീസ് പി.പുന്നൂസ് നിർവഹിക്കുന്നു.

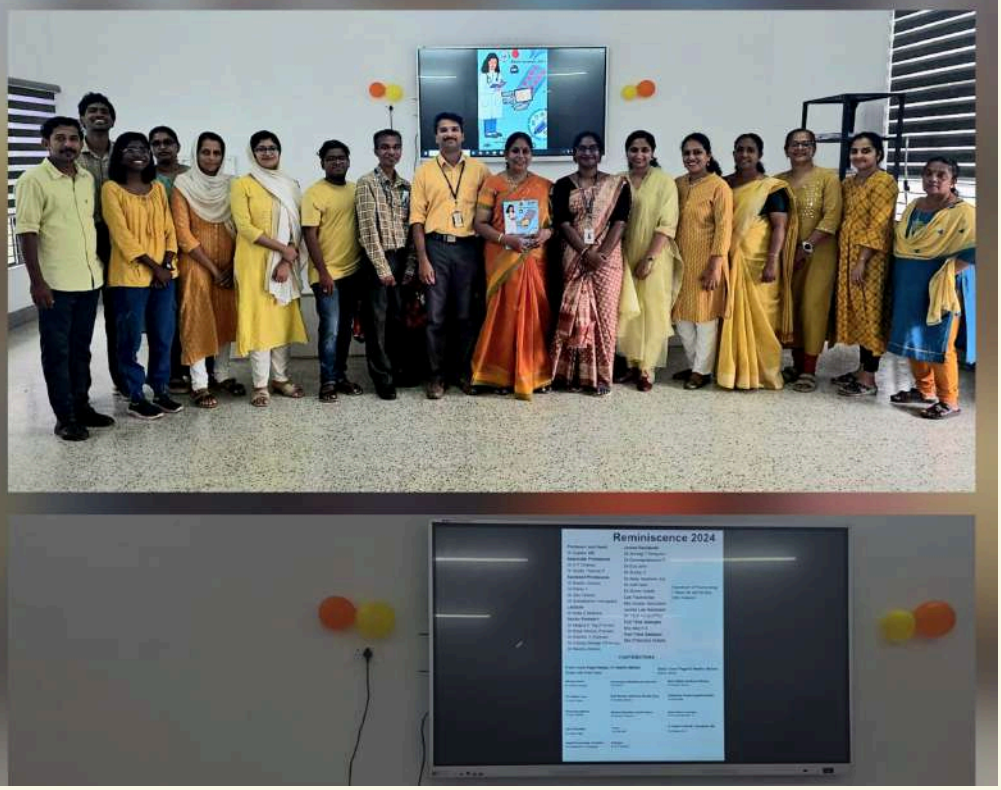
നവീകരിച്ച ഫാർമക്കോളജി ലക്ചർ ഹാൾ ഉദ്ഘാടനം

ഗാന്ധിനഗർ • കോട്ടയം ഗവ. മെഡിക്കൽ കോളജിൽ നവീകരിച്ച ഫാർമക്കോളജി ലക്ചർ ഹാളിന്റെ ഉദ്ഘാടനം പ്രിൻസിപ്പൽ ഡോ. വർഗീസ് പി.പുന്നൂസ് നിർവഹിച്ചു.
കോട്ടയം മെഡിക്കൽ കോളജ് 1998 ബാച്ച് സംഭാവന ചെയ്ത 6 ലക്ഷത്തോളം രൂപ വിനിയോഗിച്ചാണ് ഫാർമക്കോളജി ലക്ചർ ഹാൾ നവീകരിച്ചത്. ഫാർമക്കോളജി വിഭാഗം മേധാവി ഡോ. എം.ബി.സുജാത, കോട്ടയം മെഡിക്കൽ കോളജ് അലമ്നൈ അസോസിയേഷൻ സെക്രട്ടറി ഡോ. ടിജി തോമസ് ജേക്കബ്, 1998 ബാച്ച് പ്രതിനിധികളായ ഡോ. എസ്.പി.ധന്യ, ഡോ. ജോമിൻ ജോസ്, ഡോ. ലീന എ.ജോസഫ്, ഡോ. എ. കെ.നസ്നീൻ, ഡോ. ആർ.ശ്രീനന്ത് എന്നിവർ പ്രസംഗിച്ചു.
ചടങ്ങിൽ ഫാർമക്കോളജി ഡിപ്പാർട്മെന്റിന്റെ ന്യൂസ് ലെറ്റർ രണ്ടാം പതിപ്പ് 'റെമിനിസൻസ് - 2024' ന്റെ പ്രകാശനവും നടന്നു.

The demonstration Hall of Pharmacology department was renovated by the Alumni association sponsored by the 1998 alumni as a part of the Diamond Jubilee Celebrations

NEWSLETTER VOLUME 2 RELEASE: REMINISCENCE 2024


കോട്ടയം മെഡിക്കൽ കോളജ് ഫാർമക്കോളജി ഡിപ്പാർട്മെന്റിന്റെ ന്യൂസ് ലെറ്റർ രണ്ടാം പതിപ്പ് 'റമിനിസെൻസ് -2024' ന്റെ പ്രകാശനം പ്രിൻസിപ്പൽ ഡോ. വർഗീസ് പി.പുന്നൂസ് നിർവഹിക്കുന്നു.



National Pharmacology Day Celebrations

DEPARTMENT OF PHARMACOLOGY, GMC, KOTTAYAM

National Pharmacology Day 2025

Every year, 17 August is celebrated as the National Pharmacology Day to commemorate the birthday of Dr Ram Nath Chopra, The Father of Indian Pharmacology. National Pharmacology Day serves as a reminder to the Pharmacology fraternity of their various roles from drug development, education, research, to ensuring safety and efficacy of medicines.

SEMINAR

New Drugs and Clinical Trials Rules, 2019

DR ABEY ABRAHAM JOY

MEDLOOM: WEAVING BREAKTHROUGHS INTO MEDICAL CARE

Registration

Please scan the below given QR code which will take you to a google form which can be filled for registration

For Queries, Contact
Dr Neethu Soman
Dr Sreelakshmi Venugopal

9446450150, 9645991541
pharmacologykottayam@gmail.com
Golmedex Hall, 3rd Floor, C2 Block

OUR PATRON

Dr Varghese P Punnoose
Principal

Critical Appraisal Competition for PGs will be in a Quiz format. Maximum of 2 teams from each college. 2 PGs per team. If there are more than 5 teams, there will be a prelims.
Cash prize for winners
1st prize: ₹ 3000
2nd prize: ₹ 2000
3rd prize: ₹ 1000
Participation certificate will be awarded to all

MEDLOOM: WEAVING BREAKTHROUGHS INTO MEDICAL CARE

National CME
organised by
Department of Pharmacology, Government Medical College, Kottayam

August 26, 2025
GOLMEDEX HALL,
C 2 BLOCK

Dear colleagues and residents,

We, the Department of Pharmacology, GMC, Kottayam, welcome you to our National CME- "MEDLOOM: Weaving Breakthroughs in Medical Care" on 26th August 2025. The topics selected are very relevant in Clinical practice and Academics. There is a lot of curiosity regarding these topics and we have brought together the most appropriate faculty for this academic feast. In the afternoon session, we have a competition for the brilliant minds in Pharmacology based on "Critical Appraisal of Journal Articles". Attractive cash prizes await the first, second and third prize winners.

Hoping to see you all for the CME,

Dr Sujatha M B,
Professor and Head
Organising Chairperson

Dr Neethu Soman
Assistant Professor
Organising Secretary

PROGRAMME SCHEDULE

8.30 - 9.15: **Registration**

9.15 - 9.45: **A Look at CAR T cell therapy**
Dr Jiyo Chacko
Assistant Professor, Pharmacology
Government Medical College
Kottayam

9.45 - 10.30: **Biosimilars**
Dr Ruby Raphael
Manager
Department of Clinical Development and Medical Affairs
Hetero Drugs, Hyderabad

10.30 - 11.00: **Inaugural Function**

11.00 - 11.15: **Tea Break**

11.15 - 11.50: **The Race against Obesity**
Dr Scaria Thomas P
Associate Professor,Pharmacology
Government Medical College
Kottayam

11.50- 12.25: **Monoclonal Antibodies in Rheumatology Practice**
Dr Harikrishnan G
Head of Department, Rheumatology
Government Medical College
Kottayam

12.25- 1.00: **Invasive Fungal Infections: Therapeutic challenges**
Dr Aravind R
Associate Professor and Head
Department of Infectious DIseases
Government Medical College
Thiruvananthapuram

1.00 - 1.45: **Lunch**

1.45 - 3.45: **Critical Appraisal Competition**
Dr Dhanya SP
Professor (CAP), Pharmacology

3.45 - 4.00: **Valedictory Function**

OUR RESOURCE PERSONS

Dr Harikrishnan R

Dr Ruby Raphael

Dr Jiyo Chacko

Dr Aravind R

Dr Dhanya SP

Dr Scaria Thomas P

Our National CME : Medloom : Weaving Breakthroughs into Medical Care was conducted on August 26 2025.

MEDLOOM: WEAVING BREAKTHROUGHS INTO MEDICAL CARE

MEDLOOM: WEAVING BREAKTHROUGHS INTO MEDICAL CARE

MEDLOOM: WEAVING BREAKTHROUGHS INTO MEDICAL CARE

Medloom was intended to bring together the diverse strands of knowledge and compassion. Medloom logo was the mastermind of the organizing secretary, Dr. Neethu Soman.The logo projects a heart shape suttly integrated with the letter M and that reflects compassion and healing. The capsule with upper half in red that symbolizes vitality and lower half in yellow symbolizes hope

MEDLOOM: WEAVING BREAKTHROUGHS INTO MEDICAL CARE
CME REPORT

The National CME – “MEDLOOM- Weaving Breakthroughs into Medical Care” was organized by the Department of Pharmacology, GMC Kottayam and was conducted on 26th August 2025 at Golmedex Hall, GMC, Kottayam. A total of 118 delegates attended the CME of which 113 were participants and 7 were speakers. Of the 7 speakers, 2 were external faculty and 5 internal faculty. There were registrations from all over Kerala.

The workshop started at 9.15 am with a prayer. The first session was by Dr. Jiyo Chacko, Assisitant Professor Pharmacology, GMC Kottayam on ‘A look at CAR T Cell therapy’. The next session was on ‘Biosimilars’ by Dr. Ruby Raphael, Manager, Department of Clinical Development and Medical Affairs, Hetero Drugs, Hyderabad. The inaugural function started with Welcome speech by the Organizing Chairperson Dr. Sujatha M.B. Professor and Head Pharmacology. This was followed by lamp lighting and inaugural address by Vice-Principal Dr. Ajith Kumar K. The vote of thanks was proposed by Dr. Neethu Soman, Organizing Secretary. After the tea break there were 3 successive talks on ‘The Race Against Obesity’ by Dr. Scaria Thomas P, Associate Professor Pharmacology, GMC Kottayam; ‘Monoclonal Antibodies in Rheumatology Practice’ by Dr. Harikrishnan G, Head of Department of Rheumatology, GMC Kottayam; ‘Invasive Fungal Infection: Therapeutic Challenges’ by Dr. Aravind R, Head of Department of Infectious Disease, Government Medical College, Trivandrum. As a token of appreciation and gratitude, memento and certificate were handed over to the speakers at the end of each session.

The afternoon session featured a Quiz competition on ‘Critical Appraisal of a Journal’ conducted by Dr. SP Dhanya, Professor (CAP) Pharmacology, GMC Kottayam and Dr. Hyma V, Assistant Professor Pharmacology, GMC Kottayam. A total of 7 teams participated: 2 teams from GTDMC Alappuzha, 2 teams from Pharmacology, GMC Kottayam, 2 teams from Community Medicine, GMC Kottayam and 1 team from GMC Trissur. The winners of the Quiz were awarded certificates, medals and cash prize as a token of appreciation. The CME ended at 5.00 pm with National Anthem.
This CME was accredited with 2 hours by KSMC C6/15552/2025/MC/CME dated 18/08/2025.

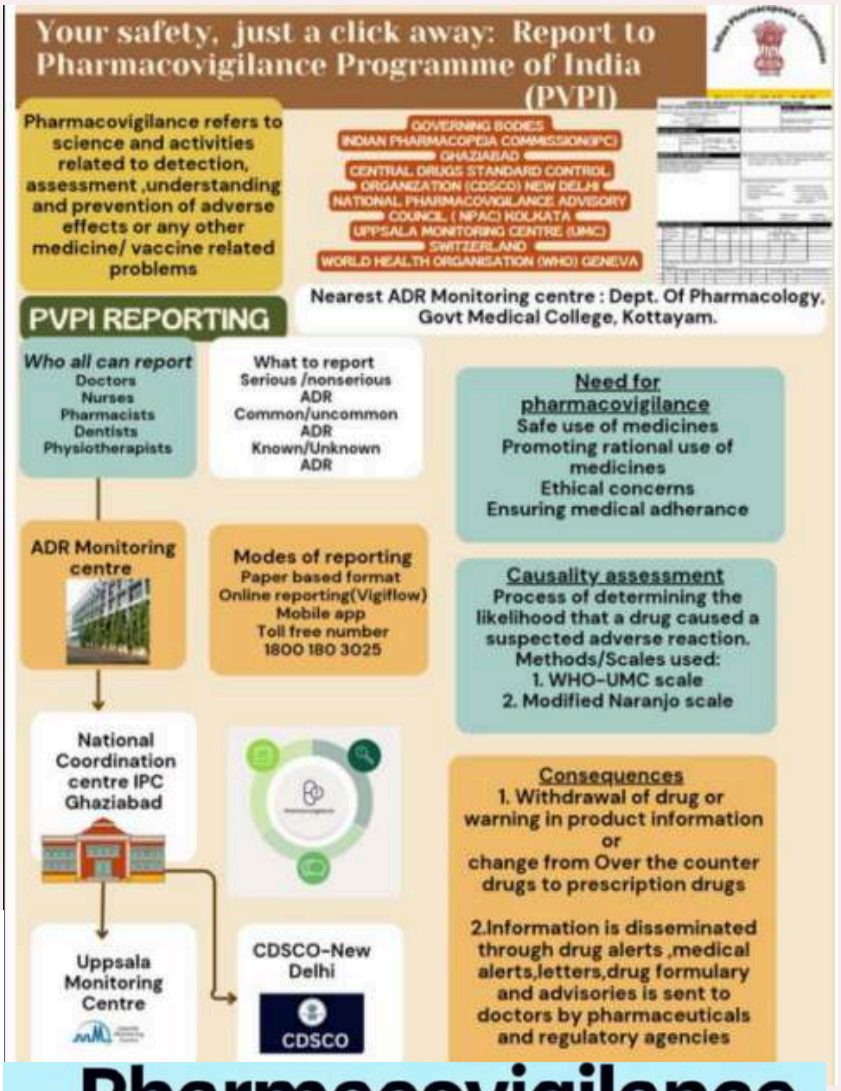
ONAM PONNONAM NALLONAM


Staff Welfare Onam
01 September 2025 2:04 pm


Onam


Wishing you
a very happy Onam
HAPPY
Onam

Pharmacovigilance Awareness Week 2025



Pharmacovigilance Awareness Week 2025

Poster Designing

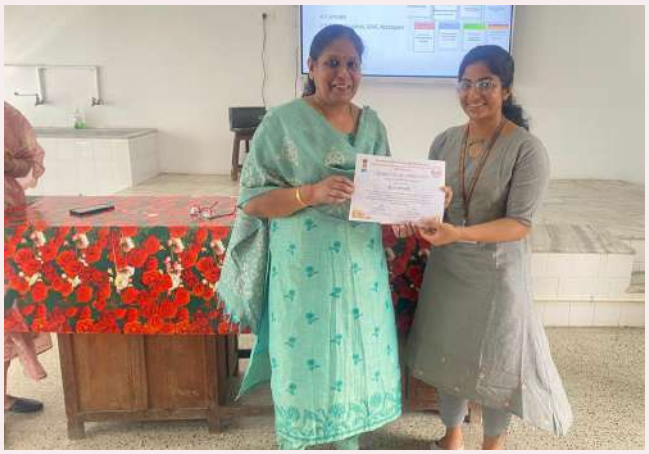
1st- Nandhana Girish 2023 MBBS

2nd -Anjana TS 2023 MBBS

3rd- Navaneeth NP 2023 BDS

Concept Map

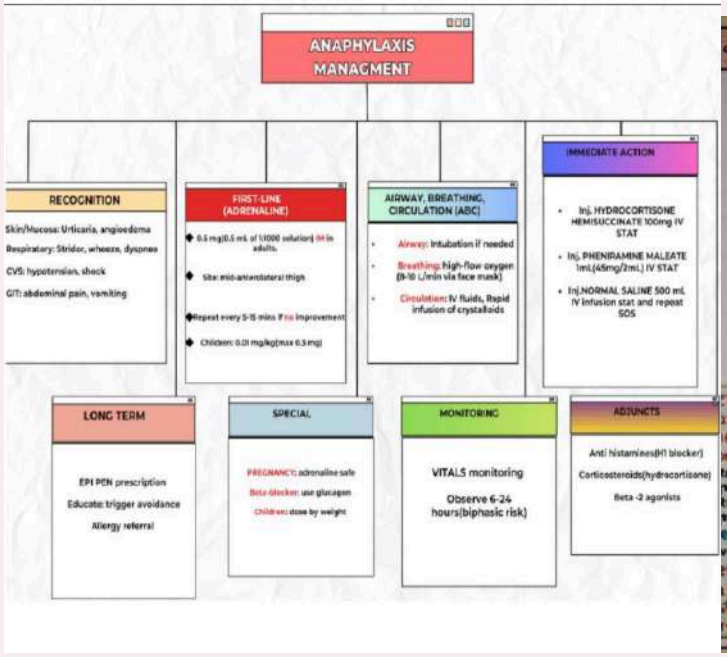
1st- Nandhana Girish 2023 MBBS

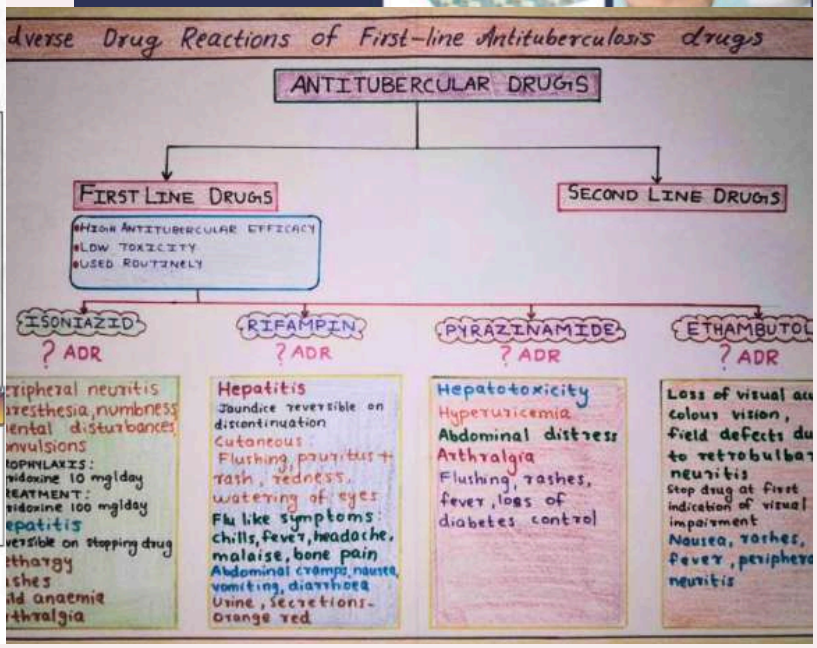


2nd-K S Srinath 2023 MBBS

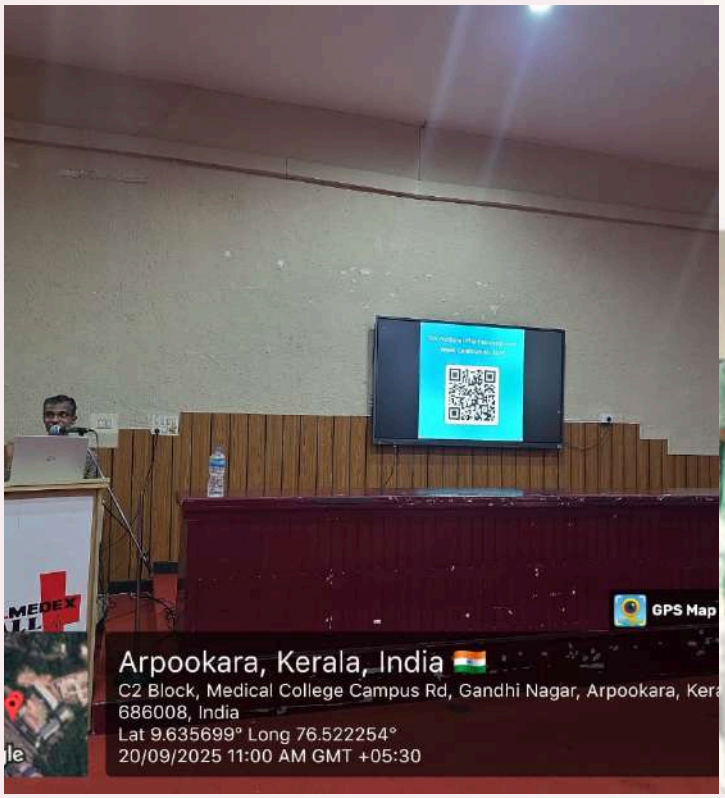
3rd- Merin Treesa Roy 2023 MBBS

Pharmacovigilance Awareness Week 2025-
Concept Map Designing





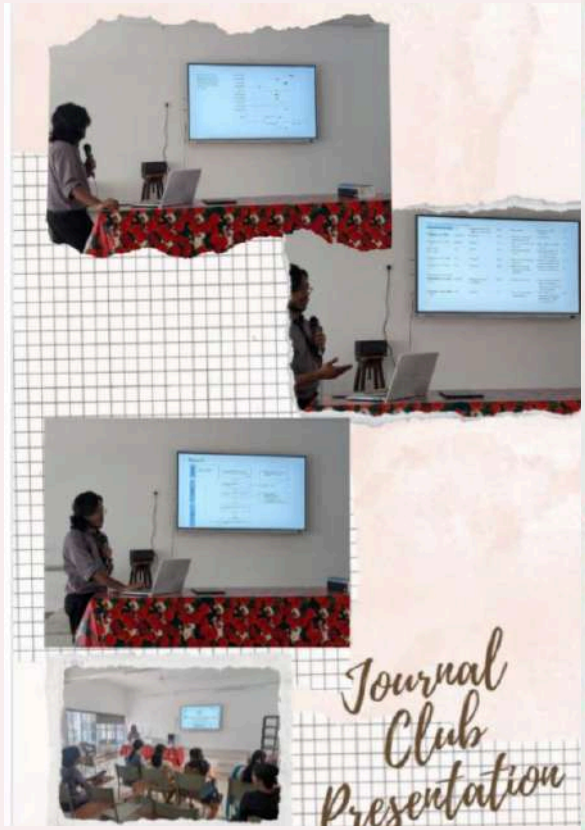
Pharmacovigilance Awareness Week 2025-Quiz



Quiz Competition

Pharmacovigilance Awareness Week 2025-
Integrared Vigilance- PG Symposium

Pharmacovigilance Awareness Week 2025-



Pharmacovigilance Awareness Week 2025-Walkathon

ANNUAL REPORT OF PHARMACOVIGILANCE -2025

The Pharmacology Department of Government Medical College, Kottayam has been enrolledas an AMC (ADR Monitoring Centre) for PvPI (Pharma covigilance Programme of India) since 2012. Since then it has been contributing for the cause of patient safety by submitting Individual Case Safety Reports (ICSRs) to PvPI through vigiflow. Since then there has been tremendous progress in building the culture of reporting ADRs among the healthcare professionals in and around Kottayam District. Our AMC has received a total of 430 ICSRs from its different stakeholders in and around Kottayam District from 1 st January 2025 to 31 st December 2025 which has been submitted to PvPI for further evaluation. Currently there are around 1150 AMCs are enrolled under PvPI across India. The details of AMCs are given on the website of IPC i.e. www.ipc.gov.in and can be assessed through the link https://ipc.gov.in/images/pvpi/1150-AMC-Details.pdf

Healthcare professionals can submit the “Suspected Adverse Drug Reaction Reporting Form” available in the following link https://www.ipc.gov.in/images/ADR_Reporting_Form_1.4_Version.pdf

Similarly consumers/patient can submit the “Medicines Side Effect Reporting Form (For Consumers)” available in the following link https://www.ipc.gov.in/images/pdf/File338.pdf

While submitting the above forms to the AMCs, please ensure to fill in atleast the mandatory fields which are patient initials, age at onset of reaction, reaction term(s), date of onset of reaction, suspected medication(s) & reporter information.

The filled forms may be sent as an email or whattsapp message to the AMC at GMC Kottayam, details of which as below:

- E-mail ID of AMC located at GMC Kottayam : mckpharmacadr@gmail.com
- Whattsapp number of Deputy Coordinator GMC Kottayam: 7558970809

Toll free helpline number (1800-180-3024) can also be used to directly report an ADR (All Working Days 9:00 AM to 5:30PM).

The AMC organised the following events in connection with the 5 th National Pharmacovigilance Week 2025

S. No	Date of Training (DD/MM/YYYY)	Objective/ Title of the Training	Participants Type: (Doctors/Pharmacists/Nurses	No. of Participants	Type of Training (CME/ALT/Semin
1	7 Days (10th, 11th, 12th, 15th ,16th 17th and 18th September 2025)	Assessment of Filling an ADR Reporting form & Causality assessment of an ADR using two tools namely WHO causality scale and Naranjo	· MBBS students of Govt. Medical College, Kottayam: 172	Total 172	Others (Senistization and Assessment)
2	22nd September 2(	E-Poster Designing Competition on the theme “Your Safety, Just a Click away: Report to PvPI”	· MBBS Students of Govt. Medical College, Kottayam: 328 · BDS Students of Govt. Dental College, Kottayam: 38 · B.Sc Nursing Students of Govt. College of Nursing, Kottayam: 82	Total 448	Others (Sensitization)

S. No	Date of Training (DD/MM/YYYY)	Objective/ Title of the Training	Participants Type: (Doctors/Pharmacists/Nurses/ Other HCPs)	No. of Participants	Type of Training (CME/ALT/Seminar/ Others)
3	22nd September 2025	Concept map making competition was planned on four topics : Management of anaphylaxis, Adverse drug reactions of corticosteroids, Adverse drug reactions of first line Anti-tuberculosis drugs and Medication concept map for the drug Telmisartan	· MBBS Students of Govt. Medical College, Kottayam: 328 · BDS Students of Govt. Dental College, Kottayam: 38 · B.Sc Nursing Students of Govt. College of Nursing, Kottayam: 82	Total 448	Others (Sensitization)
4	20th September 2025	Quiz Competition Theme: “Alert & Aware: The Vigilance e-Quiz challenge”	· B.Sc Nursing Students of Govt. College of Nursing, Kottayam: 82	Total 82	Others (Sensitization)
5	20th September 2025	The symposium titled “Integrated Vigilance: A Symposium on Drug, Blood, Vaccine, and Device Safety”	· B.Sc Nursing Students of Govt. College of Nursing, Kottayam: 82	Total 82	Others (Sensitization)
6	22nd September 2025	Journal Club Presentation Theme: “Aging Gracefully, Medicating Safely: Evidence Insights”	· Doctors: 15	Total 15	Others (Sensitization)

S. No	Date of Training (DD/MM/YYYY)	Objective/ Title of the Training	Participants Type: (Doctors/Pharmacists/Nurses/ Other HCPs)	No. of Participants	Type of Training (CME/ALT/Seminar/ Others)
7	20th September 2025	A walkathon was arranged by involving the faculties and staff of pharmacology department of GMC, Kottayam along with the undergraduate students of Govt. Nursing college, Kottayam as part of community outreach to widely sensitize	· Doctors: 15 · B.Sc Nursing Students of Govt. College of Nursing, Kottayam: 82	Total 97	Others (Sensitization)
8	20th September 2025	As part of the Community outreach, the general public visiting our hospital were sensitised on developing the culture to report ADRs as per the PvPI and the QR code as well as the details of the toll free number of PvPI for reporting ADRs was shared.	· Doctors: 15 · B.Sc Nursing Students of Govt. College of Nursing, Kottayam: 82	Total 97	Others (Sensitization)
9	20th September 2025	Designing and pasting Posters on ADR reporting at Nursing Stations of wards	· MBBS students: 10 · Nursing staff of Govt. Medical College, Kottayam: 60	Total 70	Others (Sensitization)

Report prepared by Dr Jiyo Chacko, Deputy Coordinator,
ADR Monitoing Centre, GMC Kottayam

WORLD ANTIMICROBIAL AWARENESS WEEK 2025

World Antimicrobial Awareness Week 2025

Department of Pharmacology, GMC Kottayam

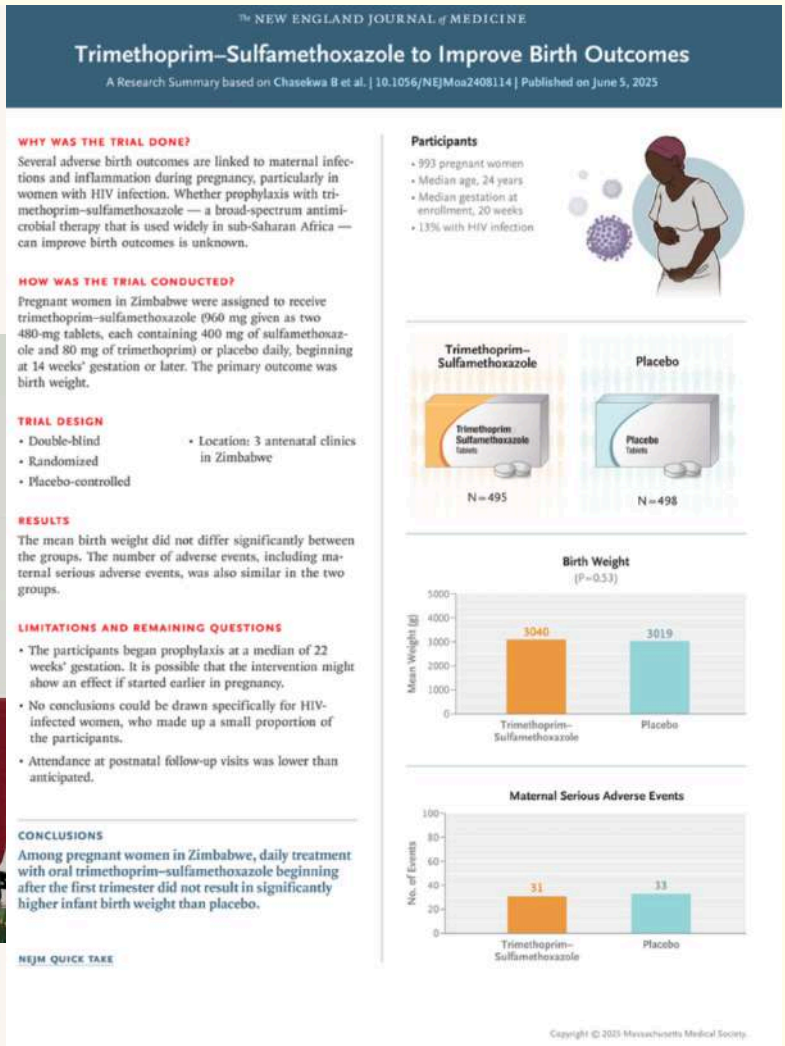
18-24 November 2025

PG Journal Club Presentation

Chasekva B, Munhanzi F, Madhuyu L, Mbewe G, Mabika V,Chidhangiro D, et al. A Trial of Trimethoprim–Sulfamethoxazole in Pregnancy to Improve Birth Outcomes.N Engl J Med 2025;392:2125-34. DOI: 10.1056/NEJMoa2408114

Date: 18.11.2025 **Time :1.00 PM** **Venue: Demonstration Hall**

#ACT NOW: PROTECT OUR PRESENT, SECURE OUR FUTURE#



The NEW ENGLAND JOURNAL of MEDICINE

Trimethoprim–Sulfamethoxazole to Improve Birth Outcomes

A Research Summary based on Chasekwa B et al. | 10.1056/NEJMoa2408114 | Published on June 5, 2025

WHY WAS THE TRIAL DONE?

Several adverse birth outcomes are linked to maternal infections and inflammation during pregnancy, particularly in women with HIV infection. Whether prophylaxis with trimethoprim–sulfamethoxazole — a broad-spectrum antimicrobial therapy that is used widely in sub-Saharan Africa — can improve birth outcomes is unknown.

HOW WAS THE TRIAL CONDUCTED?

Pregnant women in Zimbabwe were assigned to receive trimethoprim–sulfamethoxazole (960 mg given as two 480-mg tablets, each containing 400 mg of sulfamethoxazole and 80 mg of trimethoprim) or placebo daily, beginning at 14 weeks' gestation or later. The primary outcome was birth weight.

TRIAL DESIGN

- Double-blind
- Randomized
- Placebo-controlled
- Location: 3 antenatal clinics in Zimbabwe

RESULTS

The mean birth weight did not differ significantly between the groups. The number of adverse events, including maternal serious adverse events, was also similar in the two groups.

LIMITATIONS AND REMAINING QUESTIONS

- The participants began prophylaxis at a median of 22 weeks' gestation. It is possible that the intervention might show an effect if started earlier in pregnancy.
- No conclusions could be drawn specifically for HIV-infected women, who made up a small proportion of the participants.
- Attendance at postnatal follow-up visits was lower than anticipated.

CONCLUSIONS

Among pregnant women in Zimbabwe, daily treatment with oral trimethoprim–sulfamethoxazole beginning after the first trimester did not result in significantly higher infant birth weight than placebo.

NEJM QUICK TAKE

Participants

- 993 pregnant women
- Median age, 24 years
- Median gestation at enrollment, 20 weeks
- 13% with HIV infection

Trimethoprim–Sulfamethoxazole — N=495

Placebo — N=498

Birth Weight (P=0.53)

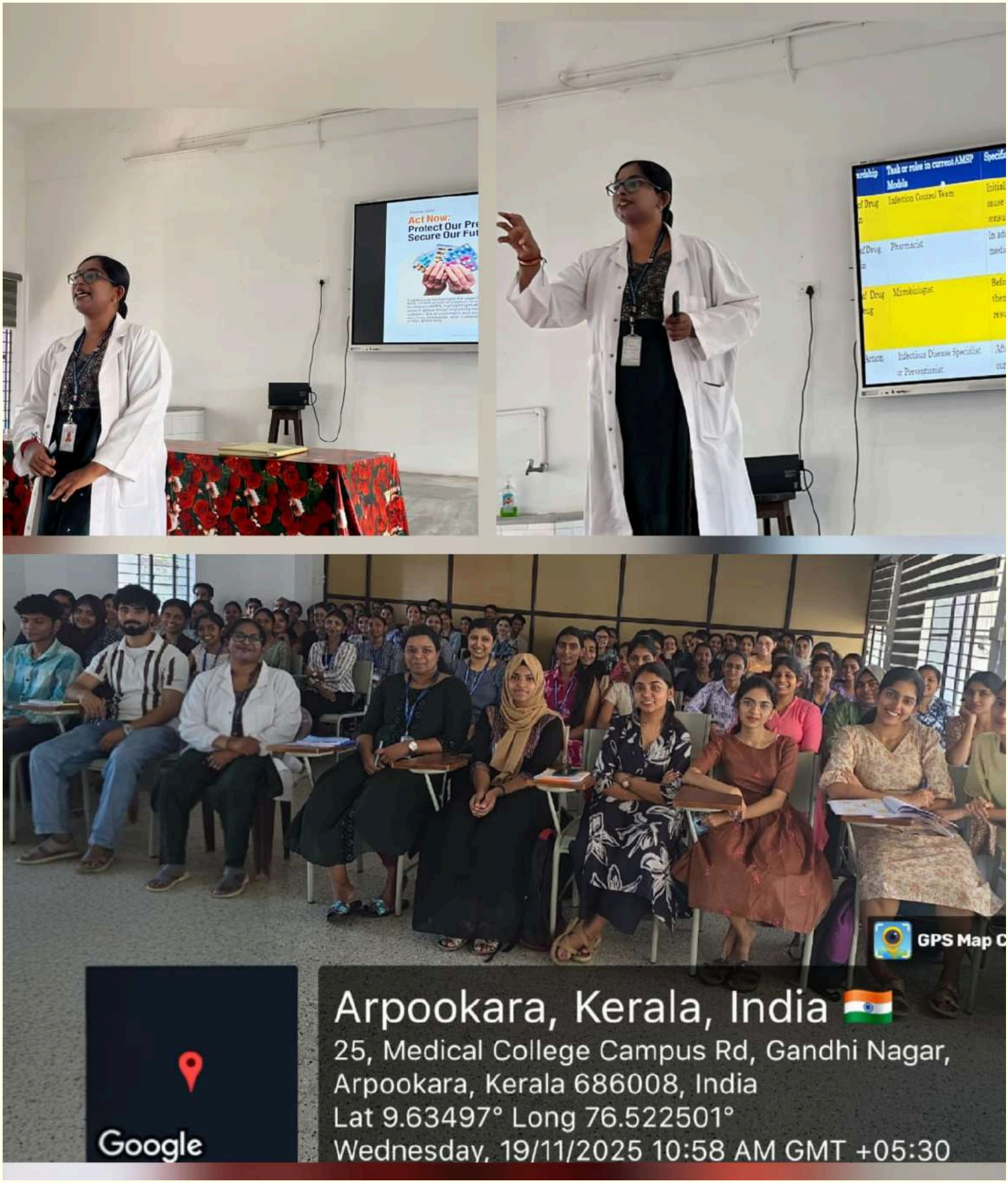
Mean Weight (g): Trimethoprim–Sulfamethoxazole 3040; Placebo 3019

Maternal Serious Adverse Events

No. of Events: Trimethoprim–Sulfamethoxazole 31; Placebo 33

WORLD ANTIMICROBIAL AWARENESS WEEK 2025

WORLD ANTIMICROBIAL AWARENESS WEEK 2025



WORLD ANTIMICROBIAL AWARENESS WEEK 2025

ROLE OF OPTIMAL USE OF ANTIBIOTICS IN AMR#WAAW 2025

Date: 21.11.2025

Time :02.45-03.45 PM

Venue: Auditorium, VPS Lakeshore Hospital

ANTIMICROBIAL DOSE ADJUSTMENT IN SPECIAL SCENARIOS

#CONFERENCE ON ANTIMICROBIAL RESISTANCE AWARENESS 2025

Date: 30.11.2025

Time :11.30-12.00

Venue: Diamond Jubilee Conference Hall, Caritas

#ACT NOW: PROTECT OUR PRESENT, SECURE OUR FUTURE#

WORLD ANTIMICROBIAL AWARENESS WEEK 2025

Antimicrobial Stewardship and Rational Antibiotic Use

MBBS 2024 BATCH

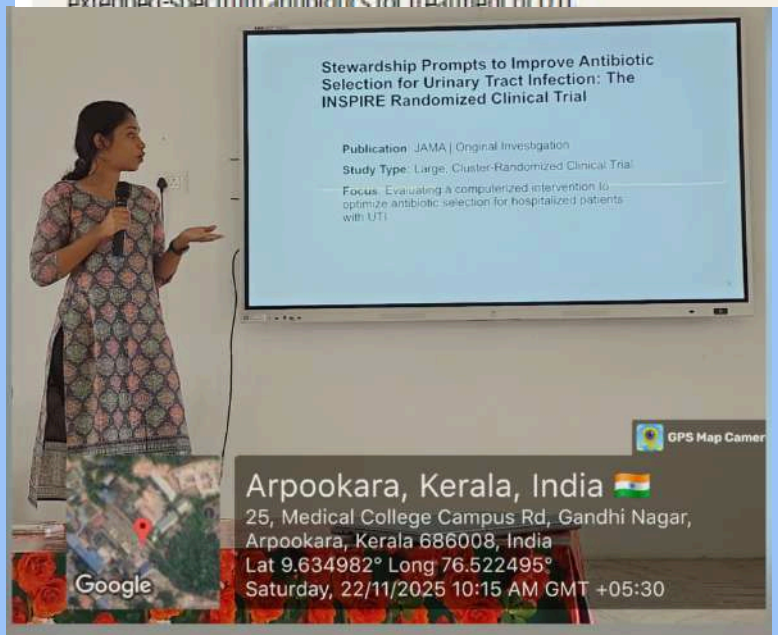
Stewardship Prompts to Improve Antibiotic Selection for Urinary Tract Infection
The INSPIRE Randomized Clinical Trial

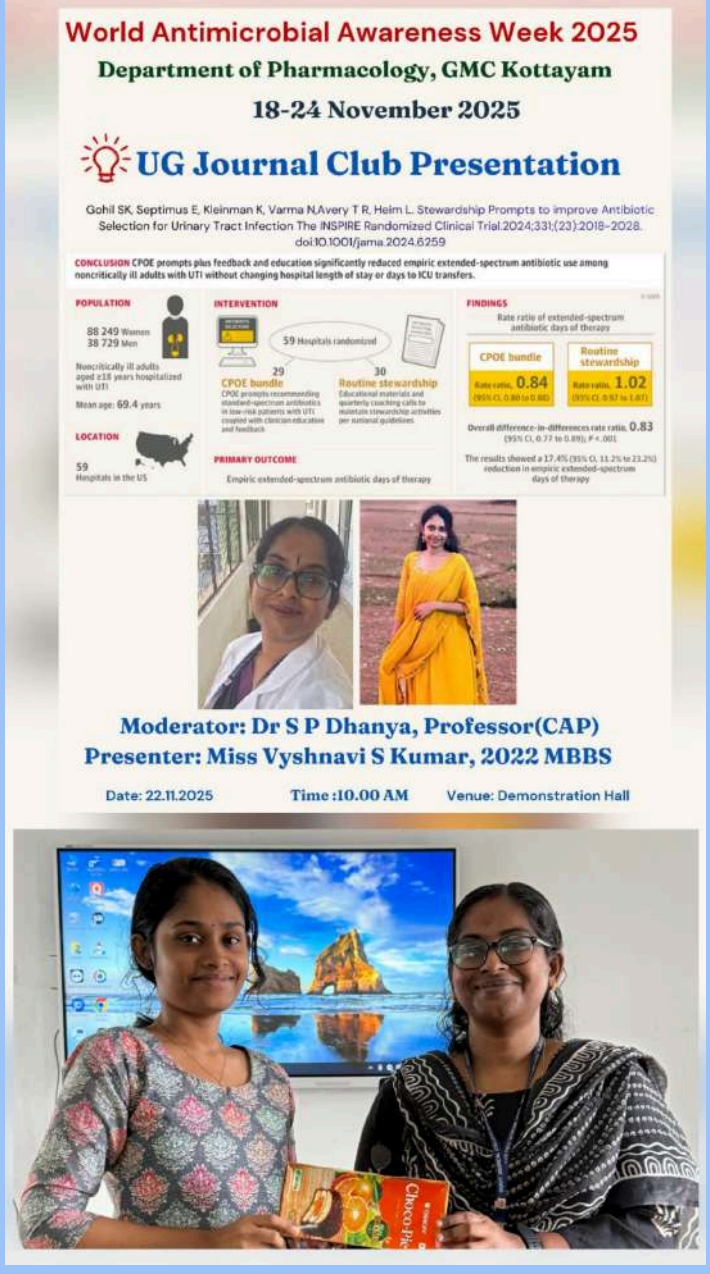
Shruti K. Gohil, MD, MPH; Edward Septimus, MD; Ken Kleinman, ScD; Neha Varma, MPH; Taliser R. Avery, MS; Lauren Heim, MPH; Risa Rahm, PharmD; William S. Cooper, PharmD; Mandelin Cooper, PharmD; Laura E. McLean, MEd; Naoise G. Nickolay, RPh; Robert A. Weinstein, MD; L. Hayley Burgess, PharmD; Micaela H. Coady, MS; Edward Rosen, BA; Selsebil Sljivo, MPH; Kenneth E. Sands, MD, MPH; Julia Moody, MS; Justin Vigeant, BA; Syma Rashid, MD; Rebecca F. Gilbert, BA; Kim N. Smith, MBA; Brandon Carver, BA; Russell E. Poland, PhD; Jason Hickok, MBA; S. G. Sturdevant, PhD; Michael S. Calderwood, MD, MPH; Anastasiia Weiland, MD; David W. Kubiak, PharmD; Sujan Reddy, MD, MSc; Melinda M. Neuhauser, PharmD, MPH; Arjun Srinivasan, MD; John A. Jernigan, MD, MS; Mary K. Hayden, MD; Abinav Gowda, BS; Katyuska Eibensteiner, BA; Robert Wolf, BS; Jonathan B. Perlin, MD, PhD; Richard Platt, MD, MSc; Susan S. Huang, MD, MPH

IMPORTANCE Urinary tract infection (UTI) is the second most common infection leading to hospitalization and is often associated with gram-negative multidrug-resistant organisms (MDROs). Clinicians overuse extended-spectrum antibiotics although most patients are at low risk for MDRO infection. Safe strategies to limit overuse of empiric antibiotics are needed.

OBJECTIVE To evaluate whether computerized provider order entry (CPOE) prompts providing patient- and pathogen-specific MDRO risk estimates could reduce use of empiric extended-spectrum antibiotics for treatment of UTI

Visual Abstract
Editorial page 1993
Multimedia
Related article page 2007
Supplemental content

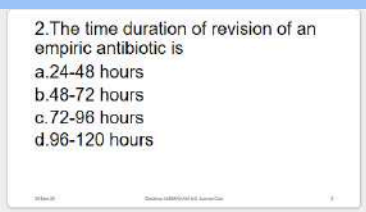




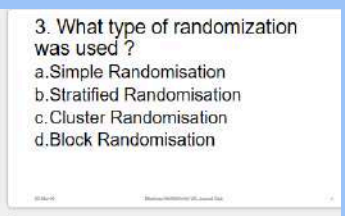
WORLD ANTIMICROBIAL AWARENESS WEEK 2025
QUIZ BASED ON JOURNAL ARTICLE

1

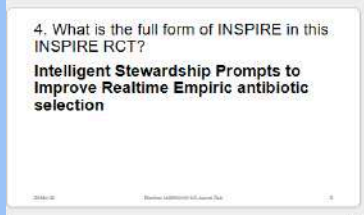
2 *



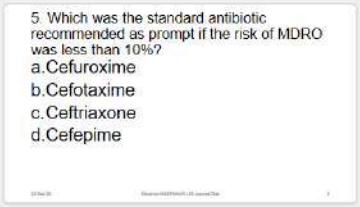
3 *



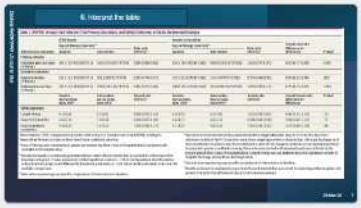
4



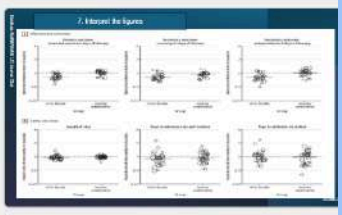
5 *



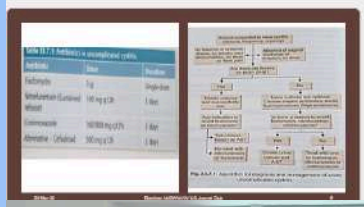
6 *

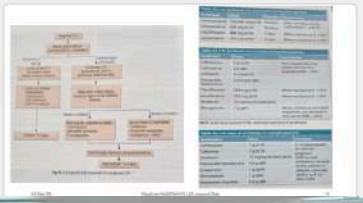


7

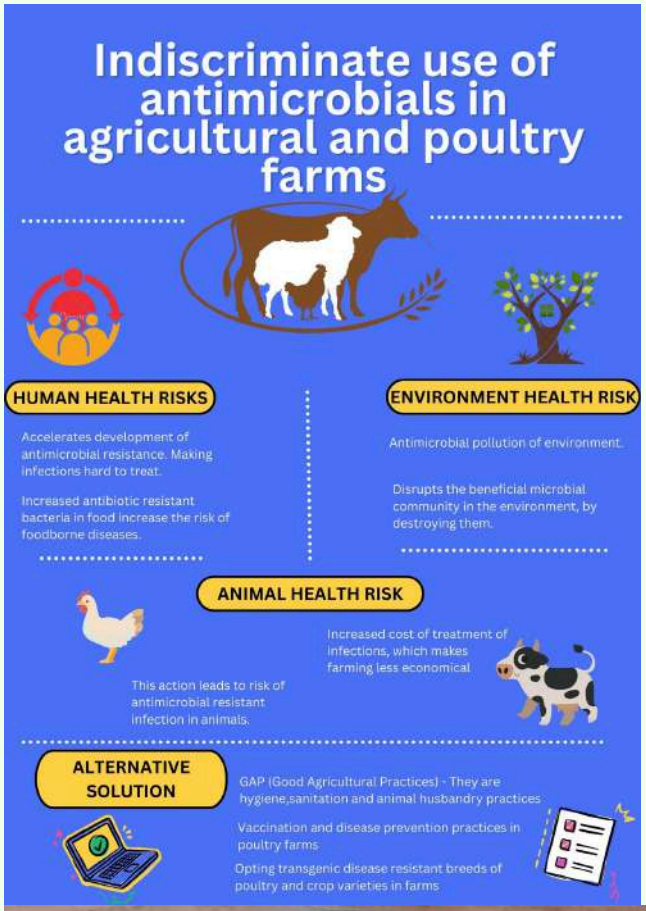


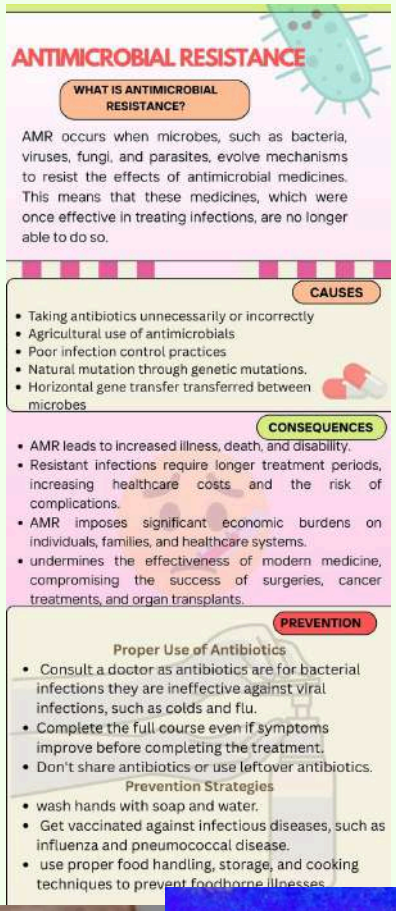
8

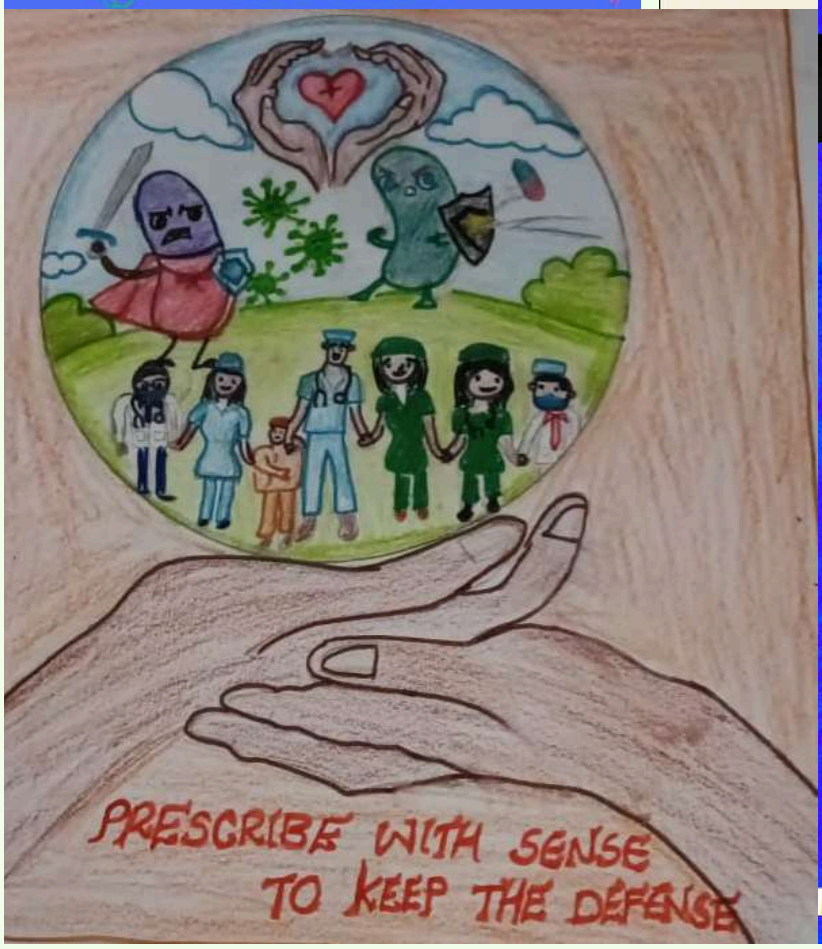


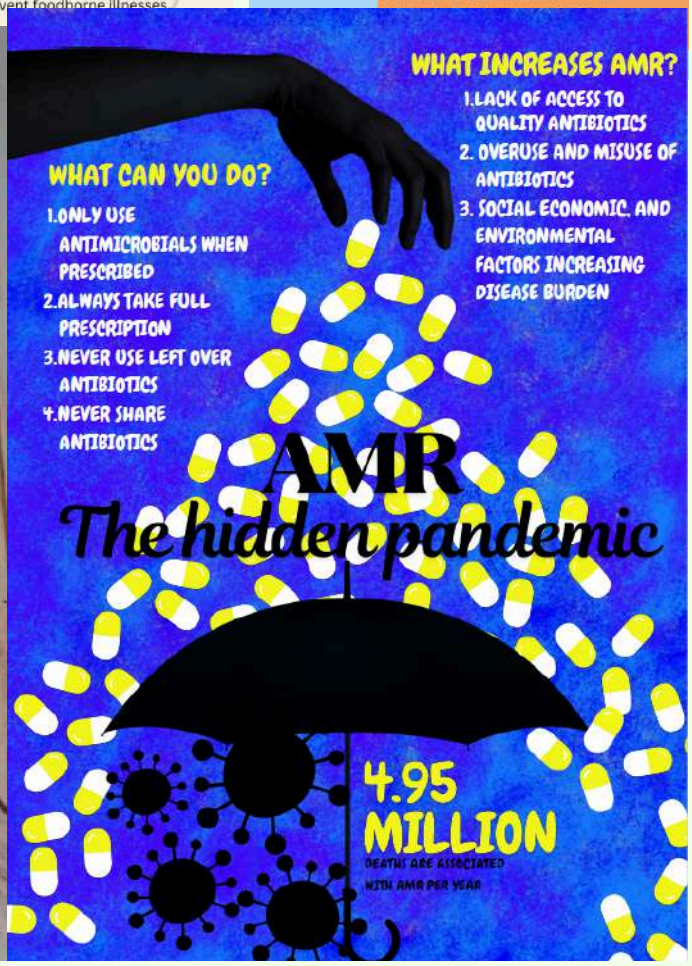


ANTIMICROBIAL STEWARDSHIP ELECTIVES FOR UNDERGRADUATES
ePosters-World Antimicrobial awareness week 2025

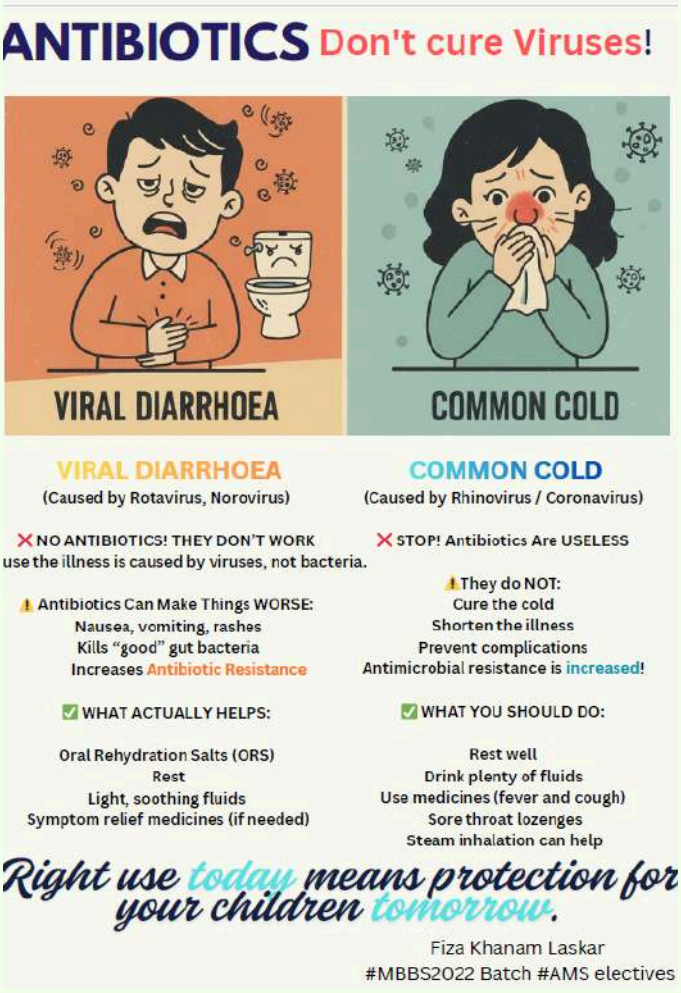


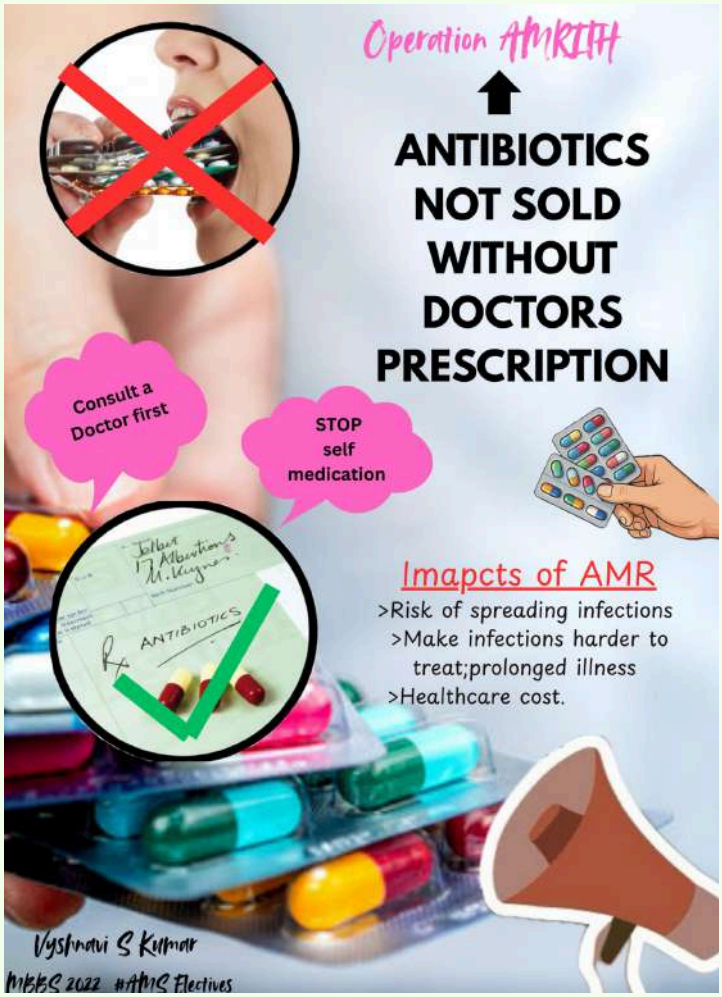


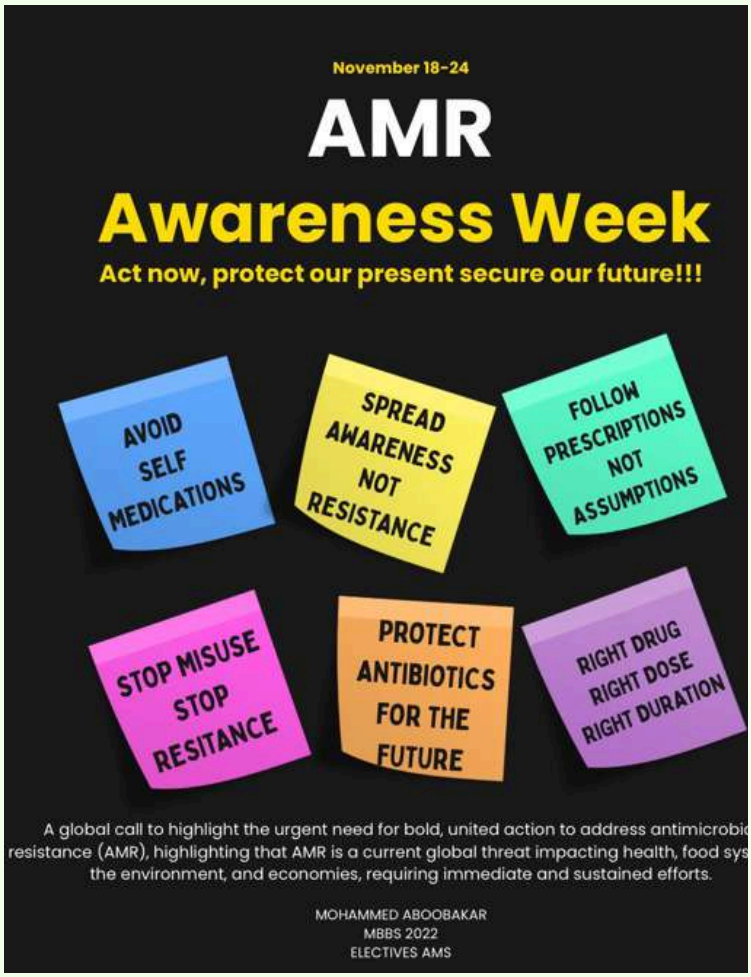




ANTIMICROBIAL STEWARDSHIP ELECTIVES FOR UNDERGRADUATES
ePosters-World Antimicrobial awareness week 2025







REPORT OF ANTIMICROBIAL STEWARDSHIP ACTIIVITIES 2025

A training of trainers workshop on “Point Prevalence Survey on Antibiotic Use for Government Medical Colleges of Kerala” was conducted at GMC, Thiruvananthapuram, on June 13, 2024. The training was conducted by the staff from the National Centre for Disease Control (NCDC). The department of Pharmacology conducted Point Prevalence Surveys throughout the year 2025 following this training. As a part of the Kerala Antimicrobial Resistance Strategic Action Plan (KARSAP), the department of Pharmacology was instructed to conduct prescription audits as well.

Point prevalence surveys are snapshot assessments to determine the percentage of patients receiving antibiotic treatment at a specific point of time. From January to December 2025, we conducted 12 point prevalence surveys in various wards and ICUs of GMC Kottayam after obtaining permission from Principal and Superintendent of the institution.

The dates of the surveys were fixed, and the head of the department as well as the faculty who were suggested as the contact persons were informed one day prior to the date of the point prevalence survey. Data were collected from the wards of medicine, surgery, orthopedics, obstetrics and gynecology, pulmonology, cancer, ENT, ophthalmology, dermatology, and pediatrics. We also collected data from the intensive care units, which included MICU, SICU, MCCU, CTVS ICU, Cardiology ICU, Burns ICU, TICU, Surgical Oncology, Neurosurgery ICU, and Radiation Oncology ICUs.

Key Suggestions after PPS

- Indication to start antibiotics to be noted
- The planned duration of the antibiotic should be indicated
- Strengthen use of generic names
- Reassessment and revision of antibiotics after 2 days or at the availability of the culture and sensitivity report, whichever is earlier
- Reason to be noted if antibiotics are continued for more than 7 days
- Reason to be documented if more than 2 antibiotics are prescribed
- More prescriptions from Access category of drugs
- Dual anaerobic coverage is to be avoided, e.g.Metronidazole with Piperacillin-Tazobactam
- Surgical antimicrobial prophylaxis to be restricted to the suggested dose(s)

From July 2025 onwards, with the help of OP Pharmacy staff, we have been involved in the calculation of the AWaRe audit from the Outpatient (OP) Pharmacy. Being a tertiary care institution, our target for Access Category is 85% in the OP department. In Jul-Sep 2025, our access usage was 67.98%, and in Oct-Dec 2025, it was 66.86%. The changing resistance pattern in our institution as indicated by the antibiogram prepared by the Microbiology department of our institution poses a big question in the achievement of the requisite target; at the same time, we need to restrict the use of watch and reserve categories of antibiotics whenever possible.

The outpatient pharmacy also provides data for prescription audits of OP prescriptions that include antibiotics, which were audited by the department for a few months in 2025. During the World Antimicrobial Awareness Week, we actively involved ourselves in the workshop conducted by IDU with Dr. Scaria Thomas P as the resource person, conducted training sessions for MBBS and Nursing students, held journal clubs on stewardship activities for undergraduates and postgraduates, and held a quiz based on critical appraisal of an article on antimicrobial stewardship. Our department offers antimicrobial stewardship as electives for undergraduates and trained 2021 and 2022 batch students in the year 2025. We encouraged them to actively participate in the department's antimicrobial stewardship activities. They also created awareness posters on antimicrobial stewardship.

Report prepared by Dr S P Dhanya,
Member, Antimicrobial Stewardship Committee

GLIMPSES OF UNDERGRADUATE TRAINING AND FORMATIVE ASSESSMENTS

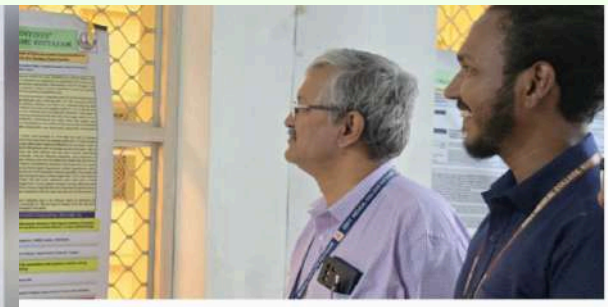
GLIMPSES OF FEEDBACK AND APPRECIATION AFTER COMMUNICATION ROLE PLAYS IN AETCOM AND PHARMACOLOGY

ELECTIVES IN PHARMACOLOGY

DR BASMA SHAJAHAN OF 2019 BATCH AWAREDED DR MARY SATYADAS MEMORIAL AWARD FOR ACADEMIC EXCELLENCE IN PHARMACOLOGY DURING CONVOCATION

INTER COLLEGIATE QUIZ -3RD PRIZE AT KARUNA MEDICAL COLLEGE

UG POSTER BY DR ARUN V OF 2021MBBS BATCH AT RESEARCH DAY



Emil Mani, Nandana P S and Rizvana of 2023 MBBS handing over the trophy to HOD Dr Sujatha MB, a proud moment for the department

SMALL SMALL PEARLS OF JOY AND TOGETHERNESS

Kattan Club of the department is a time of camaraderie, sipping hot black coffee and munching snacks, a time to connect with all in the department.
Arcadia has been our destination for PG treats for past several years.
Send offs though painful, are moments to recollect their journey in the department

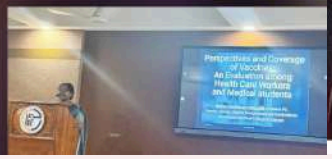
TIS THE THE SEASON TO BE JOLLY FA-LA-LA-LA, LA-LA-LA

“IT’S NOT HOW MUCH WE GIVE BUT HOW MUCH LOVE WE PUT INTO GIVING”

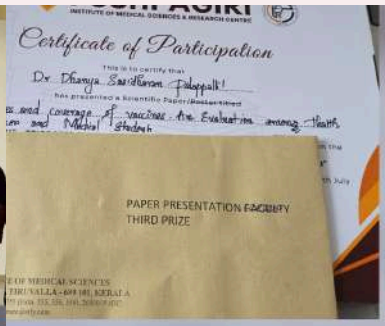
GLIMPSES OF FACULTY AND RESIDENT PRESENTATIONS IN VARIOUS CONFERENCES

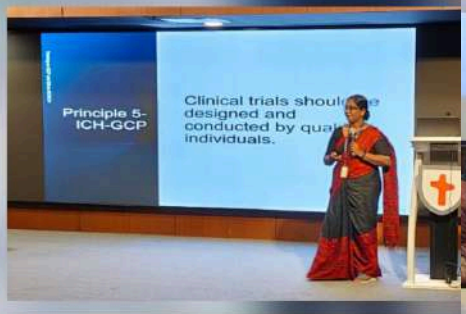
GLIMPSES OF FACULTY AND RESIDENT PRESENTATIONS IN VARIOUS CONFERENCES





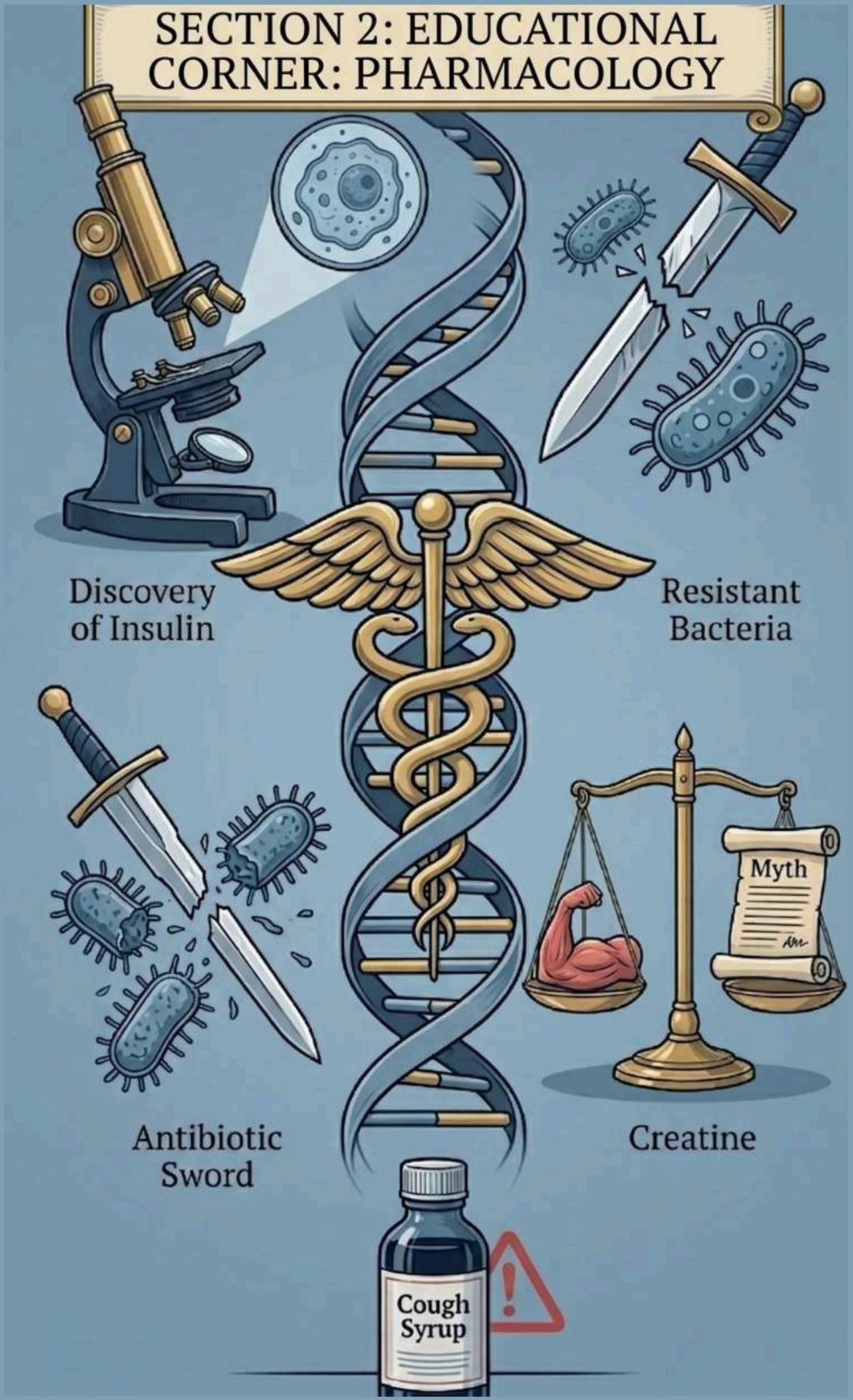







SECTION 2: EDUCATIONAL CORNER: PHARMACOLOGY



THE RECENT COUGH SYRUP TRAGEDY IN INDIA: A PHARMACOLOGICAL AND PUBLIC HEALTH PERSPECTIVE

Introduction

Recent reports of Pediatric deaths associated with contaminated cough syrups have raised serious concerns regarding drug safety, pharmaceutical quality control, and regulatory oversight in India. In 2025, multiple children—mostly under five years of age—died after consuming cough syrups contaminated with toxic industrial solvents, particularly diethylene glycol (DEG). The incident occurred mainly in the Chhindwara district of Madhya Pradesh and has drawn national and international attention to the quality assurance mechanisms in pharmaceutical manufacturing.

This tragic episode highlights the critical importance of Pharmacovigilance, strict adherence to Good Manufacturing Practices (GMP), and robust regulatory surveillance to prevent contamination of medicinal products and thus to ensure patient safety.

Background of the Incident

The outbreak was primarily linked to a pediatric cough syrup called Coldrif, manufactured by a pharmaceutical company in Tamil Nadu. Investigations conducted by drug regulatory authorities revealed contamination of the formulation with diethylene glycol (DEG), a toxic industrial chemical commonly used in antifreeze, brake fluids, and other industrial products and not meant for pharmaceutical use.

Following confirmation of contamination, the drug was banned, the manufacturer's license was suspended, and regulatory authorities initiated nationwide inspections of similar pharmaceutical products

Toxicology of Diethylene Glycol

DEG is a colourless, odourless, and sweet-tasting liquid—properties that make it a dangerous substitute for pharmaceutical-grade Glycerin or Propylene Glycol. Diethylene glycol poisoning occurs due to ngestion of contaminated medicines or industrial exposure. After absorption, DEG undergoes hepatic metabolism to toxic metabolites including diglycolic acid, which is responsible for systemic toxicity.

These metabolites primarily damage the renal tubules, leading to acute kidney injury. Metabolic acidosis and central nervous system depression are also frequently observed.

Children are particularly vulnerable because of lower body weight and immature metabolic pathways, resulting in rapid disease progression.

Historical Perspective

Diethylene glycol poisoning has caused multiple mass poisoning incidents globally. One of the earliest recorded tragedies occurred in the 1937 sulfanilamide disaster in the United States, where DEG used as a solvent resulted in over 100 deaths. This incident ultimately led to the enactment of the Federal Food, Drug, and Cosmetic Act (1938).

More recently, outbreaks of DEG poisoning associated with contaminated pediatric syrups have been reported in several countries, particularly affecting children under five years of age. These incidents highlight the persistent risks posed by inadequate pharmaceutical quality control.

Regulatory and Public Health Response

Following the recent tragedy in India, regulatory authorities such as the Central Drugs Standard Control Organisation (CDSCO) initiated several corrective actions:

- Nationwide inspection of pharmaceutical manufacturing units
- Testing of cough syrups and other liquid formulations
- Recall of contaminated batches
- Suspension of manufacturing licenses of responsible companies
- International health agencies also issued alerts advising stricter monitoring of pediatric syrups and raw pharmaceutical excipients.

Preventive Strategies

Preventing such tragedies requires coordinated action from regulators, pharmaceutical manufacturers, and healthcare professionals.

Important preventive measures include:

-Mandatory testing of glycerin and propylene glycol for DEG contamination

-Strengthening Good Manufacturing Practice (GMP) compliance

- Improved traceability of pharmaceutical raw materials

- Regular post-marketing surveillance of drug safety

- Increased awareness regarding rational use of cough and cold medicines in children.

Conclusion

The recent cough syrup tragedy in India serves as a stark reminder that drug safety cannot be compromised at any stage of pharmaceutical production. Even commonly used medications can become life-threatening if quality control measures fail.

For pharmacologists, clinicians, and public health professionals, this incident reinforces the importance of strict regulatory oversight, robust pharmacovigilance systems, and ethical responsibility in safeguarding patient health. Preventing similar tragedies requires sustained commitment from regulatory authorities, pharmaceutical industries, and the medical community.

Dr Sujatha M B

Professor and Head,Pharmacology
Member Secretary IRB,
Coordinatior, ADR Monitoring Centre
Member, Drugs and Therapeutics Committee,
Member, Executive Commitee, MRU,
Member, HICC
GMC Kottayam

THE DISCOVERY OF INSULIN

DR SCARIA THOMAS P.
MD (PHARMACOLOGY), MD (GENERAL MEDICINE), MRCP (UK)
Professor (CAP), Department of Pharmacology,
Government Medical College Kottayam

Though the Nobel Prize in Medicine/Physiology in 1923 was awarded to Frederick Grant Banting (1891 to 1941) and John James Rickard Macleod (1876-1935), major roles in the discovery of Insulin were played by Frederick Banting, Charles Herbert Best (1899-1978) and James Bertram Collip (1892-1965).

Banting got his Bachelor of Medicine degree from University of Ontario, Canada, in 1916. He got further training in Orthopedic surgery and was working as a lecturer in Pharmacology at the University of Western Ontario from 1921 to 1922, the period he discovered insulin. Banting had become deeply interested in diabetes. The work of Naunyn, Minkowski, Opie, Schafer, and others had indicated that diabetes was caused by lack of a protein hormone secreted by the islets of Langerhans in the pancreas. Many had tried to inject pancreatic extract in animals and failed because the pancreatic proteolytic enzymes destroyed the protein insulin.

Banting got the idea from Moses Baron that when the pancreatic duct was experimentally closed by ligatures, the cells of the pancreas which secrete trypsin degenerate, but the islets of Langerhans remain intact. With this idea, he approached Macleod, Professor of Physiology at the University of Toronto, who gave him the space and an assistant, Charles Best, then a medical student, who volunteered for it. They worked in a tiny lab and also took care of the dogs housed two floors above in the dog room. Though the role of Best was to assist in the chemical analysis of blood and urine of animals for sugar using a colorimeter, he and Banting helped each other in all activities related to the research.

They were able to isolate the islet cells without the acinar cells and then made an extract of the islet cells. Injected into dogs and found that it reduced blood sugar. But it had a lot of impurities. Macleod on reviewing the data assigned a biochemist-Collip, who made a purer version of the extract safe enough for injection. This refined extract was injected in the first patient Leonard Thompson with the blood sugar falling from 520 mg/dl to 120 mg/dl in 24 hours.This extract was given the name Insulin, coined by Edward Albert Sharpey-Shafer, which comes for the Latin word insula, meaning “island”. Though the Nobel prize was awarded to Banting and Macleod, Banting chose to share his prize with his partner, Dr. Best. Macleod chose to share his prize with Dr. Collip. Later Banting sold the patent rights for insulin to the University of Toronto for $1.

Early days

The discoverers were not able to improve their extraction technique and adapt it for mass production. So, they licensed their patented techniques to Eli Lilly and Company in Indianapolis (USA), where chemists developed an isoelectric extraction technique that yielded reliable quantities of insulin. August Krogh a Nobel laureate from Denmark

(whose wife Marie suffered from diabetes) along with Hans Christian Hagedorn a Danish physician and pharmacologist acquired European rights for insulin and set up the Nordisk Laboratorium. Hagedorn understood that adding protamine to insulin slowed absorption from injection site and thus created Protamine Zinc Insulin (PZI) in 1936 in collaboration with DA Scott and AM Fisher who were researchers at the Connaught Laboratories, University of Toronto. This was followed by the creation of Neutral Protamine Hagedorn (NPH) insulin also called Isophane insulin in 1946 by HC Hagedorn.

By 1950, DA Scott and AM Fischer along with K Hallas-Moller of Nordisk Laboratorium developed the zinc enhanced Lente insulin which did not contain protamine. So, the formulations of insulin available in the mid-20th century were- short acting Regular insulin, the intermediate acting Lente insulin and NPH insulin, and the long acting but unpredictable Protamine Zinc Insulin. But all these were of bovine or porcine origin.

In 1955, the British biochemist Frederick Sanger (1918–2013) managed to fully sequence the bovine insulin and discovered its exact composition in terms of amino-acids. For this discovery, Sanger won the Nobel Prize for Chemistry in 1958. For the discovery of the physical structure of insulin, the English biochemist Dorothy Mary Crowfoot-Hodgkin (1910–1994), a pioneer in the protein X-ray crystallography, was awarded the Nobel Prize in Chemistry in 1964.Insulin from cattle and pigs was used for many years to treat diabetes, but it caused allergic reactions in many patients.

The first genetically engineered, synthetic “human” insulin was produced in 1978 using E. coli bacteria by Genentech scientist Herbert Boyer in collaboration with City of Hope National Medical Center scientists Keiichi Itakura and Arthur Riggs. Genentech (USA) licensed its insulin rDNA technology to Eli Lilly. By the 1980s, major pharmaceutical companies such as Eli Lilly and Nordisk Laboratorium (which later became Novo Nordisk in 1989) transitioned their insulin formulations to recombinant human insulin leading to better response as well as reduced adverse effects like immunogenicity, hypersensitivity, and local complications. Thus began the modern era of human insulins and later insulin analogs.

.

.

THE CELEBRITY HALO EFFECT & THE ETHICS OF AESTHETIC PHARMACOLOGY

As we move through 2026, the cultural obsession with semaglutide has reached a critical tipping point. What began as a breakthrough for metabolic medicine has been rebranded as a lifestyle beauty tool. Semaglutide is an anti-diabetic medication used for the treatment of type 2 diabetes, and an anti-obesity medication used for long-term weight management and to reduce the risk of major adverse cardiovascular events.

It is a peptide similar to the hormone glucagon-like peptide-1 (GLP-1), modified with a side chain. It is sold under the brand names Ozempic and Rybelsus for diabetes, and under the brand name Wegovy for weight management and weight loss. In a world full of aesthetic trends and a pervasive focus on physical appearance, often driven by celebrities and social media influencers, the misuse of GLP-1 analog medications for aesthetic weight management, particularly Semaglutide (brand name Ozempic and Wegovy) has gained increasing popularity among the public . This trend raises critical questions about drug stewardship and physiological cost.

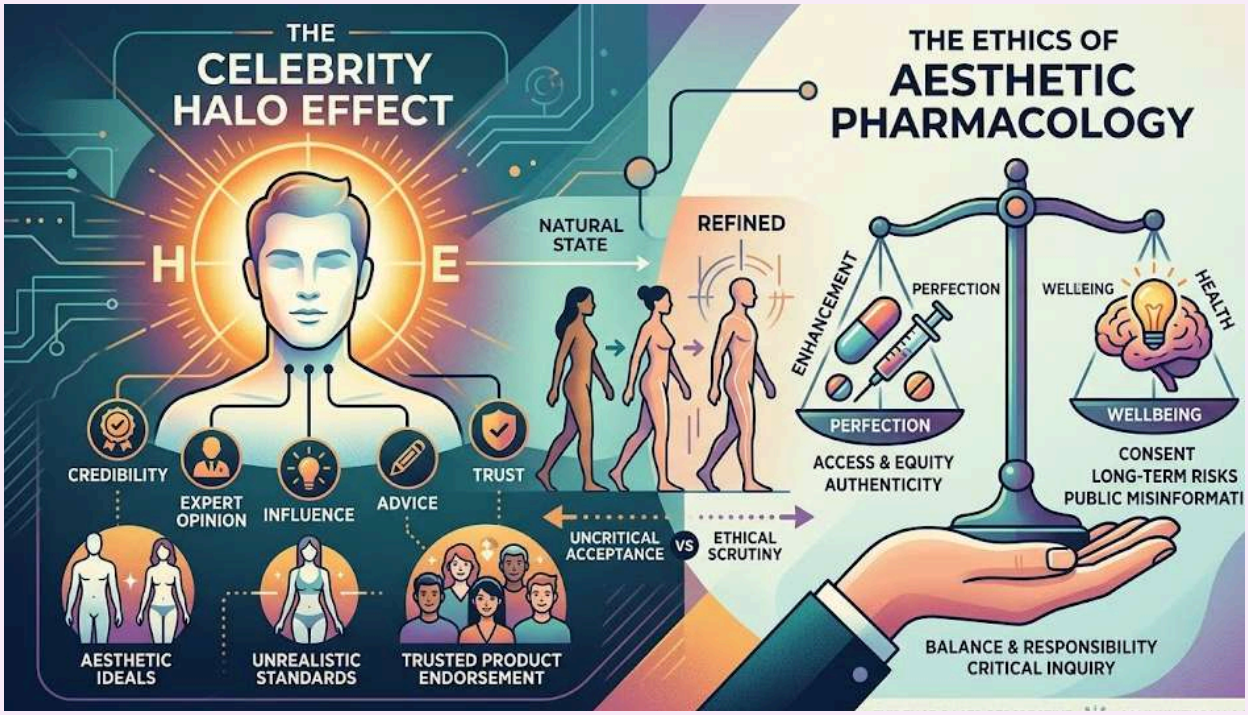
1. **The Physiological Buffer Problem**
When a patient with Type 2 Diabetes or Class III Obesity takes semaglutide, they are treating a profound metabolic dysfunction. Their body possesses a physiological buffer—the drug is correcting a pathologically high insulin resistance or a dysfunctional satiety signaling system. *The Clinical Risk: When a lean individual uses the drug to lose 5-10 lbs of vanity weight, they lack this buffer. They are essentially inducing a hormonal state of starvation in a healthy system. This often leads to over-correction, resulting in pronounced side effects such as acute hypoglycemia or gastroparesis, as the drug interferes with a system that was not previously broken.

.

2. **"Ozempic Face"**
Sarcopenia in Disguise The term “Ozempic face” refers to a side effect associated with the use of Ozempic (semaglutide). First described in 2023 by prominent American dermatologist Dr. Paul Jarrod Frank, the condition is characterized by a marked reduction in facial volume and soft tissue definition, primarily resulting from the rapid weight loss induced by semaglutide therapy. The media frequently references "Ozempic Face," but in a laboratory setting, this is identified as accelerated sarcopenia and acute adipose depletion. *The Science: Rapid weight loss via GLP-1 receptor agonist often results in a disproportionate loss of lean muscle mass alongside fat. *The Concern: For users seeking aesthetic shredding without rigorous resistance training or high protein intake, the aged look is a visual marker of muscle wasting. *The Metabolic Rebound: From a clinical perspective, this increases the risk of a rebound effect. Once the drug is stopped, the body replaces lost muscle with fat, often resulting in a higher body fat percentage than before the treatment began.

3. **The Shadow Market: Compounded "Ozempic-ish"**
Global demand continues to outstrip supply, leading to a rise in Compounded Semaglutide sourced from non-traditional outlets.

Salt Form Risks: Pharmacologists are increasingly concerned about salt forms (such as semaglutide sodium) which are not identical to the FDA-approved base molecule and lack long-term safety data. *Purity Standards: Many boutique longevity clinics are utilizing Research Only grade peptides. These lack the rigorous purity testing of commercial pens, leading to higher rates of injection site reactions, contamination, and unpredictable systemic dosing.



4. **The 2026 Reality: Long-Term Metabolic Impac**t Data from 2024–2026 has revealed a troubling phenomenon: the Metabolic Rubber-Band Effect. Unlike chronic patients who may remain on therapy for life, aesthetic users often view the drug as a temporary fix. *The 18-Month Rebound: New clinical data indicates that lifestyle users who cease medication regain weight four times faster than those using traditional lifestyle interventions. Most return to their baseline weight within 15–18 months. *Basal Metabolic Rate (BMR) Suppression: Because these users often lose up to 25% of their weight from lean muscle, the regained weight is almost exclusively adipose tissue. This leaves the individual with a significantly lower BMR and a broken metabolism.

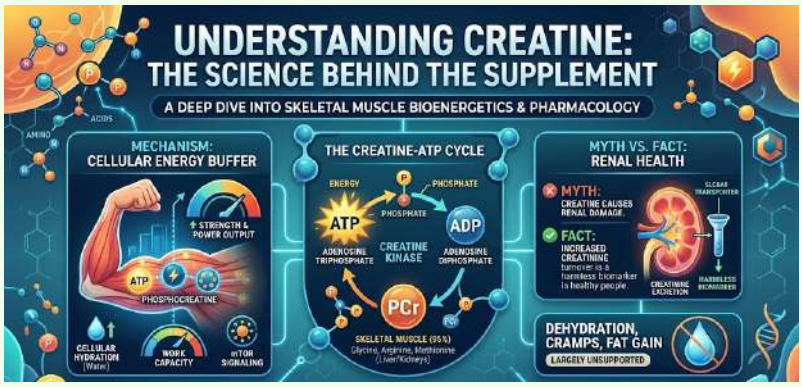
*Hormonal Dysregulation: Post-cessation, the body often overcompensates by spiking ghrelin (hunger) and suppressing leptin (satiety), creating a state of chronic hyperphagia that was not present prior to the intervention.

5. **Distributive Justice:** The Therapeutic Exclusion The most significant ethical hurdle remains the misallocation of resources. When semaglutide is prescribed off-label for cosmetic goals, it contributes to global shortages for patients who require the drug to prevent heart failure, kidney disease, or diabetic blindness. This is a classic case of Therapeutic Exclusion—where the healthy affluent displace the medically vulnerable in the supply chain.

Dr Gopika G L,JR1

CREATINE: MYTH AND REALITY – A PHARMACOLOGICAL PERSPECTIVE

Creatine is one of the most extensively studied ergogenic supplements, yet misconceptions about its safety and mechanism persist. Pharmacologically, creatine is a naturally occurring nitrogenous compound synthesized from glycine, arginine, and methionine in the liver and kidneys. About 95% is stored in skeletal muscle as free creatine and phosphocreatine, forming a critical component of the cellular energy buffer system.



Unlike anabolic steroids, creatine does not bind androgen receptors or alter hormonal pathways. Its mechanism is bioenergetic rather than endocrine. Through the creatine kinase reaction, phosphocreatine donates a phosphate group to ADP to rapidly regenerate ATP during high-intensity, short-duration activities. This enhancement of intracellular phosphagen stores improves strength, power output, and lean mass primarily via increased work capacity and cellular hydration effects. Emerging evidence also suggests modulation of signaling pathways such as mTOR, contributing indirectly to muscle protein synthesis.

A common myth is that creatine causes renal damage. Pharmacokinetically, orally administered creatine (3–5 g/day) is well absorbed and transported into muscle via the SLC6A8 transporter. A small proportion converts non-enzymatically to creatinine, which is renally excreted. Mild elevations in serum creatinine reflect increased turnover rather than nephrotoxicity in healthy individuals. Long-term studies have not demonstrated significant renal impairment in those without pre-existing kidney disease.

Concerns regarding dehydration, cramps, or fat gain are similarly unsupported. Initial weight gain is largely due to intracellular water retention, not adiposity. Overall, creatine is well tolerated, with occasional mild gastrointestinal discomfort. From a pharmacological standpoint, creatine is a metabolic modulator with a well-characterized safety profile and represents an evidence-based supplement when used within recommended doses.

Dr Asif Haris
JR2

VITAMIN D: A KEY NUTRIENT FOR BONE AND OVERALL HEALTH

Introduction

Vitamin D is an essential fat-soluble vitamin that plays a critical role in maintaining human health. Traditionally known for its importance in bone metabolism, research now shows that vitamin D also influences immune function, cardiovascular health, and the prevention of several chronic diseases. Despite its significance, vitamin D deficiency remains a widespread global health problem affecting people across all age groups.

Sources of Vitamin D

Sunlight is the primary natural source of vitamin D. When the skin is exposed to ultraviolet B (UVB) radiation from sunlight, it produces vitamin D3. Dietary sources contribute smaller amounts and include fatty fish such as salmon and mackerel, egg yolks, fortified dairy products, and supplements. Modern lifestyles often limit sun exposure because of indoor work, sunscreen use, and urban living, which contributes to widespread deficiency.

Role in Bone Health

Vitamin D plays a vital role in calcium and phosphorus metabolism. It enhances intestinal calcium absorption, which is essential for maintaining bone strength and structure. Adequate vitamin D levels support proper bone mineralization and skeletal development. Deficiency can lead to rickets in children and osteomalacia in adults, while long-term deficiency contributes to osteoporosis and increased fracture risk.

Emerging Non-Skeletal Benefits

Beyond bone health, vitamin D has several physiological roles. Many tissues contain vitamin D receptors, indicating broader biological functions. Research suggests that vitamin D helps regulate immune responses, supports metabolic health, and may reduce inflammation. Adequate levels have been associated with lower risks of certain cardiovascular diseases, autoimmune disorders, and infections.

Vitamin D Deficiency: A Public Health Concern

Vitamin D deficiency is increasingly common worldwide. Risk factors include limited sun exposure, darker skin pigmentation, obesity, aging, and chronic illnesses. Low vitamin D levels have been linked with impaired bone health, increased susceptibility to infections, and possible associations with metabolic and cardiovascular conditions. Serum 25-hydroxyvitamin D measurement is the best indicator for assessing vitamin D status.

Maintaining Adequate Levels

Adequate vitamin D levels can be maintained through safe sunlight exposure, a balanced diet, and supplementation when necessary .It is recommended to maintain serum 25-hydroxyvitamin D levels above 20–30 ng/mL for optimal bone health. Supplementation should ideally be guided by healthcare professionals because excessive intake can lead to toxicity.

Conclusion

Vitamin D remains a cornerstone of both skeletal and overall health. Increasing awareness about its importance, encouraging safe sunlight exposure, and identifying individuals at risk of deficiency can help improve health outcomes. Ensuring adequate vitamin D intake through lifestyle measures and appropriate supplementation is an important step toward preventing several health complications.

Dr Riyas Muhammed
JR1

LOVE: A PHARMACOLOGICAL PERSPECTIVE

Love is a multifaceted, complex, mysterious blend of emotions and cognitive experience that it is very difficult to elucidate the feeling.

According to ancient Greek philosophy, love is categorized into eight different types - Eros, Philia, Storge, Agape, Ludus, Pragma, Philautia and Mania.

Eros: Sexual and passionate love

Philia: Love between friends based on deep trust and mutual respect

Storge: Love between family members

Agape: Unconditional, selfless love for everyone and everything

Ludus: Playful love that involves flirting and casual relationships

Pragma: Long lasting love grounded in commitment, duty and responsibility

Philautia: Self-love and self-compassion

Mania: Obsessive, jealous loveIntroduction

In modern psychology, Robert Sternberg developed a "Triangular theory of love" which states that every relationship is built on three key concepts that form three points of a love triangle –Passion (includes sexual and physical attraction and that feeling of romance), Intimacy (based on an emotional bond and a feeling of closeness and comfort) and Commitment (intentional decision to love another person and the work that is required to maintain that relationship). As per varying degree of these three components, there are eight different types of love namely Non-love, Liking,infatuation, Empty love, Romantic love, Companionate love, Fatuous love and Consummate love.

Love - Is it a powerful emotion? Or essentially a physiological drive?

Love is often described in art, literature and films as a pure, very delicate, solacing feeling of heart and we draw a heart to represent love. But love starts in the brain, not in the heart. Love is a cocktail product of various neuropeptides and neurotransmitters like dopamine, norepinephrine, serotonin, endorphins, nerve growth factor, cortisol, oxytocin, vasopressin etc.

Love is the most researched, but least understood emotion. It has been postulated that romantic love involves cognitive, emotional and behavioural components and are influenced by various afore-mentioned brain chemicals. Cognitively, it is marked by intrusive thoughts about the partner, idealization and a strong desire for mutual understanding. Emotionally, it encompasses feelings of attraction, distress when the relationship is under threat, longing for reciprocation, a desire for deep connection and physiological arousal. Behaviourally, it exhibits actions like seeking the partner's attention, studying their behaviour, performing acts of service and maintaining physical proximity.

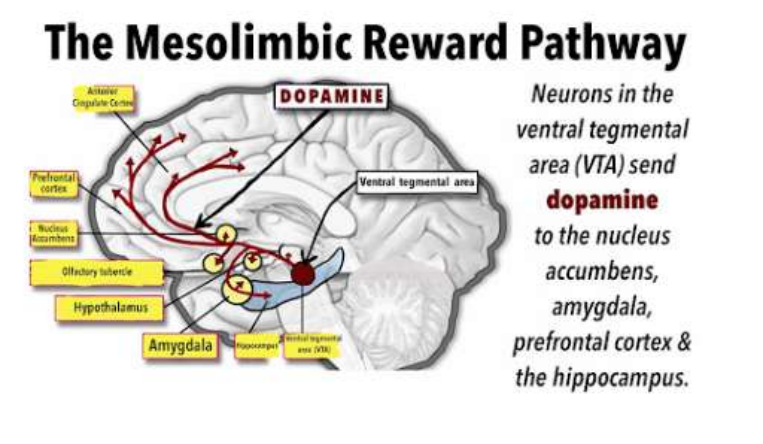
This article is an attempt to uncover the neurochemical aspects of romantic love – simply the lifecycle of romantic love in three stages – from the storm of new love to the calm of long term partnership – Falling in love, Being in love and Staying in love.

.

Falling in love: Neurotransmitters of attraction and infatuation

The most exciting or dramatic phase of love – Phase of Attraction and infatuation – Phase of flush of feelings, butterflies, intense longing or emotional intensity. Dopamine and Norepinephrine are the primary neurotransmitters operating in this early phase of romantic love.

Dopamine act as the feel good neurochemical in romantic love creating euphoria and exhilaration which is definitely unutterable. The areas in the cortex including the medial insula,anterior cingulate, hippocampus and in the subcortex including parts of the striatum and also the nucleus accumbens together constitute core regions of the brain reward system. When experiencing love, dopamine activates the dopaminergic mesolimbic reward pathway and contributes to the pleasurable experience which can be equated to the euphoria associated with cocaine or alcohol use.



Functional MRI studies of individuals intensely in love shows significant activation in dopamine-rich areas specifically the ventral tegmental area (VTA) and the caudate nucleus which confirms romantic love is not just an emotion, but a motivation system.

As stated previously, the neurochemical profile of early-stage romantic love closely resembles “drug addiction” utilizing the same mesolimbic reward pathways. So deserted lovers because of drastic drop in dopamine can mirror as withdrawal symptoms like mood swings, sleep disruptions, loss of appetite or even fall into clinical depression

Norepinephrine, released in the initial stages of romantic love, is responsible for the physiological and stimulatory symptoms of infatuation. Increased central norepinephrine activity produces alertness, energy, sleeplessness, loss of appetite, increased attention and increased memory for new stimuli which characterize the earlier phases of human love. Also increased norepinephrine level in the periphery causes tachycardia, palpitations, a rise in blood pressure, sweating and trembling hands in the presence of the beloved. With this exaggerated stimulatory effect on the heart, love is “perceived as centred in the heart” rather than in the brain. This increase in the central nervous system causes an increased attention and focussing on the beloved so that small details about love are remembered.

Phenylethylamine (PEA) is the precursor molecule for dopamine and noradrenaline. Idea of “first sight love” is believed to occur because of heightened levels of PEA in the brain which makes one experience ‘sway away’ feel subjected to those involved in romantic love. The PEA leads to unleash of dopamine surge and so the major role of PEA is more of a neuromodulator.

The early stages of romantic love seem to correlate with another substance nerve growth factor (NGF) which has been found to be significantly higher in those subjects who had recently fallen in love compared to subjects who were single or engaged in a long-lasting relationship. A positive association between the intensity of early romantic feelings and serum levels of NGF has been identified.

The formation of a new romantic relationship is associated with significant alterations in behavioural and biological “stress response”. In the early stages, individuals often exhibit increased stress especially associated with the initiation of a social connection or increased attention on subtle nonverbal cues with a heightened fear of rejection. Newly formed romantic relationships usually within the first six months are associated with higher baseline plasma cortisol compared to singlehood or long-term relationships.

An increase in dopamine and cortisol is coupled to a decrease in another neuromodulator namely serotonin or 5-HT which is linked to mood. Studies have shown a depletion of serotonin in early stages of romantic love to levels that are common in patients with “obsessive-compulsive disorders (OCD)”. Love is a kind of obsession and in its early stages commonly immobilizes thought and channels in the direction of a single individual. Individuals with a higher predisposition to fall in love also have lower blood serotonin levels compared to those who have never been in love. Individuals in the early stages of romantic love exhibited temporarily similar platelet 5-HT transporter densities (a measure that is linked to the density of this transporter in the brain) to individuals with OCD. The prefrontal serotonergic projection and the serotonin 2 receptor seems to be associated with the manic, stalking aspect of romantic love.

Traditional belief about romantic love is “Love is blind”. The reason may be due to the neural pathway, connected between Nucleus accumbens and corpus amygdyloideum, accountable for negative emotions, judgment and social reasoning “ceases”.

Being in love: Emotional regulation and stability

WHAT HAPPENS ONCE THE DOPAMINE LEVEL FALLS?

As the individuals shift from early love, cortisol serotonin levels returns to normal and love reserves as a stress buffer. Intense cravings towards love reduces and emotional regulation will get impproved. When measured again after 12-18 months who were still in love, the serotonin transporter density had returned to levels equivalent to the participants that were not in love, which suggests that romantic love is accompanied by a transient change in the serotonergic system. This holds true for males while women shows opposite pattern. In other words, men that were in love had lower plasma and serum serotonin levels than men that were not in love while women that were in love had higher plasma serotonin levels than women that were not in love. The reason for this complete reversal of the effect of romantic love on peripheral serotonin levels in different genders remains unexplained.

Genetic components affecting serotonin signalling are emerging as additional factors influencing behaviour in romantic relationships. The G allele of the C-1019G (rs6295) polymorphism leads to a higher expression of the 5-HT1A gene which encodes a G protein-coupled receptor for 5-HT. It was shown that individuals with the CG/GG genotype reported greater difficulty in identifying their feelings and seemed to be less comfortable to have a close relationship to others than individuals with the CC genotype. A study on 579 Chinese undergraduate students showed that individuals carrying the G allele (CG/GG) of C-1019G polymorphism were more likely to be single than CC carriers.

Even though some researchers have speculated that selective serotonin reuptake inhibitor (SSRI) use is associated with negative romantic love outcomes, but later studies show that SSRI use is not associated with intensity of romantic love, obsessive thinking about a loved one or commitment in a sample of young adults experiencing romantic love.

Staying in love: Hormonal basis of bonding and attachment

In some individuals, love doesn’t end with mere attraction and emotional balance, but in long term relationship. Which chemicals helps in navigating through this phase?

Oxytocin and vasopressin are closely related peptide hormones consisting of nine amino acids and a difference in the third and eighth amino acids make the difference between them. They are synthesized in the hypothalamus and released from the posterior pituitary gland.As the initial phase of romantic love characterized by infatuation and mutual attraction moves into a more stable, secure attachment love marked by loyalty and secure partnership, oxytocin and vasopressin have shown to play critical roles in this phase.

In humans, supporting evidence shows that oxytocin, the love or cuddle hormone, enhances trust, empathy and ability to bond or affiliate with others. It has been shown that higher circulating oxytocin concentrations help individuals focus on their partner's positive attributes and appreciate them and are linked with lower distress and better quality of marriage by exhibiting mutual support, warm contact, physical intimacy, proximity, and frequent hugging. Pharmacological studies have demonstrated that exogenous oxytocin administration is sufficient to induce pair-bonding behaviour in animals, prairie voles, while the administration of oxytocin receptor antagonists disrupts these behaviours. Increased oxytocin levels in men and women have been shown to improve overall health including cardiovascular health and immune function as well.

Vasopressin helps in the pair bonding, long term attachment and protective nature in love. Some studies investigating the effect of vasopressin on genetic background shows that humans have three microsatellite polymorphisms in the 5′ regulatory region of the AVPR1 gene and can influence behavioural consequences. Males carrying shorter alleles and increased vasopressin receptor expression reported lower social bonding, more frequent crises, lower quality of marriage and perceived problems in partnership. A series of studies provided evidence that oxytocin and vasopressin modulate social behaviour in relationships. The intranasal administration of oxytocin could enhance trust behaviour. Researches on oxytocin and vasopressin are being carried out for the treatment of autistic spectrum disorder and posttraumatic stress disorder.

In short: Dopamine and Norepinephrine sets the fire of love, Serotonin manages the heat of love and finally Oxytocin and Vasopressin keep the warmth of love for a life time.

Dr Hyma V, Assistant Professor,
Nodal Officer IEDC,
Member ,Drugs and Therapeutics Committee
Member, KUHS and NABH Accreditation Cell

LET'S REVISIT PARACETAMOL: AS QUESTION AND ANSWER FORMAT

Question 1: Difference between Paracetamol and NSAIDs?

Answer: Paracetamol is an antipyretic and analgesic drug but not an anti-inflammatory drug. With respect to adverse drug reactions, paracetamol has very less chance of nephrotoxicity and GI toxicities like peptic erosions and ulcer. Paracetamol has dose related hepatotoxicity but NSAIDs can cause idiosyncratic hepatotoxicity. Skin rash due to paracetamol is much lesser compared to NSAIDs.

NSAIDs which can aggravate AERD (Aspirin Exacerbated Respiratory Disorder) unlike paracetamol. Paracetamol unlikely to cause cardiovascular toxicities like worsening of hypertension, heart failure, coronary ischemia, bleeding, antiplatelet compared to NSAIDs.

Question 2: Maximum Doses of Paracetamol?

Answer: Maximum dose under physician supervision for person younger than 75 years can be 4g/day or 60mg/Kg/day, whereas the maximum dose for unsupervised use is 3g/day or 45mg/Kg/day. For chronic alcoholic with compensated liver disease or patients on warfarin, the maximum dose is 2g/day. But paracetamol should not be given if patient has decompensated liver disease. In patients aged more than 75 years or frail elderly, and patients taking INH (Isoniazide) or Rifampicin, older anti-epileptics (Phenytoin, Phenobarbitone, carbamazepine) the maximum dose is 2g/day. Because rectal bioavailability is typically lower (60-70% of oral), the recommended doses are slightly higher to achieve therapeutic plasma concentrations of 10-20 microgram/mL. A rectal loading dose of 30-40 mg/kg is often suggested, followed by maintenance doses of 20 mg/kg.

Question 3: Paracetamol combinations critique?

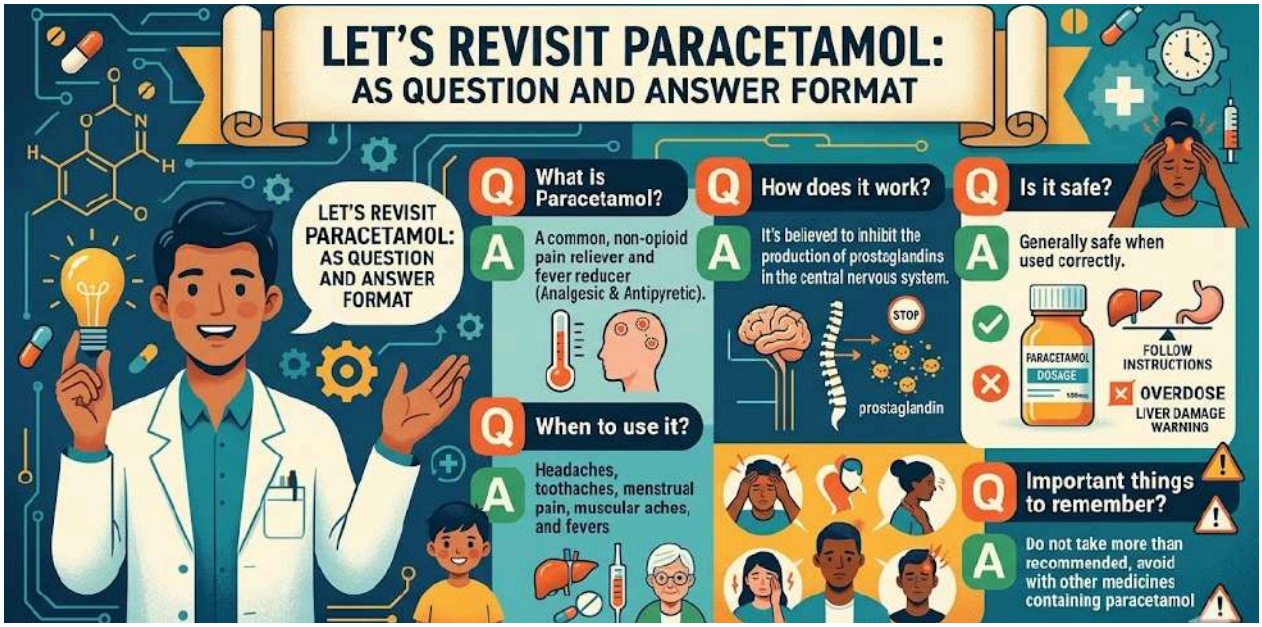
Answer: Paracetamol usually in combinations with an anti-emetic are available for use Migraine headache contain only 325mg. Similarly, combinations with NSAIDs like Ibuprofen or Aceclofenac and skeletal muscle relaxants, also contain just 325mg of Paracetamol or even lesser. Paracetamol in combinations with opioids like tramadol also are also usually underdosed. Hence always do check whether there is underdosing of paracetamol while prescribing such combinations. The Indian pharmaceutical market has been saturated with FDCs, many of which are deemed "irrational" due to a lack of synergistic efficacy or mismatched pharmacokinetic profiles. The Central Drugs Standard Control Organisation (CDSCO) have recently prohibited a wide range of these products to safeguard public health.

Question 4: What is the mechanism of action of Paracetamol?

Answer: Paracetamol was believed to be solely from its COX (Cycloxygenase) dependent inhibitory effect on PG synthesis. Recent data suggestive of analgesic mechanism to be a multimodal and in addition also involves several pathways within CNS, such as endocannabinoid, serotonergic and nitric oxide. Following hepatic deactylation to p-aminophenol crosses the blood brain barrier converted to N- arachidonoyl phenol amine (AM404), which is believed to be responsible for its analgesic effects.

Question 5: When to give Paracetamol as round the clock or sos/prn?

Answer: Paracetamol is usually given as sos/prn when used as an antipyretic, and may be given as round the clock when used as analgesic especially in



chronic pain conditions like cancer. But in fever, it may be used round the clock, especially in high grade fever to prevent fever spikes, as chances of dehydration increases when such fever spikes occur frequently.

Question 6: Why is the distinction between concentrated oral drops and pediatric suspensions a common source of medication errors in India?

Answer: In India, paracetamol is available in multiple oral liquid strengths: 100 mg/mL (concentrated drops), 120 mg/5 mL (pediatric suspension), and 250 mg/5 mL (forte suspension). Dosing errors, including ten-fold overdoses, are common when these products are confused. Concentrated drops (100 mg/mL) are intended for infants to allow for a small volume of administration, whereas suspensions are more dilute. If a clinician prescribes 5ml of paracetamol without specifying the concentration, and the parent uses the 100 mg/mL drops instead of the 120 mg/5 mL suspension, the child receives 500 mg instead of 120 mg. Physicians must always specify the dose in both milligrams (mg) and milliliters (mL) and confirm the concentration available to the patient. Furthermore, parents should be instructed to use only the calibrated measuring device (dropper or syringe) provided with the specific product, as household spoons can vary.

Question 7: What are the critical drug interactions between paracetamol and first-line anti-tuberculosis (Anti-TB) medications?

Answer: The interaction between paracetamol and Anti-TB drugs like Isoniazid and Rifampicin is a common concern in India. Isoniazid is a potent inducer of CYP2E1, the enzyme responsible for the metabolic activation of paracetamol to NAPQI. Chronic Isoniazid therapy increases the risk of paracetamol-induced hepatotoxicity, particularly in cases of overdose or even at high-therapeutic doses. Rifampicin also induces several cytochrome P450 enzymes (including CYP3A4), which may further accelerate the formation of NAPQI. Patients on ATT (Anti-Tuberculosis Treatment) already carry a baseline risk of drug-induced liver injury (DILI). Therefore, paracetamol should be used sparingly in these patients, and LFTs should be monitored frequently if the patient requires regular analgesic therapy.

Question 8: What is the 2024-2025 consensus on the safety of paracetamol during pregnancy and breastfeeding?

Answer: Paracetamol remains the analgesic/antipyretic of choice during pregnancy, as NSAIDs arecontraindicated (especially in the third trimester due to risks like premature closure of the ductus arteriosus). Historically, there have been concerns about a potential link between prenatal paracetamol exposure and neurodevelopmental disorders like ADHD or autism in offspring. However, a 2024 large-scale sibling-controlled study and a 2026 meta-analysis published in The Lancet have largely debunked this link. These robust analyses show that when adjusting for familial genetic factors and maternal health, there is no evidence that paracetamol causes autism or ADHD. In breastfeeding, paracetamol is considered safe as the concentrations reaching breast milk are clinically insignificant.

Question 9: When should LFT monitoring be initiated for a patient on regular paracetamol therapy?

Answer: Routine LFT monitoring is not necessary for short-term use in healthy adults. However it should be considered in Dengue Patients (Due to the risk of baseline and drug-exacerbated transaminitis), Chronic Use (Patients taking greater than 35g /day for more than 5-7 days, especially if they are geriatric or have a low weight), Co-morbidities (like hepatitis, alcohol use disorder, or those on anti-TB or other CYP enzyme inducer medications)

Question 10: Is paracetamol associated with severe cutaneous adverse reactions like Stevens-Johnson Syndrome (SJS)?

Answer: The incidence is very low (1-6 per million person-years), but the mortality is high (up to 30% in TEN). Physicians must instruct patients to stop paracetamol immediately and seek emergency care if they develop a new rash or mucosal sores while taking the medication.

Dr Jiyo Chacko,
Assistant Professor
Deputy Coordinator, ADR Monitoring Centre
Member, Drugs and Therapeutics Committee

GUT MICROBIOME: THE HIDDEN PHARMACOLOGIST INSIDE US

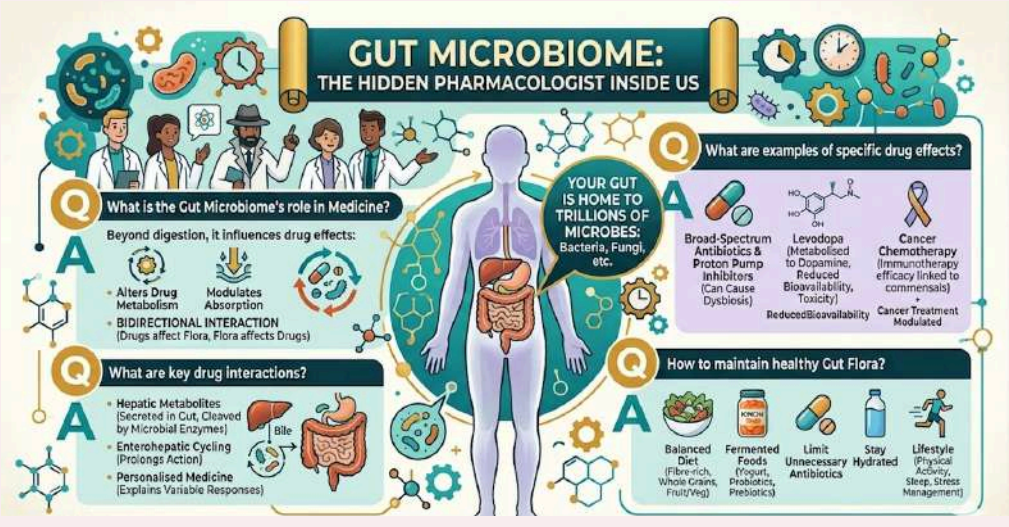
When we think about how medicines work, we often picture the liver, kidneys, and various other parts of the body, which play a key role in pharmacokinetics and Pharmacodynamics of the drug. But there is also another key player quietly influencing drug effects: the gut microbiome. The gut microbiome can often be referred to as a hidden or invisible agent.

Our gut is home to trillions of bacteria, fungi, and other microorganisms. Beyond digesting food, these microbes can metabolise drugs, alter their absorption, and even change their effectiveness or side effects.
The relationship between the gut microbiome and drugs is complex and bidirectional. Drugs like broad-spectrum antibiotics can affect gut flora, and gut flora can, in turn, alter the absorption and individual response to drugs. So, the gut microbiome can alter the safety and efficacy of the drugs.

When a drug is administered orally, it comes in contact with the diverse microbial communities of the gastrointestinal tract, and it undergoes various biochemical transformations, which can affect its absorption and lead to variability in plasma concentrations. Additionally, drug conjugates such as gut glucuronides excreted via bile may be cleaved by microbial enzymes, releasing the active drug back into the intestinal lumen. This will be taken up by enterohepatic cycling, which will further prolong the duration of drug availability and action.
Understanding these interactions is increasingly important in personalised medicine, where microbiome composition may be one of the factors that will explain why patients respond differently to the same drug.

Examples of gut microbiome and drug interactions

- Proton pump inhibitors will cause reduced acidity in the gut, leading to colonisation of bacteria, which may cause enteric infections
- Certain drugs, like broad-spectrum antibiotics, Metformin, Statins, Laxatives, β blockers, ACE inhibitors, selective serotonin reuptake inhibitors and antidepressants, may also cause changes in gut flora, which in turn will affect the drug efficacy and safety.
- Hepatic metabolites secreted into the gut may further undergo biochemical reactions to free the drug by the gut microbiome, which may increase the availability of drugs
- Gut microbial decarboxylase can metabolise Levodopa to dopamine in the gut, leading to reduced bioavailability and may also cause toxicity due to its conversion to m-tyramine. Entacapone is another drug which is used in the treatment of Parkinsonism. It is metabolised by E. faecalis, whereas Entacapone, in turn, will affect the growth of different microbes in the gut.
- Gut microbiomes are also important in modulating the clinical response to cancer chemotherapy. Low abundance or absence of gut commensals will decrease the efficacy of antitumour drugs, especially with immunotherapy.



These are some of the examples. Many other interactions are also there. So, it is important to maintain healthy gut flora for optimal efficacy and safety of the drugs.

HOW TO MAINTAIN HEALTHY GUT FLORA

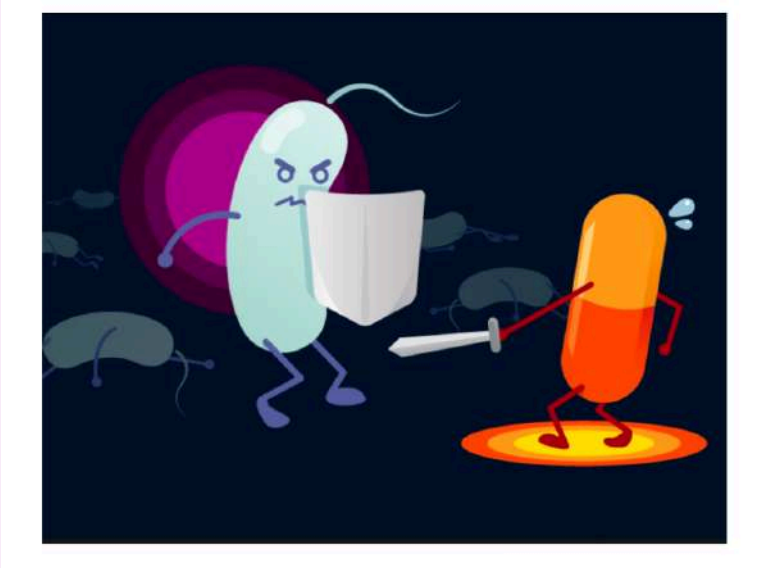
- Balanced diet: Include plenty of fibre-rich foods such as whole grains, legumes, fruits, and vegetables
- Fermented foods like Yogurt, kimchi, and other probiotics and prebiotics help to support microbial diversity.
- Limit unnecessary use of antibiotics and other drugs: Overuse can disrupt the microbiome balance.
- Always Stay hydrated: Adequate water intake supports digestion and microbial health.
- Lifestyle factors: Regular physical activity, stress management, and adequate sleep also contribute to gut health.

Conclusion: Drug microbiomes play an important role in drug effects. Their interaction with the drug is bidirectional. The microbiomes can be affected not only by the antibiotics but also by other drugs. Even though they often go unnoticed, these interactions may affect the efficacy and safety of the drugs.

Dr Athira MD, Lecturer

WINNING THE WAR AGAINST ANTIBIOTIC RESISTANCE: A PHARMACOLOGICAL AND SOCIETAL IMPERATIVE

Antibiotics remain one of the most transformative discoveries in the history of medicine. However, their very success has precipitated a global crisis—antibiotic resistance —which now threatens to reverse decades of therapeutic progress. The World Health Organization recognizes antimicrobial resistance as one of the top ten global public health threats of the 21st century. Overcoming antibiotic resistance is no longer solely a microbiological challenge; it is a pharmacological, clinical, behavioral, and policy-driven responsibility.



Understanding the Roots of Antibiotic Resistance

Antibiotic resistance is an evolutionary phenomenon driven by selective pressure. Inappropriate antibiotic use—such as unnecessary prescriptions, incorrect dosing, subtherapeutic duration, and widespread use in agriculture—accelerates the emergence of resistant strains. Pharmacologically, poor drug penetration, inadequate tissue concentration, and irrational fixed-dose combinations further compound the problem. Resistance mechanisms, including enzymatic degradation (β-lactamases), target modification, efflux pumps, and biofilm formation, are now alarmingly widespread

Rational Antibiotic Prescribing: First Line of Defense

The cornerstone of combating resistance lies in rational antimicrobial therapy. Antibiotics must be prescribed only when there is clear evidence of bacterial infection, guided whenever possible by culture and sensitivity data. Empirical therapy should be promptly de-escalated based on microbiological results. Dose optimization—ensuring appropriate loading doses, correct dosing intervals, and adequate treatment duration—is a pharmacokinetic and pharmacodynamic necessity to prevent the survival of partially resistant organisms.

Antimicrobial Stewardship Programs (ASP): From Policy to Practice

Institutional Antimicrobial Stewardship Programs play a pivotal role in regulating antibiotic use. These programs integrate pharmacologists, clinicians, microbiologists, and infection control teams to monitor prescription patterns, restrict high-end antibiotics, and promote guideline-based therapy. For postgraduate trainees, stewardship initiatives offer a unique opportunity to translate pharmacological principles into bedside practice.

Strengthening Infection Prevention and Control

Resistance flourishes where infection spreads unchecked. Strict adherence to infection control measures—hand hygiene, sterilization protocols, isolation of patients harboring resistant organisms, and surveillance of hospital-acquired infections—reduces antibiotic consumption and limits the dissemination of resistant strains.

Revitalizing Antibiotic Research and Drug Development

From a pharmacological standpoint, innovation is urgently required. Investment in novel antibiotic classes, β-lactamase inhibitors, bacteriophage therapy, antimicrobial peptides, and host-directed therapies must be encouraged. Equally important is the rational repurposing of older antibiotics using modern PK–PD modeling to maximize efficacy while minimizing resistance.

Education and Behavioral Change: The Human Factor

Antibiotic resistance is fueled as much by human behavior as by microbial genetics. Continuous education of healthcare professionals, patients, and the public is essential. Patients must be counseled against self-medication, incomplete courses, and the demand for antibiotics in viral illnesses. For pharmacologists, teaching rational drug use is both a professional duty and a moral obligation.

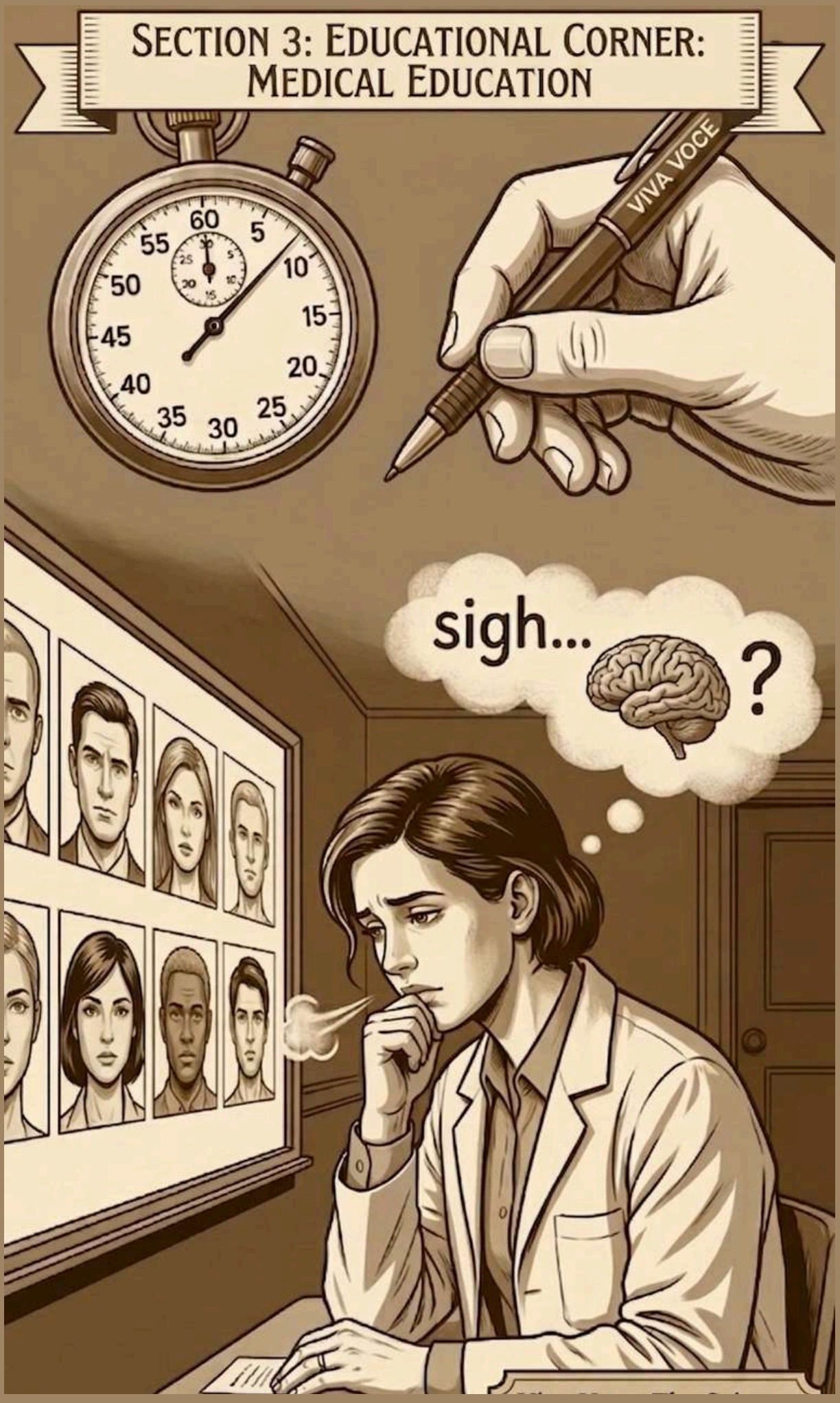
Regulatory and Policy Interventions

Effective regulation of antibiotic sales, particularly the elimination of over-the-counter availability without prescription, is critical. National treatment guidelines, surveillance networks, and alignment with global action plans such as the WHO Global Action Plan on Antimicrobial Resistance provide a framework for coordinated action.ins far more effective than treating them with increasingly limited therapeutic options.

Overcoming antibiotic resistance demands a multidimensional and sustained approach. As pharmacologists, we occupy a strategic position at the interface of drug development, clinical application, and education.

By promoting rational antibiotic use, supporting stewardship efforts, advancing research, and fostering awareness, we can preserve the efficacy of these life-saving drugs for future generations. The fight against antibiotic resistance is not optional—it is a professional, ethical, and societal imperative.

Dr Sruthi CL,
JR3


SECTION 3: EDUCATIONAL CORNER:
MEDICAL EDUCATION
VIVA VOCE
sigh...
?

Viiva Voce: The Science and Sighs

“A good archer is not known by his arrows but by his aim." Thomas Fuller

Viva voce has its origin in medieval Latin with its literal translation meaning “with the living voice” when it was proposed to be an adverb in 1579. In the context of assessment, it is an oral examination where the answers are expressed as spoken words. This assessment method is expected to explore knowledge, understanding, and problem-solving abilities. While we get a quick glance of the breadth and depth of a student's knowledge, we tend to look into the confidence, self-awareness, empathy, professionalism, and presence of mind when the student is in the hot seat. While language barriers are mostly not a criterion for awarding marks, effective communication skills always tend to make a positive impact on the assessor.

The advantages of viva voce include real-time testing of knowledge limits, allowing for carefully crafted follow-up questions that reveal decision-making skills and the rationality with which practical questions are solved. It gives the assessor an opportunity to watch the students build upon their comprehension of the subject and defend their professional decisions while getting a glimpse of some translational behavior that could be expected of a medical student in practice.

In the Kerala University of Health Sciences summative exams, 20 out of 100 (the rest 80 for practicals) for the undergraduates and 80 out of 100 (the rest 20 for thesis viva + an additional 300 for practicals) for postgraduates in pharmacology are assigned to viva-voce. Despite playing an important role in the current assessment of learning, the problems attached with viva voce are immense, including the lack of objectivity and subjectivity hindering the standardization of results. The halo effect and the horn effect seen with the human mind attached biases in evaluation, poor reliability due to language and communication barriers, and impeded performances due to candidate anxieties, mental fatigue, or I don't care attitudes pose a question in the mind of the earnest evaluators.

While the hawk-dove characterization of the examiners transformed as stringency versus leniency is very common across disciplines and in the discipline, it is difficult to transcend and appreciate the well-prepared student from the anything-will-do-attitude students. While assessment drives learning and it is expected to deliver immediate feedback to both the learner and the teacher, the anything-will-do attitude curbs the essence of this tool. All these add up to making viva voce a subjective educationally less profitable tool.Pope WBD has stated that “Oral examination format should continue only if there are efforts by the examining board to 'review, improve, and educate itself... striving always for greater objectivity and... validity.'"

To bring in more elements that could increase the reliability and validity of a viva voce is challenging, yet standardization of sets of questions after expert opinions and piloting is one way forward in improving reliability and validity. One approach that could tackle favouritism and bring in uniformity in assessment could be using the same sets of questions from a bank of standardized questions for a particular set of students; however, we need to ensure that there is no interaction amongst the students who have been assessed and who are yet to be assessed on that day.

Structured viva cards decrease subjectivity, bias, and inconsistencies attached to traditional viva. Starting from a simple recall question to break the ice, well-prepared structured viva cards can consist of several probing follow-up questions based on the answers of the students. By allowing flexibility of students in answering at different levels, the students will get satisfaction of performing yet know why their scores tend to hover low or high based on the track of questions they decide to answer. The effort and homework to be done by the faculty in the initial stage are immense, yet rewarding. There needs to be a constant working team of experts to ensure that questioning of rote learning, which tests the knowledge domain in its lowest level of Bloom’s

taxonomy alone is not happening in the viva voce.
Another key factor why viva voce remains skeptical is the time devoted for it in the summative exams. Citing mental fatigue of the students, time shortage, and ease of examiners' viva voce as a tool of assessment is underutilized or misused. There needs to be equal time and opportunity for all the examinees as well as the examiners. The quarter model of assessment is being ensured at the KUHS level in viva voce, where the student is individually assessed by 4 different examiners, ensuring fair play.

My personal sighs on Viva Voce

I fairly recollect only a few viva voce sessions during my MBBS times. Specifically, I remember those conducted frequently in Microbiology, we used to sit on the steps of our college waiting for our turn. One specific viva I remember a keen 'padipist,' now obviously a cardiologist, saying that Mary madam will ask a few questions, and then we can give leading answers based on which madam would ask more questions. So when my turn came, I went inside and started saying whatever I knew irrespective of the question being asked, and within a few minutes I was out with madam warning me she wanted specific answers to the questions she asked and not what I wanted to answer. I understood that tricks can work with only those who "know" the subject.

The next explicit remembrance is the summative exam of Pharmacology, on the very verandah that I daily walk before reaching my room in GMCK, after my viva exam, I stood on my knees and vowed that I would never walk into that department. And yet, the irony of life: man proposes, God disposes. I still remember my Ophtalmology viva when I said that atropine was a miotic and Shobhana madam's wide eyes getting wider.

During my postgraduate summative exam viva voce, I remember that day very well; blank and drained, I sat before my examiners, luckily with my theory answer sheets before them(as there was no centralized valuation at that time). I remember my external examiner, Alwar sir, astonishingly asking me, "Did you write these answers?" He was also specifically pointing to a mistake in my Sumatriptan mechanism of action in which I got confused about whether it was a 5HT1B/1D agonist or antagonist. Seeing my plight, Ramani madam told me to say “I don't know” if I am unsure of an answer so that the examiners can proceed to the next question. Then for the rest of the upcoming questions, I said, "I don't know." I still remember the embarrassed faces of my internal examiners. That was an eye-opening experience in life. All days are not fair, however well we prepare, and now I understand the importance of programmatic assessment, which emphasizes relying on point-to-point assessments rather than a single summative certifying assessment.

As an examiner, I always enjoy asking questions. Over the years I have shifted from recall questions to asking rationales and from asking rationales to practical scenario-based application-level questions. There have been moments of laughter when, on cue, a student answered “Sumi” instead of “Suma” while discussing triptans. There have been moments of tears of joy when I was specifically moved by the answers of Dr. Surya of the 2017 batch, by her depth of understanding and way of answering. There have been moments of anger and resentment when our students take it for granted, sit before us as if it were a ritual, and go back unaffected while I try to find what went wrong with my guidance.

Dr S P Dhanya
Professor CAP, Pharmacology
Member, NMC Nodal Centre for Faculty Development
Member, Antimicrobial Stewardship Committee

Section 4

LITERARY CORNER

IF DRUGS COULD SPEAK: A BETA BLOCKER'S RESTRAINTS

I arrive without drama
No urgency, no insistence-only presence...

The body is already loud when I enter
Messages outrun themselves
Adrenaline speaks in sharp, breathless tones, leans into β_1 receptors,
convincing the heart that every moment is a crisis.
The pulse accelerates,
The walls constrict,
Rhythm forgets how to rest.

I do not argue
I do not compete with the noise
I simply stand in the way.

At the receptor-where urgency usually knocks-I take my place.
I do not activate,
I do not destroy,
I wait; quiet and deliberate.
And in that waiting, something subtle unfolds.
The cascade softens,
cAMP rises less insistently,
Calcium enters with restraint,
The sinoatrial node pauses before it speaks again.
The heart hears something unfamiliar: not command, but permission.

Permission to slow,
Permission to beat with intention rather than fear.
The heart responds-not because it is forced to, but because it remembers how!

As I move through vessels narrowed by constant vigilance,
I soften the conversation there as well.
Pressure eases its grip,
Resistance loosens its hold,
Balance replaces strain,
The circulation remembers that flow need not be forceful to be faithful!

Sometimes, I am called to a trembling body,
hands unsteady, breath shallow, chest tight with unsaid worry.
I do not enter the mind, I have no language for memory or thought.
But I quiet the body's noise,
and in that silence, the mind often finds its own peace.
When the body stops shouting, the soul can finally listen...

I know my limits.

I am not meant for every heart.
In lungs already struggling for breath, my presence may feel heavy.
In hearts already slow, my gentleness may become too much.
I rely on discernment-on clinicians who understand that even calm must be chosen carefully.

I do not cure.
I do not erase disease.
I do not undo what has already been wounded.

I change how the wound is carried.
I teach the body that not every signal deserves obedience.
That strength is not always acceleration,

That survival does not always mean pushing forward-sometimes, it means holding back.

By the time I am broken down and cleared away, I leave little evidence of myself behind.
No trace, No triumph; Only a quieter rhythm, a softened pressure
A system reminded that steadiness, too, is a form of healing.

If drugs could speak, perhaps this is what I would say:

Healing does not always arrive as repair
Sometimes, it arrives as understanding.

And maybe that is what healing truly is-
not erasing the wound,
but changing how it lives within us!

Dr Neethu Soman
Assistant Professor, Pharmacology,
Member, KUHS Accreditation Committee

Mr.ATROPINE'S QUIET WALK

On one fine day, Mr. Atropine woke up with exhaustion after his busy, hectic work of years.
He couldn't open his eyes fully due to dryness that blurred his vision of reality; once he tried opening his mouth for yawning too, it was difficult because of dry, chapped lips.

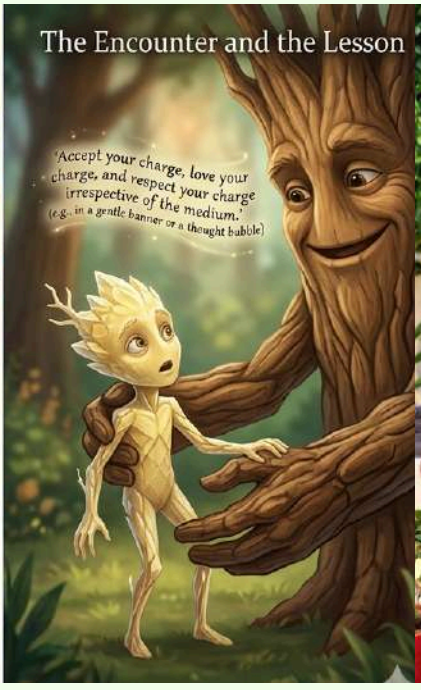
With a trembling heart, which was pounding more than ever before, and a chaotic, confused mind, he thought a bath & walk may do good at present.

After a bath, with nice clothes, he stepped out of the room & went for a simple walk down the lane.
Plants are blooming, swaying in a mild breeze; birds are chirping with heart-full love. He paused for a while. Where am I lacking my "self"...? While thinking, he started walking, but he accidentally stumbled over a root that was over the mud.

Hey bro...watch your foot & he saw a broad, strong hand of a willow bark with a confident smile...
Yeah! "Thank you...I'm saved," Mr. Atropine replied.

With pleasure, Mr. Willow mentioned...that time by some chit-chat our Atropine stood there as if he had someone who was more confident & pleasant than him. He was in a world of wonder. On understanding this, our Willow said, "Hey, dear, all these are just a matter of our decision to stay grounded (strong acid/base stands with their charge in any medium) & stand up for your right (strong acid/bases wont make salts with other ions)."

"Accept your charge, love your charge, and respect your charge irrespective of the medium."



Dr Eva John, Jr3

My Reflection

You are the mirror I never feared standing before.

In your eyes, I meet my unguarded self-

the cracks, the courage, the quiet ache.

When I forget who I am,

you hand me back my own reflection

with such tenderness

that even my flaws feel worthy of love.

You do not change me.

You remind me.

And somehow, in your steady light,

I find my way home to myself.

Dr Abey Abraham Joy, JR3

A LETTER TO SELF IN LOVE WITH PHARMACOLOGY

Dear,

As we all know, each cell in our body is equipped with tons of unique qualities, or so-called mechanisms, to make miracles by working together. They help us to fight or protect us from everything new coming, either passively without need of energy or actively by sourcing our consent as energy, which may harm, remain a blessing in disguise, or make us evolve. Being privileged as a Pharmacologist let us find out more efflux pumps to decrease the available concentration of xenobiotics to get a clear insight to unravel hidden new pathways & potentials to rebuild new molecules & yourself.

With love

Dr. Eva John

Kottayam.

WHEN BREATH BECOMES AIR - MY BOOK REVIEW

That message is simple. When you come to one of the many moments in life when you must give an account of yourself, provide a ledger of what you have been, and done, and meant to the world, do not, I pray, discount that you filled a dying man's days with a sated joy, a joy unknown to me in all my prior years, a joy that does not hunger for more and more, but rests, satisfied. In this time, right now, that is an enormous thing.

These are excerpts from the book titled- 'When Breath becomes Air' ,an autobiographical novel about a brilliant neurosurgeon who was diagnosed with terminal cancer at the peak of his career. This poignant message is for his baby daughter, Cady.

Back in my schooldays I was a voracious reader. However when preparing for medical exams and pushing myself through medical school, reading took a back seat. It was in medical school that I met Swadha, one of my best friends-cum neighbour who inspired me to take up reading again. Her dorm room was essentially a library where I had the fortune to come across the accomplished works of many author which deeply impacted me.

One day, she handed me over a white paperback book bearing a name of an author I have never heard before- Paul Kalanithi. Little did I know that that book would take me on an emotional roller-coaster ride.

A brilliant neurosurgeon who was on the threshold of embarking on the glorious career he had worked so hard for had fallen prey to natures' cruel destinies.

It was in my third year that my dad was diagnosed with terminal cancer. My father was a quiet, soft spoken, deeply religious man who was an epitome of patience. Cancer stole this beautiful man and I watched helplessly as he writhed on the hospital bed not able to contain the pain in the last few weeks of his life. I felt his pain, (though it is of course nothing compared to what he was going through), I wept for him, I wept with him. So the words of Kalanithi reflecting his pain and struggles in this cancer riddled new life - struck home. Though I was prepared to be moved, what makes Kalanithis book a one in a million is his exquisite talent at story telling. Paul was a student of literature and medicine before he turned his focus to medicine and that reflected in the way he engaged with words - with exquisite precison.

The book starts with revealing his dark diagnosis of metastatic lung cancer. Though scans say a different story Paul still has hope and wonders how the tables have changed. At the very ward where he treated patients, he was being treated as a patient. In the background, he describes his early life of growing up in Arizona, child of Indian- American parents. It follows up with his decision to take medicine for he felt that the questions intersecting life,death and meaning usually arise in a medical context.

Interspersed with the many medical descriptions we find amazing quotes, some quoted and some beautiful observations by himself.

"There is a moment, a cusp, when the sum of gathered experience is worn down by the details of living. We are never so wise as when we live in this moment."

His take on life in general as a patient with only weeks to live reminds us to live life in the moment, in every breath we take. And so, his book remains to be one of the few which I love to read again and again. He is survived by his wife, his daughter and parents yet I feel that what he has truly left behind is a legacy. Recommending this book for anybody and everybody who wants a fresh, new and raw take on the meaning of life.

Dr. Sherin Koloth
JR2 Pharmacology

...THE TROUGH & PEAKS.....

Life is a learning curve.
plotted with experiences versus lessons

Some like loading doses
Some like a maintenance dose.

Whatever it may be,
trough or peak
Dont let experiences accumulate in the cells of your soul

Rather make it flow through you
Reflecting the lessons to enhance the steadiness of activity in your life.

Dr Eva John, JR3

PHARMACOGENETICS

Across the moving earth we stand.
billions breathing, formed of fleshs with unique code,
walking one shared human road.

The heart beating its steady rhyme,
lungs dancing with air and time,
neurons spark in silent streams
Intestines dancing with loops
Progenies are ready to come out
Hormones are helping the way out
a common body with woven dreams.

Yet deep within, are the sequences.
the hidden scripts of genetics
where no eye can spy,
a subtle shift, a single change
rewrites the way our lives are led.

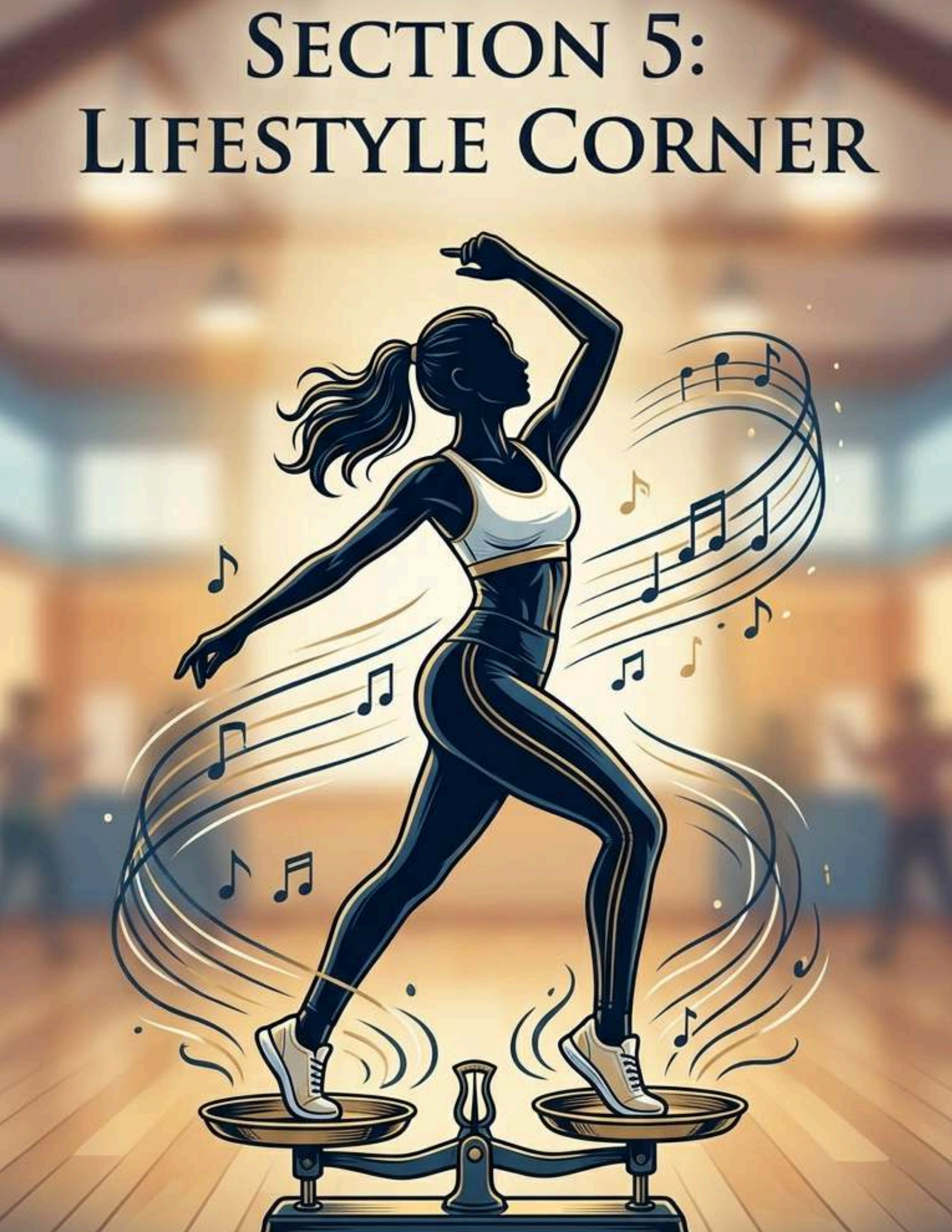
The same drug flows through every compartment,
yet heals in one.
Identical paths, yet never the same,
each responds in a different magnitude.

From coded strands the diversity blooms.
infinite ways the body knows
to fight, adapt, resist, renew–
a universe within each "you."

Science listening to these soft genetic rhymes.
crafting cures with precision
where medicine meets the soul of you.

A pharmacologic symphony spun,
Many expressions... yet all are one!!!

Section 5: Lifestyle Corner



DANCE YOUR WAY TO HEALTH: THE MAGIC OF ZUMBA FOR WEIGHT MANAGEMENT

Introduction

Maintaining a healthy weight and staying physically active are essential for overall well-being. However, many people struggle to follow strict workout routines because they feel monotonous and tiring. Zumba offers a refreshing alternative. It is a lively dance-based fitness program that combines energetic music with easy-to-follow dance movements, transforming exercise into an enjoyable activity.

With its vibrant rhythms and group energy, Zumba helps people stay active while having fun, making it one of the most enjoyable ways to maintain weight and improve health.

What is Zumba?

Zumba is a dance fitness program that blends Latin and international music with aerobic exercise movements. The workout feels more like a dance party than a traditional exercise session.

Why Zumba is Effective for Weight Maintenance

One of the main reasons Zumba is popular is its ability to burn calories while keeping participants motivated. The continuous movement and high-energy dance routines increase heart rate and improve metabolism.

Regular Zumba sessions can help:

·Burn calories efficiently

·Improve stamina and endurance

·Reduce body fat

·Maintain a healthy body weight

Because it feels enjoyable rather than strenuous, many people stay consistent with their routine, which is key to long-term weight management.

Benefits of Zumba for Overall Health

1. Improves Cardiovascular Fitness

Zumba involves constant rhythmic movement, which strengthens the heart and improves circulation.

2. Enhances Muscle Tone

Dance steps involve the arms, legs, and core muscles, providing a full-body workout.

3. Reduces Stress

The combination of music and movement releases endorphins, helping to relieve stress and elevate mood.

4. Improves Coordination and Flexibility

Following dance steps improves balance, coordination, and body flexibility over time.

The Power of Group Energy

Exercising with others creates enthusiasm and motivation. Participants encourage each other, making workouts enjoyable and socially engaging.

Who Can Do Zumba?

The beauty of Zumba is that it is suitable for almost everyone, regardless of age or fitness level.

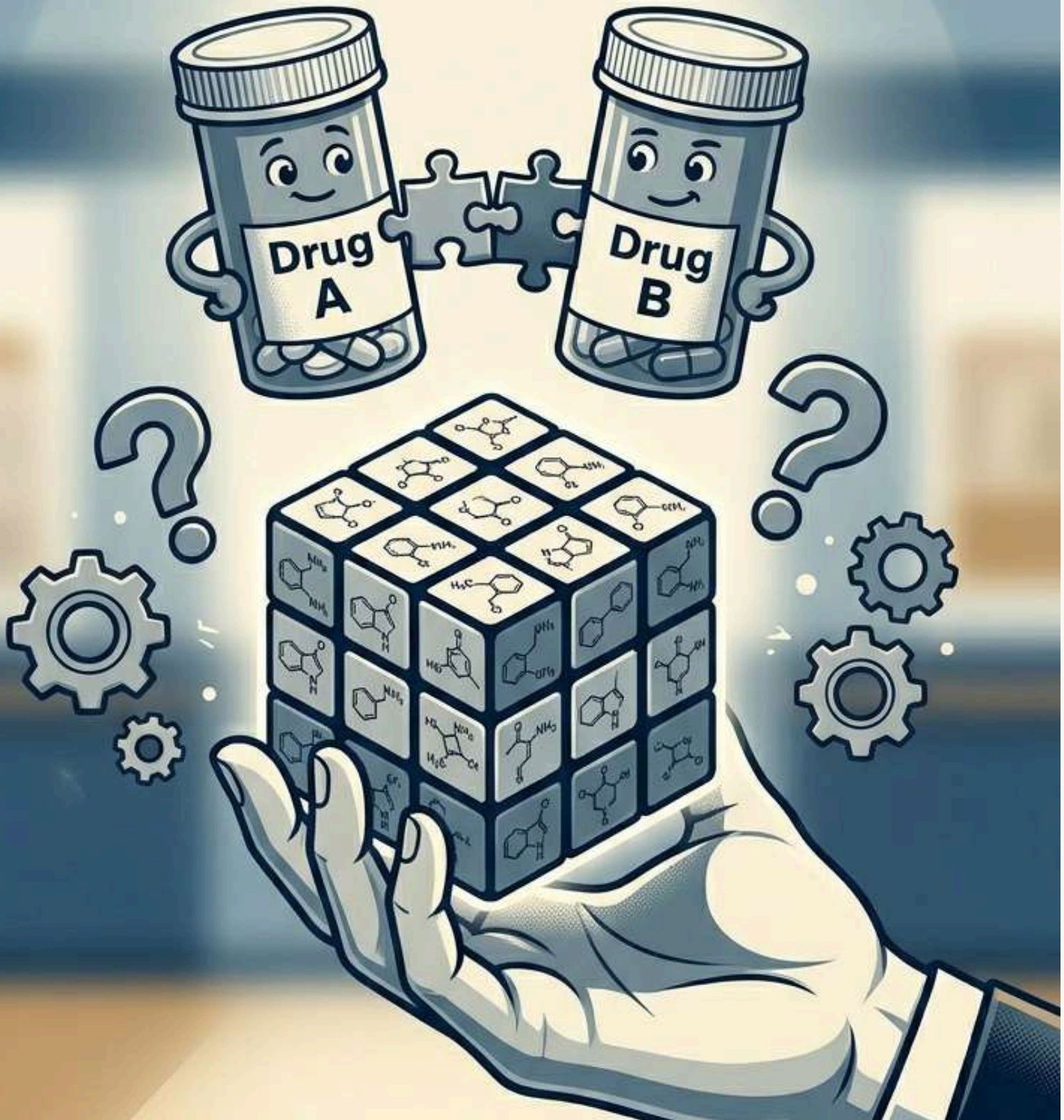
Conclusion

Zumba makes staying fit enjoyable by combining dance, music, and exercise into one energetic activity. Regular participation can help maintain body weight, improve physical fitness, and boost mental well-being.

Zumba is more than just a workout—it is a joyful way to stay active, healthy, and energized.

Dr Anila E Mathew,
Lecturer

Section 6: Brain Teasers



UNSCRAMBLE THE DRUGS

LIBCARITUS

ZONACORIVLOE

ACIRATGRELOR

ZNOAMIDO

SDMEERIVIR

GZLEMPAIFLOIN

ZMLAUOMBAI

NARTINIGECOLYR

TIBIRACINB

LUMADUBPI

ABRTAERNOEI

Unscramble the names of different drugs give above and find the answer for the picture.

Clue: Use the alphabets in the red circles to find the answer.

Saxubitil, Voriconazole, Ticagrelor, Ozanimod, Remdesivir, Empagliflozin, Omalizumab, Nitroglycerin, Baricitinib, Dupilumab, Abiraterone, Tirzepatide

Dr Neethu Mohan
Senior Resident

DRUG INTERACTIONS RIDDLES

I am the morning fruit that turns a cure into a curse,
Beside me sits a bottle, a heart's loyal friend,
To keep the rising lipids from a dangerous trend.
I stop the breakdown of your pill and make the side effects much worse.
What is the name of the interaction that happens in this sight?

Answer: The inhibition of Cytochrome P450 3A4 (CYP3A4) by grapefruit leading to increased plasma concentrations of Atorvastatin and a higher risk of myopathy or rhabdomyolysis

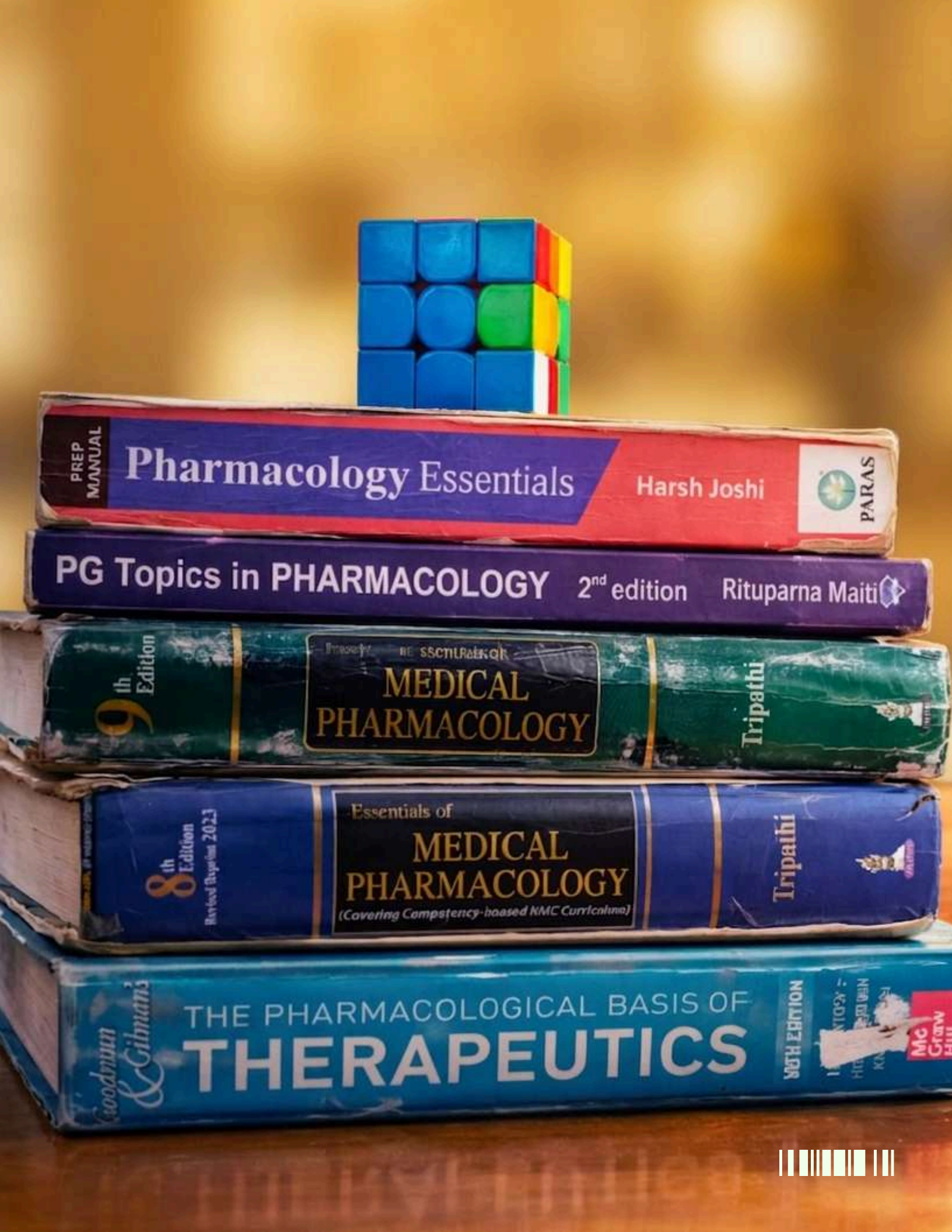
A vibrant green mountain, a feast for the eye,
Of Kale and of Spinach where nutrients lie.
Beside it, a bottle, a thin, steadying force,
To keep the red river on its fluidic course.
But a silent commander is hidden in the leaf,
Bringing the Warfarin to a sudden, sharp grief.
What is the name of this emerald tug-of-war?

Answer: High intake of Vitamin K facilitates the synthesis of clotting factors, directly opposing Warfarin's mechanism and lowering the INR (International Normalized Ratio), which increases the risk of a blood clot.

I am the amino acid that aged foods provide;
With no enzyme to stop me, I've nowhere to hide.
I'll flood through your system and make your heart race,
Sending your blood pressure to a dangerous place.
What is the name of this "Effect" fright?

Answer: The Hypertensive Crisis caused by the interaction between Tyramine (found in aged/fermented foods) and Monoamine Oxidase Inhibitors (MAOIs). Because MAOIs inhibit the enzyme responsible for breaking down tyramine, levels spike, leading to a massive release of norepinephrine and a potentially fatal rise in blood pressure.

AI generated riddles and images compiled by Dr S P Dhanya


PREP MANUAL
Pharmacology Essentials
Harsh Joshi
PARAS
PG Topics in PHARMACOLOGY
2nd edition
Rituparna Maiti
9th Edition
MEDICAL PHARMACOLOGY
Tripathi
8th Edition
Essentials of
MEDICAL PHARMACOLOGY
(Covering Competency-based MMC Curriculum)
Tripathi
Goodman & Gilman's
THE PHARMACOLOGICAL BASIS OF
THERAPEUTICS
14TH EDITION