

# PHARMA TAB



Department of Pharmacy Practice  
**C.L. BAID METHA COLLEGE OF PHARMACY**  
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## ARTIFICIAL INTELLIGENCE: TRANSFORMING THE PRACTICE OF MEDICINE

Artificial intelligence (AI) has revolutionized the healthcare industry by reshaping the way we diagnose, treat and monitor patients. This technology, drastically enhancing healthcare research and outcomes by producing accurate diagnoses, make more informed decisions based on more accurate information and thus enabling more personalized treatments

By using artificial intelligence in hospital settings and clinics, healthcare systems can become smarter, faster, and more efficient in providing care to millions of people worldwide. Though the applications are wide range, the challenges including ethical and regulatory issues must be addressed. Data privacy and security, patient safety and accuracy are the most important concerns. Gaining acceptance and trust from health care providers and integration into everyday clinical practice is the primary obstacle for AI in healthcare. But, the future of using artificial intelligence in healthcare is undoubtedly bright and filled with possibilities for further innovation. current issue consists of articles focusing on artificial intelligence in field of pharmacy practice and has all our regular features. Hope it will be interesting to read.

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## DRUGS APPROVED BY US FDA

Drugs Approved by US Food and Drug Administration (US FDA) during the period of April to June 2024

Drug Name	Approved Date	Indication	Status in India
Ceftobiprole medocartil	03/04/2024	To treat bacteremia, skin infection, and pneumonia	Not yet approved in India
Nogapendekin alfa inbakicept-pmln	22/04/2024	To treat bladder cancer	
Tovorafenib	23/04/2024	To treat low-grade glioma	
Mavorixafor	26/04/2024	To treat WHIM syndrome (warts, hypogammaglobulinemia, infections and myelokathexis)	
Tarlatamab-Dlle	16/05/2024	To treat extensive stage small cell lung cancer	
Clonidine hydrochloride	24/05/2024	To treat Attention-Deficit/Hyperactivity Disorder (ADHD) in children	
Imetelstat	06/06/2024	To treat myelodysplastic syndrome	
Elafibranor	10/06/2024	To treat primary biliary cholangitis	
Vigabatrin	17/06/2024	To treat infantile spasms	
Sofpironium	18/06/2024	To treat hyperhidrosis	
Crovalimab-akkz	20/06/2024	To treat paroxysmal nocturnal hsemoglobinuria	
Ustekinumab-ttwe	28/06/2024	To treat plaque psoriasis, psoriatic arthritis, crohn's disease, ulcerative colitis	

Source: <https://www.fda.gov/drugs/novel-drug-approvals-fda/novel-drug-approvals-2024>

## UPCOMING CONFERENCES

**Faculty Development Program** on theme "Fostering Resilience in Domains of Parma research" organized by C L Baid Metha College of Pharmacy, Thoraipakkam, Chennai on 12-13 August 2024.

**International Conference** organized by CL Baid Metha College of Pharmacy, Thoraipakkam, Chennai on 30-31 August 2024,

**Two Days National Seminar** on Emerging Trends in Clinical Pharmacology Research and Pharmacy Practice organized by JSS college of Pharmacy, Ooty, on 13-14 September 2024.

## GLOBAL EVIDENCE SUMMIT 2024

### TDR stipends available

Global Evidence Summit is a unique opportunity to get involved in evidence-based practice, with a shared mission to provide a platform to discuss critical issues across different sectors, including health, education, social justice, the environment and climate change

The event will take place in Prague, Czechia, from 10-13 September 2024.

TDR is offering a limited number of scholarship (funding you can apply for if eligible) to help cover registration, travel, accommodation, and/or other expenses, associated with attending the Global Evidence Summit 2024.

For details: <https://tdr.who.int/grants>



## IMPORTANT HEALTH AWARENESS DAYS

(July - September 2024)

HEALTH DAYS	DATE
Doctors Day	01 July
World Hepatitis Day	28 July
World Lung Cancer Day	01 Aug.
World Suicide Prevention Day	10 Sept.
World Alzheimer's Day	21 Sept.
World Pharmacists Day	25 Sept.
World Rabies Day	28 Sept.
World Heart Day	29 Sept.

## INSIGHTS FROM INDIA

# INCORPORATING AI AND TECHNOLOGY INTO PATIENT CARE

In recent years, India has witnessed a remarkable integration of technology into healthcare, revolutionizing patient care practices across the nation. This transformation has been particularly fuelled by the advent of Artificial Intelligence (AI) applications in healthcare settings. In many parts of India, there are still no adequate medical services. Technology can be helpful in this situation, especially when it comes to connecting with rural areas and providing higher-quality care at a more affordable price. Telemedicine is the practice of diagnosing and treating patients from a distance using communication networks. Let's delve into the applications of AI in India's healthcare landscape, along with the challenges accompanying its implementation.

India faces significant challenges in its healthcare system, including quality, accessibility, affordability, and inequity. While some of the best hospitals contribute to medical tourism, there is an acute shortage of qualified medical professionals, especially in rural areas. Government spending on healthcare is low, and most Indians rely on private health providers, which are often fragmented and unregulated. Affordability remains a concern, with high out-of-pocket expenses for patients.

## Current Status of Technology in Indian Healthcare

AI adoption is still at an early stage, particularly in clinical interventions. Many of these issues could be resolved with the use of new machine learning (ML) or other artificial intelligence (AI) technologies. These issues include increasing access to high-quality healthcare, especially in rural and low-income areas; resolving the unequal ratio of physicians to patients; enhancing the efficiency and training of medical professionals, especially when performing complex procedures; and facilitating the large-scale provision of personalized healthcare. "The in-

creased advances in technology, and interest and activity from innovators, provide an opportunity for India to solve some of its long-existing challenges in providing appropriate healthcare to a large section of its population," according to the recently released draft National Strategy for Artificial Intelligence in India (NITI Aayog, 2018a).

As stated in the most recent policy documents for the National Health Stack (2018) (NITI Aayog, 2018b) and the National Digital Health Blueprint (2019) (NDHB) (Ministry of Health and Family Welfare, 2019), the government is also working to establish a national digital health infrastructure. The Health locker—an electronic national health registry and cloud-based data storage system that would act as the country's single source of health data—as well as a federated personal health records (PHR) framework, a national health analytics platform, a coverage and claims platform that would support large health protection schemes, and a unique digital health ID for each citizen are some of the key components of this digital infrastructure.

Aarogya Setu App Initially launched for COVID-19 contact tracing, it has evolved into a National Health App integrated with ABDM. It allows users to register for a Digital Health ID and access digital lab reports, prescriptions, and diagnoses. The pandemic

accelerated the adoption of telemedicine, with reports indicating that 80% of doctors in North India, 50% in Southern and Western regions, and 35% in East India adopted telemedicine during the pandemic. This has enabled patients in remote areas to access quality healthcare services. Innovations in wearable technology equipped with advanced sensors are enhancing patient monitoring and care management. The emergence of IoT in healthcare is promising, with potential applications in patient monitoring, data analytics, and improving healthcare delivery.<sup>(1)</sup>

## Applications of AI in India:

**1. Diagnostic Assistance:** AI can analyze medical images, such as X-rays, MRIs, and CT scans, to identify abnormalities swiftly. Algorithms compare these images to vast databases of similar cases, providing valuable insights for healthcare professionals. AI implementation in the medical sector evaluates massive amounts of treatment and patient data. By analyzing previous medical records, doctor reports, and other relevant information, AI offers assistance and recommen-



Source: [www.grandviewresearch.com](http://www.grandviewresearch.com)

dations to clinicians. This speeds up and improves the overall treatment procedure.

In the future, “smart laboratories” may emerge, utilizing robots for repetitive tasks, intelligent decision – making, and data-driven predictions. These labs will enhance diagnostic accuracy, reduce treatment time, and increase access, especially in underserved areas.

**2. Predictive Analytics:** Predictive analytics models utilize AI algorithms to forecast disease outbreaks, patient admissions, and treatment responses. In India, these models help healthcare providers allocate resources effectively, anticipate healthcare needs, and devise preventive strategies, especially in rural and underserved regions.

**3. Personalized Medicine:** AI-driven platforms are enabling personalized treatment plans tailored to individual patient profiles. By analyzing vast datasets, including genetic information and medical history, AI algorithms recommend the most effective treatments with minimal side effects, optimizing patient outcomes.<sup>(2)</sup>

**4. Telemedicine:** The technology utilized in telemedicine, which allows doctors and patients to be almost anywhere, is one of the most important factors in providing people in need with access to high-quality healthcare. Distance is no longer a barrier to healthcare access in rural areas because to the emergence of telemedicine. AI-powered telemedicine platforms facilitate remote consultations and monitoring, bridging the gap between patients and healthcare providers, particularly in remote or rural areas. These platforms offer real-time health monitoring, virtual consultations, and medication management, improving access to healthcare services.<sup>(3)</sup>

**5. Healthcare Management:** AI is streamlining administrative tasks and enhancing operational efficiency in healthcare facilities. From appointment scheduling to inventory management, AI-driven systems automate routine tasks, reducing human errors and minimizing wait times for patients.

### Challenges in Adopting Technology in India:

**1. Data Quality and Privacy:** Limited availability of high-quality healthcare data and concerns regarding patient privacy pose significant challenges to AI implementation in India. Ensuring the security and confidentiality of patient information, while complying with data protection regulations is crucial for building trust in AI-driven healthcare systems.

**2. Infrastructure and Connectivity:** Inadequate infrastructure and unreliable internet connectivity in remote areas hinder the widespread adoption of AI-powered healthcare solutions. Addressing infrastructural gaps and expanding digital infrastructure are imperative to ensure equitable access to AI-enabled healthcare services across India.

**3. Skill Gap:** The shortage of skilled professionals proficient in AI technologies and healthcare domain knowledge impedes the effective utilization of AI in Indian healthcare. Investing in training programs and interdisciplinary

collaborations to build a workforce skilled in AI and healthcare is essential for maximizing the benefits of AI in patient care.

**4. Regulatory Framework:** The absence of a comprehensive regulatory framework specific to AI in healthcare poses regulatory challenges and uncertainties. Developing clear guidelines and standards for the development, deployment, and evaluation of AI applications in healthcare is essential to ensure patient safety and ethical use of AI technologies.

**5. Affordability and Accessibility:** Cost barriers and disparities in access to AI-enabled healthcare services exacerbate healthcare inequalities in India. Promoting affordability and accessibility of AI-driven healthcare solutions, especially for marginalized populations, requires innovative financing mechanisms and public-private partnerships.

**6. Technological Adoption:** The adoption of AI and other emerging technologies has been limited, particularly in public institutions compared to private ones. Private healthcare providers, especially in urban areas, have adopted foundational technologies like HIS, ERP, and EHR more readily.<sup>(4)</sup>

### Conclusion

While AI holds immense potential to revolutionize patient care in India, addressing the associated challenges is crucial for realizing its full benefits. By fostering collaboration between stakeholders, investing in infrastructure and workforce development, and establishing robust regulatory frameworks, India can harness the transformative power of AI to deliver more efficient, equitable, and patient-centered healthcare services nationwide.

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# ARTIFICIAL INTELLIGENCE AND PHARMACY EDUCATION

**“AI will not replace you. A person using AI will”**

Artificial Intelligence (AI) and Machine Learning (ML) are closely related but distinct concepts that are essential in understanding modern technological advancements.

## Artificial Intelligence (AI)

Artificial Intelligence is described as “the theory and development of computer systems to perform tasks that normally would require human cognition, such as perception, language understanding, reasoning, learning, planning, and problem-solving.

## Machine Learning (ML)

Machine learning is a fundamental component of many AI technologies, and has used to design and train software algorithms to learn from and act on data.

## Designing Pharmacy’s Future

The COVID-19 crisis has accelerated the integration of health and technology and has been a catalyst for rapid advancements and widespread adoption of digital health solutions, transforming how we approach healthcare.

Telemedicine has surged, becoming a vital tool for providing care while minimizing the risk of virus transmission. Virtual consultations, remote monitoring, and digital diagnostics have become common place, allowing patients to receive medical advice and treatment from the safety of their homes. This shift has not only expanded access to healthcare but also demonstrated the potential for technology to enhance efficiency and patient outcomes.

In addition to telemedicine, we have witnessed the deployment of AI and machine learning in disease tracking, diagnosis, and treatment planning. AI-powered algorithms are now used to predict outbreaks, analyze medical images, and personalize treatment plans, making healthcare more proactive

and tailored to individual needs.

Visiting a pharmacy in five to ten years will likely be a significantly different experience from today, driven by technological advancements, evolving healthcare practices, and the increasing integration of digital health tools.

The pharmacy of the future will be a hybrid of digital and physical services, with pharmacists playing a central role in personalized patient care, preventive health, and chronic disease management. Preparing student pharmacists for this future involves updating educational curricula, promoting interdisciplinary collaboration, and fostering a commitment to continuous learning. By embracing these changes, pharmacists will be well-equipped to meet the evolving needs of patients and the healthcare system.<sup>(2)</sup>

## Areas of Digital Health

TOPIC AREA	DESCRIPTION
Mobile medical applications	“Medical devices that are mobile apps, meet the definition of a medical device, and are an accessory to a regulated medical device or transform a mobile platform into a regulated medical device”
Digital therapeutics	Regulated evidence-based software intervention that can be independent or complementary to other therapies.
Telehealth	“Delivery and facilitation of health and health-related services including medical care, provider and patient education, health information services, and self-care via telecommunications and digital communication technologies”
Digital biomarkers	Hardware-software based measurement of physiological data in real time for prognostic or diagnostic measurements

## AI in Pharmacy Education

In the recent years, AI has a wide range of applications in the healthcare, particularly with the introduction of digital health and electronic health records. Machine learning, also been used to provide radiologic diagnoses, clinical decision support systems, to enhance patient safety, and also in advanced diabetes management to enable customized insulin delivery based on continuous glucose monitoring.

But as these technologies have developed, health care curriculum also needs to include more instruction on artificial intelligence, in order to more easily incorporate AI into current practice settings. Healthcare education need to adapt to the ongoing integration of digital health into clinical and industry procedures.

To remain current and productive in their positions, pharmacists in particular must embrace digital health and AI integration. A plausible approach entails integrating digital health subjects into the pharmacy syllabus and strengthening digital health education via optional classes, educational tracks, and certificate programs. Master’s degrees, residencies or fellowships, and continuing education credits are examples of post-graduate opportunities.

The integration of digital health into formal education offers a novel means to engage in inter professional education (IPE) opportunities. Students across multiple professions can work together to engage in digital health discussion activities that can aim to tackle health solutions



and problems based on a technological focus and not necessarily on their clinical capabilities, while still bringing multiple views together.

Nonetheless, determining how to build out digital health education will be a topic of debate in the coming years. Although there have been certificates offered in health informatics, such as from Healthcare Information and Management Systems Society (HIMSS), digital health as a topic goes beyond their scopes.

Several medical schools are already housing centers for digital health, and it comes as no surprise that they may seek to expand these out to formal educational outputs. However, these certificates are more geared toward those with an interest in digital health and not necessarily need a health science background. This creates a limitation for health student learners from integrating their clinical knowledge sets with digital health. Conversely, creating a digital health mechanic to teach health students explicitly will be more difficult, especially considering scalability. As such, pursuing a track to digital health knowledge would likely be easier, and on a smaller scale, which is offering a track in allopathic medical school. Working to facilitate expertise, rotations, and clinical experiences will also be a rate-limiting step for programs looking to engage in digital health.<sup>(3)</sup>

### Conclusion

The adoption of AI in pharmacy education is not just an enhancement but a necessity in preparing the next generation of pharmacists. Educational institutions must continuously update their curricula

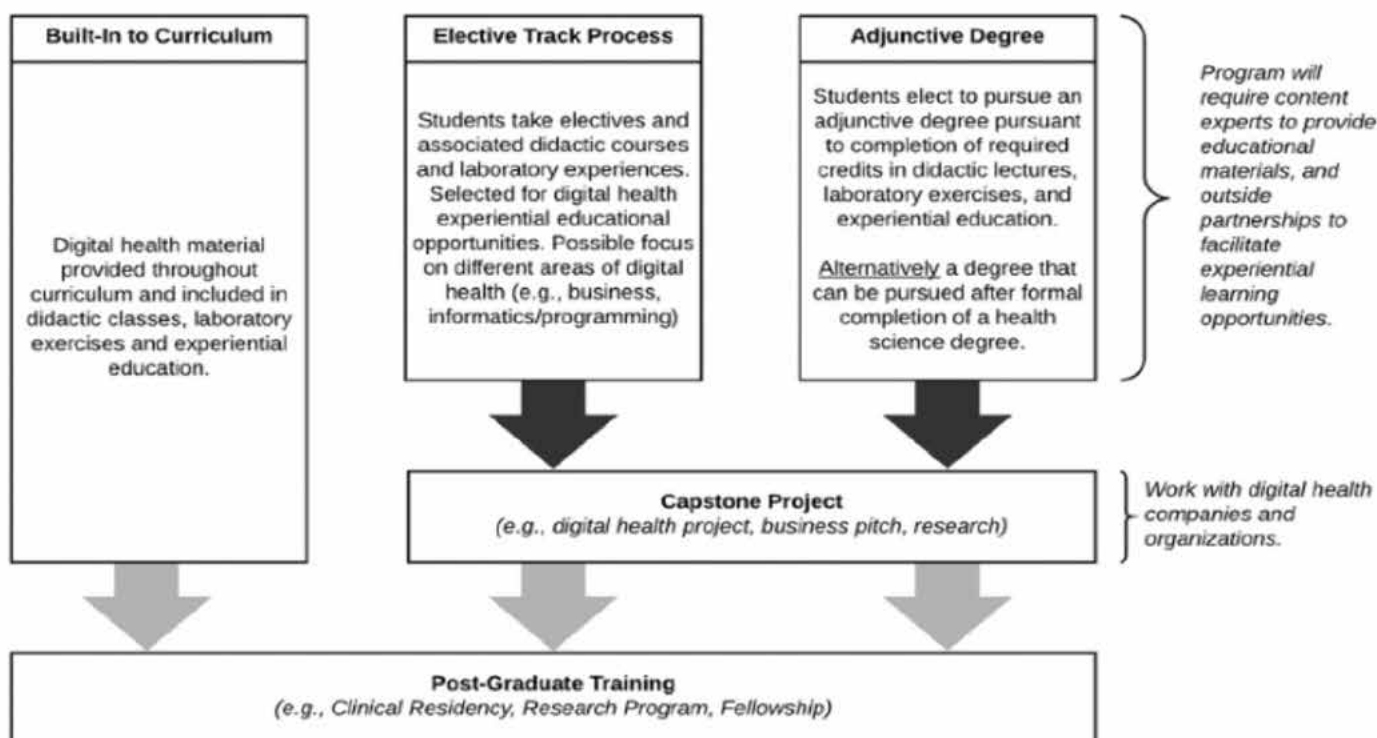
to include the latest AI technologies and applications, fostering a forward-thinking mindset among students. By doing so, they ensure that future pharmacists are not only proficient in traditional practices but also adept at leveraging AI to advance the field of pharmacy and improve patient outcomes.

In conclusion, the integration of AI into pharmacy education represents a significant step forward, providing students with the tools and knowledge they need to thrive in a technology-driven healthcare environment. This approach promises to enhance the quality of pharmaceutical care, drive innovation, and ultimately lead to better health outcomes for patients worldwide.

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### Digital Health Training <sup>(3) (4)</sup>



# AI IN PHARMACOVIGILANCE - A GAME CHANGER

The role of AI in pharmacovigilance is becoming increasingly significant as the pharmaceutical industry seeks to enhance drug safety monitoring and improve patient outcomes. With the advancement of Artificial Intelligence (AI) technology, the field of pharmacovigilance is undergoing a transformation towards more efficient data processing, real-time adverse event detection, predictive analytics, automated case processing, and natural language processing (NLP).<sup>0</sup>

## BENEFITS OF AI IN PHARMACOVIGILANCE:

**Enhanced Early Detection:** AI can identify potential safety signals earlier than traditional methods, allowing for faster intervention and mitigation of risks.

**Improved Accuracy and Efficiency:** AI can process information at a much faster pace than humans, reducing the time and effort required for data analysis.

**Proactive Risk Management:** AI can predict potential risks based on historical data and emerging trends, enabling proactive risk management strategies.

**Personalized Safety Monitoring:** AI can tailor safety monitoring to individual patients based on their medical history, demographics, and medication use.

**Reduced Costs:** By automating tasks and improving efficiency, AI can significantly reduce the cost of pharmacovigilance.

The integration of AI in Pharmacovigilance, holds great promise for enhancing patient safety, optimizing drug development processes, and ultimately saving lives. As the pharmaceutical industry continues to embrace advanced technologies, AI will play an increasingly significant role in revolutionizing the field of pharmacovigilance.<sup>(1)</sup>

AI algorithms can analyze vast amounts of data from diverse sources, including:<sup>(2)</sup>

EFFICIENT DATA PROCESSING	AI-powered algorithms are highly effective at processing large amounts of both structured and unstructured data from various sources, such as electronic health records, clinical trials, patient forums, and social media
REAL-TIME ADVERSE EVENT DETECTION	AI systems can quickly identify adverse events and safety signals in real-time, enabling pharmaceutical companies to take swift action. This early detection helps expedite regulatory responses and risk mitigation, potentially saving lives and protecting a drug's reputation.
PREDICTIVE ANALYTICS	AI has the power to predict potential safety issues or trends by analyzing historical data and real-world evidence, enabling pharmaceutical companies to take preventive measures such as updating drug labels or conducting further safety studies before problems arise.
AUTOMATED CASE PROCESSING	Can significantly improve efficiency in pharmacovigilance. By automating the process of collecting, analyzing, and reporting adverse drug reactions, AI-powered systems can streamline workflow and reduce the burden on healthcare professionals, allowing them to focus on patient care.
NATURAL LANGUAGE PROCESSING (NLP)	NLP technology allows AI to understand and process human language. In pharmacovigilance, NLP can be employed to extract important information from unstructured text, such as medical records and patient narratives, making it easier to identify and assess adverse events.
DRUG-DRUG INTERACTION ANALYSIS	AI assists healthcare professionals and researchers by analyzing potential interactions between different drugs, helping them avoid combinations that could result in adverse effects

## CHALLENGES AND ETHICAL CONSIDERATIONS:

While AI holds immense promise for Pharmacovigilance, several challenges and ethical considerations need to be addressed:

**1. Data Quality and Bias:** The accuracy and reliability of AI systems depend heavily on the quality and diversity of the data used to train them.

**2. Transparency and Explainability:** It's crucial to understand how AI algorithms make decisions, especially when it comes to patient safety.

**3. Privacy and Confidentiality:** AI-powered pharmacovigilance requires careful consideration of patient privacy and data confidentiality.<sup>[3]</sup>

## AI software in Pharmacovigilance



## Conclusion

AI is transforming pharmacovigilance, empowering healthcare professionals with the tools to identify and manage drug safety risks more effectively. By leveraging the power of AI, we can improve patient safety, enhance drug development, and ensure that medications are used safely and effectively. However, it is crucial to address the challenges and ethical considerations associated with AI implementation, ensuring that its benefits are realized while safeguarding patient rights and data privacy.

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# Streptococcal Toxic Shock Syndrome (STSS)

## An ongoing outbreak in Japan

Mrs. Leena Muppa, Assistant Professor

A deadly outbreak of Streptococcal toxic shock syndrome (STSS) is spreading rapidly across Japan, raising alarm among health officials. The disease, caused by a deadly 'flesh-eating bacteria,' has a mortality rate of 30% and can be fatal within 48 hours. Symptoms include fever, muscle aches, and organ failure. Similar outbreaks have been reported in other nations.

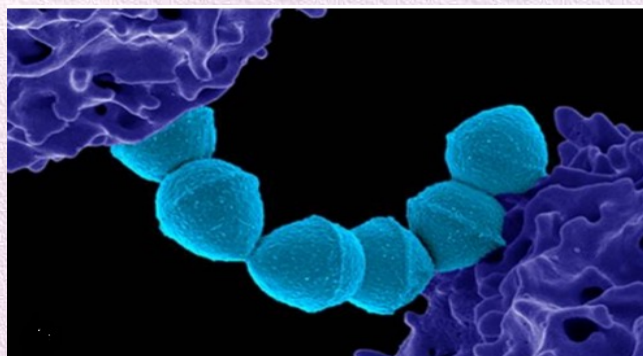
The World Health Organization (WHO) received reports of an upsurge in invasive group A streptococcus (iGAS) illness cases from at least five European countries in late 2022. The WHO observed a correlation between the increase in instances and the taking away of COVID restrictions. Vigilance and early treatment are crucial to combat this severe illness.

### What is STSS?

STSS, or Streptococcal Toxic Shock Syndrome, is a severe illness caused by infection with group A Streptococcus (GAS) bacteria. It is characterized by the rapid onset of shock and multi-organ failure, which can be life-threatening if not promptly treated.

### Signs and cure

Fever, chills, aches in the muscles, and nausea are some of the early signs of STSS. More severe symptoms, like low blood pressure, an accelerated heart rate, and organ failure, may appear as the disease worsens. Supportive care and high-dose intravenous antibiotics are used in treatment.



Group A Streptococcus -Deadly 'flesh-eating bacteria'  
Source: US National Institute of Allergy & Infectious Disease

### Who's in Danger?

The US CDC states that "people with an open wound are at increased risk for STSS." This includes those who have had recent surgery or have an open sore-causing viral infection. However, for about half of the cases with STSS, experts are unsure of how the germs enter the body.

### Preventive Measures

Good hygiene practice, prompt treatment for streptococcal infections, and careful observation of wounds and skin diseases are examples of preventive strategies. For the purpose of early detection and treatment, public health education regarding the signs and dangers of group A streptococcus infections is also essential.

Reference: <https://edition.cnn.com/2024/06/17/asia/japan-record-spike-stss-bacterial-infection-intl-hnk/index.html>

## ANNOUNCEMENT - CALL FOR APPLICATIONS

CALL FOR APPLICATIONS

### Master of Public Health (MPH) 2025–2026 Program

**BRAC James P. Grant School of Public Health, BRAC University in Dhaka, Bangladesh**

TDR Postgraduate Scholarship in Implementation Research

Academic Year 2025–2026

Deadline for applications: 15 August 2024

**Description:** The BRAC James P. Grant School of Public Health (BRAC JPGSPH) at BRAC University in Dhaka, Bangladesh, is pleased to announce a Call for Applications for the award of TDR Postgraduate Training Scholarships for the 1.5-years Master of Public Health (MPH) 2025–2026 Program, beginning in January 2025. The International MPH Program is an 18-month full-time program which is taught in English with a focus on promoting problem-based experiential learning.

**To access the prospectus** [https://bracjpgsph.org/assets/pdf/mph/Final\\_MPH%20Prospectus%202023-2024.pdf](https://bracjpgsph.org/assets/pdf/mph/Final_MPH%20Prospectus%202023-2024.pdf)

## National Action Plan on Antimicrobial Resistance (NAP-AMR) Module -2024



National Action Plan on Antimicrobial Resistance (NAP-AMR) Module -2024 for prescribers was released on 20 June 2024. The module emphasizes “No Antibiotics Before Diagnostic Test”. This module will guide the medical professionals to acquire requisite knowledge and skills along with positive shift in attitude towards responsible antimicrobial use.

Download pdf: <https://www.nmc.org.in/wp-content/uploads/2024/06/AMR%20Module%20for%20Prescribers.pdf>

## FREE ONLINE COURSE

Community Engagement and Involvement (CEI)

The aim of the course is to develop learners understanding and knowledge of CEI, supporting their ability to plan and design ethical and impactful CEI in global health research.

This course is open to all with an interest in CEI in health research.

For details : <https://globalhealthtraining-centre.tghn.org/introduction-and-practical-guide-cei-health-research/>

## DRUG SAFETY ALERT

File No:P.17019/01/2024-DA • Dated: May 21, 2024

Suspected Drug	Indications	Adverse Drug Reaction
Meropenem	For treatment of nosocomial pneumonia, UTI, intra-abdominal infection, gynecological infection, skin & soft tissue infection, meningitis, septicemia & empiric treatment of presumed infection in adult patients with febrile neutropenia.	Acute Generalized Exanthematus Pustulosis (AGEP)

Source: <http://www.ipc.gov.in>



## ARTIFICIAL INTELLIGENCE TOOLS

Some Artificial Intelligence tools that are making significant strides in education for students and teachers

- 1. Quillbot:** An AI powered writing assistant that excels in generating research citations and paraphrasing
- 2. Paperpal:** To simplify research writing and editing
- 3. ChatGPT:** A tool in conceptualizing the methodology for research papers.
- 4. Consensus:** An AI search engine that helps researchers find papers
- 5. Grammarly:** A comprehensive writing tool that fixes a variety of grammatical, spelling, and punctuation mistakes to help students improve their writing

## CLERKSHIP ACTIVITY

## ADR REPORT 1:

**T. Tacrolimus – Induced acute kidney injury**

- Reported by R.Bhavadharani  
Pharm. D Clerkship

Reported to the Pharmacovigilance Programme of India (PvPI)

**Type of report:** DSUR (Spontaneous)

**Worldwide unique id:** IN-IPC-300919481

**Report:**

Tacrolimus is the immunosuppressant that is prescribed to prevent the rejection of organs in transplant patients. tacrolimus acts by entering target cells and binds to FK 506 binding protein (cytoplasmic immunophilin protein) and inactivates the calcineurin so the response of the helper T cell to antigenic stimulation fails. The action attenuates IL2 and the production of killer lymphocytes. tacrolimus has several side effects and acute kidney injury associated with the drug has been seen with the symptoms of breathing difficulties.

The mechanism for the development of AKI is Tacrolimus binding proteins are present at a high concentration in the kidney (higher than in the liver and spleen) so the Tacrolimus reactivity is high in the kidney. The Tacrolimus inhibits the Calcineurin immunoreactivity and enzyme activity in the kidney that blocks a different cell signal involved in the T-cell proliferative response to interleukin-2. At the cellular level, morphologic observations suggest that tubular epithelial cells, vascular endothelial cells, arteriolar myocytes, and interstitial fibroblasts are all targets for Tacrolimus nephrotoxicity. Vasospasm leading to reduced glomerular filtration appears to be a key element in the nephrotoxicity of Tacrolimus.

**Causality Assessment:**

NARANJO'S SCORE: 8

WHO causality assessment shows probable ADR to the drug administered.

## ADR REPORT 2:

**T. Clopidogrel – Induced UGI bleeding**

- Reported by R.Bhavadharani  
Pharm. D Clerkship

Reported to the Pharmacovigilance Programme of India (PvPI)

**Type of report:** DSUR (Spontaneous)

**Worldwide unique id:** IN-IPC-300919611

**Report:**

A 39-year-old female patient with a history of Rheumatoid heart disease, Diabetes mellitus, Hypothyroidism, surgical procedure of Mitral valve repair, and Redo Mitral valve repair with tricuspid ring Anveloplasty. She was on T. Clopilet for 13 years and was admitted to the hospital for melena, and pallor. UGI bleeding was suspected clinically and confirmed by Physical examination and Complete blood count.

The patient required supportive care with sufficient intravenous fluids and monitoring. After her surgery of MVR with tricuspid ring Anveloplasty in 2010, the patient has been taking T. Clopilet for the past 13 years. Till recently she didn't have any adverse effects. However, the recent dose of T. Clopilet of 75mg resulted in the patient developing Melena and UGI bleeding accompanied by pallor skin. After admission, the drug was stopped, a Prothrombin test was done and the patient was monitored. PT – 11.3 INR – 0.91, Hb – 8.3, PCV – 27. Initially, T. Clopilet was stopped, Prothrombin level showed improvement. After 3 Days, the drug was rechallenged and PT time didn't show any variation and the drug was continued.

Type of ADR: Delayed

**Causality Assessment:**

WHO causality assessment shows probable ADR to the drug administered.



Pharm D Interns actively participated in the Demonstration on "Proper Administration of Insulin Pens" using Dummy Devices by Dr. Chandrasekar (HOD) General Medicine Department, Stanley Government Hospital and Mr. Palaniappan, National Head & Training Manager, Sanofi on 5<sup>th</sup> April 2024

## HEALTH DAYS

### WORLD TUBERCULOSIS DAY



Principal **Dr. CN Nalini**, Vice Principal, **Dr N. Ramalakshmi**, Faculty and Pharm D students with TB awareness pamphlets on 5<sup>th</sup> April 2024.



Tuberculosis awareness short film taken by Pharm D students and was displayed in all class rooms on World TB Day, conducted on 5<sup>th</sup> April 2024

### WORLD HEALTH DAY

As a part of World Health Day, on 7<sup>th</sup> April, CL Baid Metha College of Pharmacy has organized a yoga session for the students and faculty, since it has innumerable benefits that positively affect both physical and mental health.



**Mrs. K. Bharathi Priya**, Associate Professor & also yoga instructor, taught simplified hand and leg exercises to Pharm D students and staff on World Health Day on 7<sup>th</sup> April 2024

## WORLD HYPERTENSION DAY



Pharm D students monitored blood pressure to the public, distributed hypertension awareness pamphlets and provided patient counselling on anti hypertensive agents and lifestyle modifications on 16<sup>th</sup> June 2024, on World Hypertension Day



Pharm D students and faculty with hypertension awareness pamphlets on 16<sup>th</sup> June 2024, on World Hypertension Day

## CONFERENCES / SEMINARS ATTENDED



**Dr. T. Vishnu**, Assistant Professor & Pharm D Students attended CME Program on “Recent Pharmacotherapy Updates” conducted by Indian Association of Clinical Medicine, Tamil Nadu Chapter at ITC Grand Chola on 12<sup>th</sup> May, 2024.

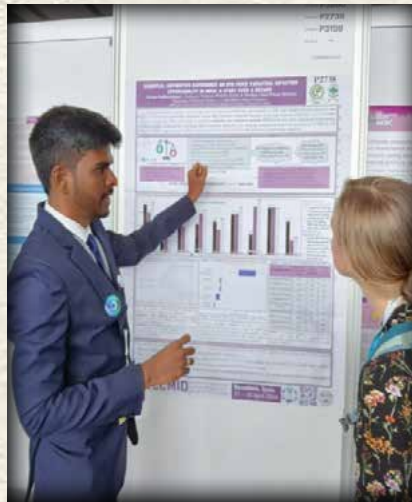
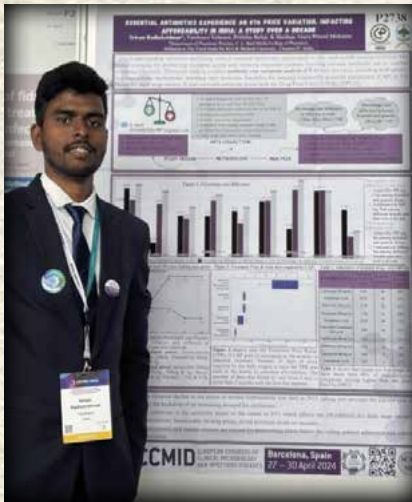


V Pharm D students attended one day workshop on “The Drug Calc Us” organised by Sundaram Medical Foundation, Chennai on 18<sup>th</sup> May 2024.

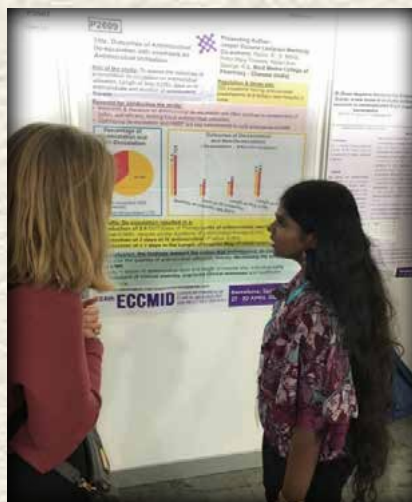
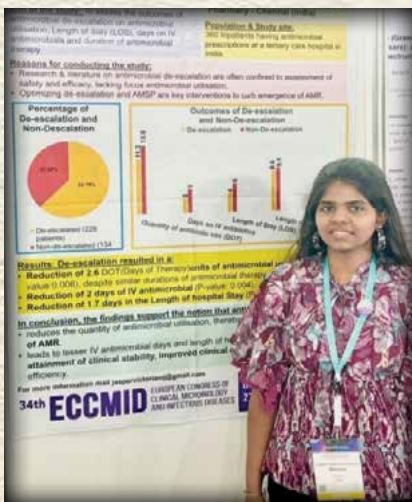
# Students Achievements

## Congratulations

**Mr. Sriram** (V Pharm D) and Ms. Jasper Victoria Leelarani M (Pharm D Intern) presented research paper in the 34th European Congress of Clinical Microbiology and Infectious Disease, (ECCMID-Global 2024) held at Barcelona, Spain on 27-30 April 2024. We thank our Principal Dr. CN Nalini and the Management for their unconditional support and make the students dream come true



**Mr. Sriram R**, V Pharm D Student presented poster entitled "Essential Antibiotics Experience an 87% Price Variation, impacting Affordability in India: A study over a Decade" in the 34<sup>th</sup> European Congress of Clinical Microbiology and Infectious Disease, (ECCMID-Global 2024) held at Barcelona, Spain on 27-30 April 2024.



**Ms. Jasper Victoria Leelarani M** Pharm D Intern student presented poster entitled "Outcomes of Antimicrobial De-Escalation with Emphasis on Antimicrobial Utilization" in the 34<sup>th</sup> European Congress of Clinical Microbiology and Infectious Disease, (ECCMID-Global 2024) held at Barcelona, Spain on 27-30 April 2024

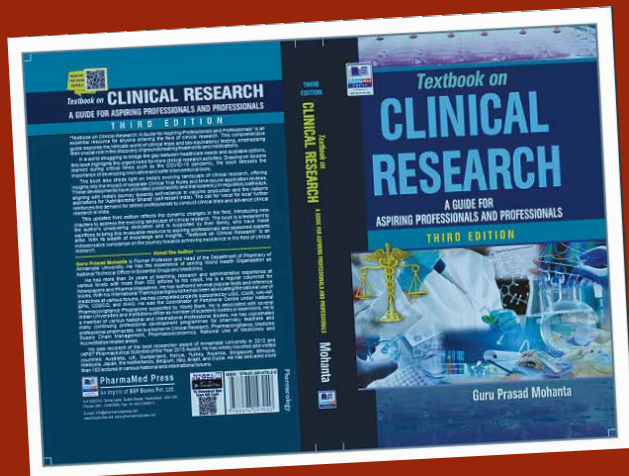


**Mr. Sriram R**, V Pharm D Student poster entitled "Pharmacovigilance assessment of Stevens John Syndrome/Toxic Epidermal Necrolysis (SJS/TEN) with Antibacterial drugs using food and drug administration adverse event reporting system data" got selected and won the poster prize at the British Society of Antimicrobial Chemotherapy Spring Conference (BSAC- 2024) at London on 16-17 May 2024



**Mr. R. Barath Raj**, V Pharm D received "Young Medical Entrepreneur of the year 2024" at World Health care Summit held at Dwarka, New Delhi on 20 April 2024

## TEXTBOOK ON CLINICAL RESEARCH: “A GUIDE FOR ASPIRING PROFESSIONALS AND PROFESSIONALS”



This is an essential resource for anyone entering the field of clinical research. This comprehensive guide explores the intricate world of clinical trials and bio-equivalency testing, emphasizing their crucial role in the discovery of groundbreaking treatments and medications

Author: **Dr Guru Prasad Mohanta**,  
Professor & Head  
Department of Pharmacy Practice  
CI Baid Metha College of Pharmacy



## CROSS WORD

Prepared by, Dr. Dhivya K, Assistant Professor

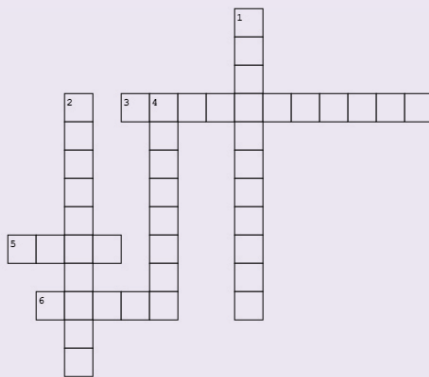
## STUDENTS CORNER

### ACROSS

3. A protein made by your liver essential for neutralization of oxidative damage
5. AI-based tool involved in determining the sites of metabolism of the drug
6. AI program for treating blood infections

### DOWN

1. A new FDA approved drug to treat WHIM syndrome
2. A rare connective tissue disorder with autosomal dominant inheritance
4. AI-powered drug discovery software



Answer for the Word Puzzle previous issue (March 2024, volume 5, issue 01)

#### Across

1. ABCC8
4. Klinefelter
6. AAS

#### Down

2. CFTR
3. AIWS
5. TP53

### CONGRATS TO THE WINNERS OF CROSS WORD PUZZLE

Previous Issue (March 2024)

Volume 5 issue 01

1. Pratibha N, Pharm D 5th year
2. Aadhira Jinnah, Pharm D 4th Year
3. Vincy Santhana Sophia, Pharm D 5th year
4. Darius Alan A, Pharm D 4th Year
5. Muhammad Marzuq, Pharm D 4th Year

Send your answers to [pharmatabclbaid@gmail.com](mailto:pharmatabclbaid@gmail.com)

First five winners name will be displayed in the next issue

For details and feedback contact:  
Department of Pharmacy Practice

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