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Inaugural issue



R_x FACTOR

News letter by

NATIONAL ASSOCIATION OF PHARMACOLOGY AND THERAPEUTICS

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Highlights

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Current Therapeutics, New Drugs, Banned Drugs, Integrated Approach to Therapeutics

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From the editorial desk

Warm greetings to all.

I will use treatment to help the sick according to my ability and judgment, but never with the view to injury and wrong doing...Into whatsoever houses I enter, I will enter to help the sick."

It's a proud privilege for us to introduce the inaugural edition of 'RxFactor', a one of a kind initiative from the NATIONAL ASSOCIATION OF PHARMACOLOGY AND THERAPEUTICS. The news letter 'R_x factor' has been master planned with a slew of new thinking, at the same time striving to retain the roots of historical thoughts that have greatly contributed to the growth of Pharmacology and Therapeutics as a speciality. Our mission will be dedicated to nurturing the passion for pharmacology and therapeutics in the young minds and with a vision of creating a drive for rational prescribing among the clinical community.

RxFactor has been designed to encompass the range and breadth of Pharmacology and therapeutics ranging from Medical Education, Pharmaco-vigilance, Research and Therapeutics. The highlights of the newsletter, will be an Academic Corner focussing on Current Therapeutics, New Drugs, Banned Drugs, Integrated Approach to Therapeutics, a Research Corner focussing on Trends in Current Research, areas of Research for UG & PG. There will also be dedicated sections on Pharmaco-vigilance with adverse drug reactions updates aimed at widening the horizon of safe therapeutics; new Teaching & Learning methods highlighting the importance of Competency Building & Skill Development, Current Updates from Regulatory Bodies and ethics. Finally RxFactor will be spiced with Mini Quiz, Puzzles and related Cartoons. We hope that the newsletter will serve as an edifice of knowledge and will definitely leave an imprint on the minds of the reader.

We take this opportunity to thank all the contributors team this initiative, their valuable insights and undeterred efforts. We would also like to thank our eminent group of contributors of RxFactor for their untiring efforts and constant support in making this e-newsletter a grand success. To quote Neil Armstrong here, **"This is a small step for us, as individuals but a giant leap for our speciality"**. We look forward to a happy education and mutual learning with all our readers

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Dr Padmaja Uday kumar

PRESIDENT'S MESSAGE

Dear Colleagues,

Irrespective of the specialisation a doctor pursues, knowledge of drugs is paramount to one's clinical practice. However, the place of pharmacology today does not reflect this fact. When we introspect, we would realize that we are largely responsible for the same. However, as it is said 'better late than never', this venture of uniting the fellow pharmacologists together from across the country will yield rich dividends for the speciality.

I have no doubt this association would reach greatest heights and contribute to the growth of our beloved speciality. I convey my sincere thanks to all fellow pharmacologists for the confidence in me and bestowing this post. It brings with it enormous responsibility too. With the support of all esteemed pharmacologists, I hope to make a difference.

As the president of this unique organization, I offer my very best compliments and well-wishes to the faculty members, scientists, consultants, residents and experts in pharmacology and therapeutics. Let's join our hands together through this association and work for raising the status of pharmacology and therapeutics.

Long live NPT

Dr Padmaja Uday Kumar

President

National Association of Pharmacology and Therapeutics



Dr. Rakesh Kumar Dixit

MESSAGE FROM GENERAL SECRETARY

Dear friends,

I feel privileged and honoured to be a part of the imagination of a devoted pharmacologist behind this endeavor. The imagination started a few years ago and his devotion, dedication & determination have ultimately carved that image into a real picture. Uniting medical pharmacologists (MD/DNB/DM Clinical pharmacology) on a single largest platform is a novel herculean task. National MD Pharmacology (NMDP) movement started on social media worked as the ignition for this must-needed change.

Pharmacology is an ever-changing branch and one of the most closely associated with therapeutics related to any specialty. Unfortunately, this prime branch remained ignored for so many years due to multiple reasons. Some of the reasons were unstructured undergraduate and postgraduate curriculum focusing more on the theoretical deeper aspects into the molecular level, unnecessary practical exercises, etc. Many thanks to the National Medical Commission (NMC) for updating the curriculum by removing the unnecessary part and focusing on the therapeutic parts in form of competency-based medical education (CBME) curriculum for MBBS and MD.

I would like to thank all esteemed pharmacologists for reposing their faith in me and bestowing on me this honour. The teamwork decides the results and I am sure that the team lead by eminent pharmacologists of this association will show the brightest future throughout the globe. May we all get success in achieving our prime objectives.

Long live NPT

Dr. Rakesh Kumar Dixit

General Secretary

National Association of Pharmacology and Therapeutics



MESSAGE

Started with a small beginning on social media National MD Pharmacology (NMDP) movement has boosted up during the lockdown period of Covid-19 in 2019. It was a systematic and targeted approach to bring all the pharmacologists of the country with an MD/DNB/DM Pharmacology/Clinical Pharmacology and therapeutics degrees on a single platform. We have received an overwhelming response from all over the country, especially senior pharmacologists who have supported the movement in a way not witnessed before. Today NMDP connects more than 200 medical colleges across the country. The majority of the members of NMDP are heads of departments/senior professors/directors of institutions or senior faculty members/consultants and researchers working in different medical institutions/research institutions and the pharmaceutical industry across the country.

Inspired by the constant encouragement to give it an identity and a legal entity, we are introducing an organization of medical pharmacologists in the country that truly represents the entire nation. The upcoming organization shall be known as the National Association of Pharmacology and therapeutics envisaged to empower medical doctors with specialty in pharmacology/clinical pharmacology & therapeutics and promote academic and clinical research in pharmacology/clinical pharmacology & therapeutics for the benefit of patients and society.

We are introducing this newsletter, RxFactor, which shall be a mouthpiece of our upcoming organization. I wish to appreciate the hard work and congratulate the editorial team and contributors of RxFactor for their dedication in bringing the inaugural issue within a short period.

Through this message, I call upon all esteemed colleagues of pharmacology/clinical pharmacology and therapeutics to come forward and join NMDP movement

Sincere regards

Dr C M Kamaal

National Coordinator

National MD Pharmacology

Bedside Pharmacology

Dr. Sarita Mulkalwar, Professor, Dr.D.Y.Patil Medical College, Pimpri, Pune 411018

The primary aim of pharmacology is to train students in rational therapeutics. However, whether or not this objective is achieved by our present, orthodox way of teaching is debatable. This dynamic and rapidly evolving branch of Medicine demands a concurrent evolution and innovation in our teaching technique as well. Students fail to see importance of pharmacology in clinical practice, and hence it has arguably become one of the most disliked subjects by the medical undergraduates. To some extent, this harsh reality reflects our inability to introduce them to the wonders of this beautiful subject and infuse a sense of excitement regarding the same.

Presently, *Pharmacology Teaching* is facing major challenges, one of which being the fact that at most of the institutes of India, teaching merely comprises of a series of didactic lectures using power point presentations (or other audiovisual aids). Even the practicals in pharmacology don't seem to have any direct clinical correlation. Teaching needs to be shifted from classroom to bedside. Analysis of the actual treatment received by the patient in the hospital in bedside clinics seems to be the most effective way of teaching rational pharmacotherapy and surely this could be one small, but decisive step towards a much-required revolution in academics



Much of the emphasis to date has been in the translation of classroom teaching to the clinic. However, an area of great potential is the expansion of patient insights and real-world clinical data to improve understanding of the students regarding drugs, by exposing the students to the real patients and their medical management. This may enhance their concept of rational therapeutics. Hence, reverse translation completes the cycle of knowledge gain by capturing critical learning from the classroom to the bedside, and back to the students again by reflecting on the same.

As teachers in this field, we should take this as a challenge. Efforts need to be directed towards creating interest in this subject and adding some element of reality by making it more clinical. I do agree that modern teaching trends in medical education do exhibit some form of a paradigm shift from the conventional classroom teaching methods by incorporating nonconventional teaching methods, like problem-based learning, seminar presentations, role plays and quizzes. The question is "Are they enough to clarify their concept of rational pharmaco-therapeutics and create interest in the subject in students' minds"?

Creative teaching module can be a part of theory as well as practical classes. Teaching-Learning strategies which focus on critical thinking and clinical reasoning have to be identified. Active, student centric learning must replace the entire process of passive learning. Reforms in education are required to promote deep understanding by incorporating medical management of the actual patient rather than following a superficial approach of problem-based learning. Students are an integral part of any education system and, therefore, we as teachers, need to spur our efforts to stimulate the students to be responsible for their own learning, by involving them to learn creatively in order to emerge as true professionals in the future.

The question remains, how can it be incorporated in already limited hours allotted to pharmacology? With the new CBME syllabus, 138 hrs have been allotted to practicals, small group learning, tutorials etc. while 80 hrs to the theoretical didactic teaching. So, Implementation of bedside pharmacology concept shouldn't be a problem. Pharmacology practicals do include case studies like congestive cardiac failure, diabetes mellitus, epilepsy, hypertension etc. A batch for practicals consists of approximately 50 students, which can be further be divided into 5 groups. Each group will have to visit the hospital and get the details of the patient as given in box below:

Name of the practical –

Date-

Patient details – Name

Age/Sex

Income

Indoor/Outdoor

Ward no/Bed no

Diagnosis :

Comorbid conditions (if any)

Medical management/Drug Therapy-

Important instructions if any

Adverse Drug Reaction if any

Comments-

They will have to analyze the medical management of the patient giving justification of the prescribed drugs. This will also help them to understand the basis of selection of a particular drug over others, factors taken into account while prescribing a drug like co-morbid condition, drug interactions, pharmaco-economics etc. History regarding important instructions given to the patient and adverse drug reactions if relevant can also be elicited. Emphasis of this practical will be on medical management and not on the diagnosis and clinical examination, so these practicals can be conducted in the college without disturbing the hospital decorum.

This transition and reformation by incorporating bedside pharmacology will surely transform the undergraduates' outlook of the subject. They will have more rational thinking towards medical management of the patients. They will also be able to correlate pharmacology clinically which will help in igniting curiosity in their minds, with understanding of the concept of rational pharmacotherapeutics.

COSMETOVIGILANCE AND INDIA

Dr Anuradha Nischal, Professor King George's Medical University, Lucknow Uttar Pradesh .

“Cosmetic” refers to “any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or otherwise applied to, the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance as stated in Drugs and Cosmetics Act Section III. India is fourth largest cosmetic market in Asia pacific region.

Cosmeto-vigilance is a recent concept. The process of collection, analysis, and assessment of adverse reactions occurring in cosmetics consumers is broadly considered as Cosmeto-vigilance. By identifying any potential health risk this process guarantees a strengthened safety for consumers.

Countries like France, Netherlands, the United States of America, Japan, East Asian countries and European countries have established their cosmeto-vigilance system from quite a long time.



Cosmetic industry in India is mature and fast growing in terms of product developments and marketing because user's preferences are changing on daily basis from only cosmetic, to more functional, advanced and specialised products. So apart from being nature friendly these products should be user friendly in the long run.

Cosmetics contain chemicals like phthalates, parabens, triclosan, siloxane, formaldehyde etc. might act as endocrine disruptors and increase risk of various diseases including cancers. These chemicals act by various mechanisms and may lead to various chronic problems. Compounds like phthalates, formaldehyde, parabens, siloxane and triclosan are used in facial moisturizers, anti-aging creams, foundations, fragranced products, nail paints. Phthalates are also used as a plasticizer in products like nail polishes to reduce cracking by making them less brittle. They are also found in hair sprays to avoid the stiffness by forming a flexible film on hair. Parabens are used as preservatives in foods, pharmaceuticals and cosmetics. These compounds are common ingredients in cosmetics, shampoos, body lotions, and sunscreens, where they are used to prevent microbial growth and prolong shelf life. Triclosan is a broad-spectrum antibacterial which is commonly used in cosmetics, dentifrices, soap, and other consumer products.

Although India is the 4th largest cosmetic market in Asia but the unwanted or adverse reaction due to cosmetic products go unnoticed due to lack of proper organised reporting system. Adverse reactions related to cosmetic products have still remained unmarked as most of the users are unable to identify it and report it timely. Thus it is the need of hour to ensure that there is a proper vigilance system is to protect health of Indian population



Competency based medical education

Pandemic module: PHASE II; 2.5:
Therapeutic strategies including new drug development

Dr Y Roja Ramani , Associate Professor, MKCG Medical College And Hospital , Brahmapur, Odisha

Competency addressed: Prepare a plan for evaluation of off label use of a drug [SH] – communication exercise.

Background: Healthcare providers at times prescribe the drugs for an unapproved use when they feel that it is medically appropriate for their patient. Such unapproved use of an approved drug even when given in different disease/ dose / dosage form/ route/ age, other than the approved form will be termed 'Off-Label'. Clinicians therefore should be aware of and comply with the laws and regulations governing off-label use in their practice. The involved risks and benefits need to be decided on case to case basis and explained to the patient. 'Off-Label' use of a number of drugs including herbal medications is being practiced during the current Covid-19 pandemic, there is not yet an approved medication regimen for COVID-19 infections.

Case scenario: A 57-year-old female with a history of hypertension presented with worsening fevers, cough, and respiratory distress. Chest X-rays revealed bilateral infiltrates worse at the lung bases and CT scan of the chest showed bilateral ground-glass opacities consistent with COVID-19. RTPCR testing revealed a positive COVID-19 result. On admission to the intensive care unit of your hospital, she was treated aggressively with high dose intravenous ascorbic acid, Hydroxychloroquine, and a loading dose of Remdesivir. How will you communicate the patient or her attendants regarding the off-label use of the above medications?

Check list for communication about the off label use of drug(s):

Sl. No.	Question	Response		
		Unsatisfactory	Satisfactory	Exceptional
1	Explanation of the disease condition			
2	Information about the prescribed drug			
3	Describe the meaning of off-label use			
4	Explanation that there are no drugs or therapies approved to treat the disease or medical condition			
5	Explanation about potential benefits of treating the disease or medical condition with this drug			
6	Explanation about the anticipated ADRs with this drug			
7	Information about anticipated drug interactions including drug-drug, drug-food with this drug			
8	Additional information of any			

SARS-CoV-2 VACCINES

Dr Ruchi Baghel, Associate Professor, RDG Medical College Ujjain, Madhya Pradesh

	Vaccine Name	Type	Storage Temp	Dose	Route of Administration	Current Status
1	Covishield (Serum Institute of India with AstraZeneca) (India)	Non-Replicating Viral Vector Vaccine (Chimpanzees Adenovirus)	2-8°C	2 doses 4-8 weeks apart	Intramuscular	Currently in use
2	Covaxin (Bharat Biotech in collaboration with ICMR-NIV) (India)	Whole-Virion Inactivated Vero Cell vaccine	2-8°C	2 doses 4-6 weeks days apart	Intramuscular	Currently in use
3	Moderna (USA)	mRNA Vaccine	-20 °C for 1month at 2-8°C	2 doses 4weeks apart	Intramuscular	Currently in use
4	Pfizer (USA)	mRNA Vaccine	-70 °C for 5days at 2-8°C	2 doses 4weeks apart	Intramuscular	Currently in use
5	Sputniv-V (Gamaleya National Research Vaccine Centre for Epidemiology& Microbiology, Russia)	Non-Replicating Viral Vector Vaccine	2-8°C	2 doses 21 days apart	Intramuscular	Currently in use
6	CoronaVac (Sinovac) (China)	Whole-Virion Inactivated Vero Cell vaccine	2-8°C	2 doses	Intramuscular	Currently in use
7	ZyCoV-D (Zydus Cadila) India's 3 rd Covid Vaccine	DNA Vaccine	2-8°C	3 doses	Intradermal	Phase 3 Clinical trial
8	Janssen COVID-19 vaccine (Janssen Research & Development, Johnson & Johnson)	Non-Replicating Viral Vector Vaccine	-20°C For 3 month at 2-8°	1 dose	Intramuscular	Approved for emergency use in all countries For use in 18 years of age and older
9	BBV154 (Bharat Biotech in collaboration with Precision Virologics (India)	Viral Vector Vaccine (Chimpanzees Adenovirus)		1 dose	Intranasal India's 1 st intranasal vaccine	Phase 1 clinical trial (March 2021)
10	COVI-VAC (Codagenix in partnership with the Serum Institute of India)	Live Attenuated with Weakened Actual Virus		1 dose	Intranasal	Phase 1 clinical trial (In Feb 2021)
11	INO-4800 (INOVIO Pharmaceuticals) (USA)	DNA Vaccine	Room temp	2 doses 4 weeks apart	Intradermal	Production & Scale up Underway

EXTRACT



Source: Group discussion NMDP

EXTRACT

NMDP family is a group of very experienced and learned Pharmacologists. All the esteemed members, have unquenchable thirst of knowledge which keeps them involved in discussions based on their experiences and difficulties, making NMDP group a sea of information. Team Rxfactor constantly involved extracting some valuable inputs by the members and put it in this section.

About Covid-19 Vaccine

#Use of COVID-19 vaccine in immunosuppressed: COVID-19 vaccination might provide a lower level of protection in people who are immunosuppressed or immunocompromised compared with the rest of the population, it is still very important to get vaccinated as it will offer a certain amount of protection against catching COVID-19. All three of the COVID-19 vaccines (Pfizer/BioNTech; AstraZeneca/Oxford; Moderna) are safe to use for people who are immunocompromised or immunosuppressed. None of these approved COVID-19 vaccines contain any active SARS-CoV-2 virus. *British Society for Immunology COVID-19 and Immunology Taskforce statement .

FDA Authorizes Additional Vaccine Dose for Certain Immunocompromised Individuals: The U.S. Food and Drug Administration amended the emergency use authorizations (EUAs) for both the Pfizer-BioNTech COVID-19 Vaccine and the Moderna COVID-19 Vaccine to allow for the use of an additional dose in certain immune-compromised individuals, specifically, solid organ transplant recipients or those who are diagnosed with conditions that are considered to have an equivalent level of immune-compromise.

#Interval between two doses of COVISHIELD revised to 12-16 weeks. *<https://pib.gov.in/Press Release>

#DCGI extends shelf life of Covishield Covid-19 vaccine from 6 to 9 months.

#Government's expert panel allows clinical trials for third dose (booster) of Covaxin: The expert panel of DCGI, has permitted Bharat Biotech to give a third dose of Covaxin, booster dose six months after second dose, to a few volunteers in its clinical trials of the Covid-19 vaccine.

AEFI after Covid-19 Vaccine

There was a lot of query about the duration upto which an event should be reported as AEFI after vaccination. It has been clarified that by state immunisation officer during state level causality assessment in Bihar that **Death within 2 months after vaccination to be reported as AEFI.**

In response to concerns about **increase in clotting after administration of Covishield** WHO Global Advisory Committee for Vaccine Safety has stated that AstraZeneca COVID-19 vaccine (including Covishield) continues to have a positive benefit-risk profile, with tremendous potential to prevent infections and reduce deaths across the world. The available data do not suggest any overall increase in clotting conditions such as deep venous thrombosis or pulmonary embolism following administration of COVID-19 vaccines. Reported rates of thromboembolic events after COVID-19 vaccines are in line with the expected number of diagnoses of these conditions.

EXTRACT



Life threatening ADR of Injectable Diclofenac

#We have already read few case reports of severe anaphylactic reaction to diclofenac but recently a case of **Kounis syndrome triggered by Diclofenac sodium** injection was reported. "Kounis syndrome" is Allergic angina and MI triggered by various drugs. *<https://www.sciencedirect.com/science/article/pii/S1878540913000431>

Pandemic pushed Online reporting of SAEs and Online National Drug Licensing System (NDLS)

#As per "The New Drugs & Clinical Trials Rules, 2019", Investigator, sponsor/CT-NOC Holder and Ethics committee shall report all Serious Adverse Events (SAEs) to the Central Licensing Authority through **SUGAM online portal for DCGI notification**.

#CDAC in coordination with CDSCO is launching an **Online National Drug Licensing System (NDLS) portal for issuance of licenses and certificates** for Drug and Cosmetics across the country for testing on 31st March 2021 and it will be operational from 15th April 2021. It can be accessed through <https://statedrugs.gov.in>.

For the effective implementation of CBME:

AETCOM is a multi subject module. For effective implementation its competencies should not be allotted department wise and it will be better to assign a AETCOM coordinator, whose responsibility should be to choose multi subject teams for each module.

Retrospective thesis topics are not preferred for **P.G. thesis**.

Microsoft teams is a cost-effective app for online teaching of more than 100 students.

NMC notifications and requirements:

#**Examinations during Pandemic:** NMC has relaxed earlier criteria in the provision of appointment of External Examiners in the PGMER, 2000. It has been stated that in wake of pandemic the Universities should try to adhere to the existing norms, if not feasible, External examiners can be selected from a different university of same state and in case of states having all medical colleges under same health university, examiners can be selected from any other medical college of the state provided examiners are physically present in both conditions.

*NMC notification – NMC/MCI-23(1)/2021-Med/006485 Dated-18/03/2021

Animal House:

NMC Inspections for P.G. courses animal hold area minimum of 200sq ft is sufficient for both U.G. and P.G. either LOP or sanction of P.G. seats.

For MBBS; Only animal holding area with temp and humidity control, cages are required. Animals not mandatory during inspection.

If an institute has IAEC, then registration with CPCSEA is mandatory.

Compiled by:

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PHARMACOLOGY PNEUMONICS

Drugs causing Teratogenicity : **AV PASS ACT**

All anti cancer drugs

Valproic acid

Phenytoin

Ace inhibitors

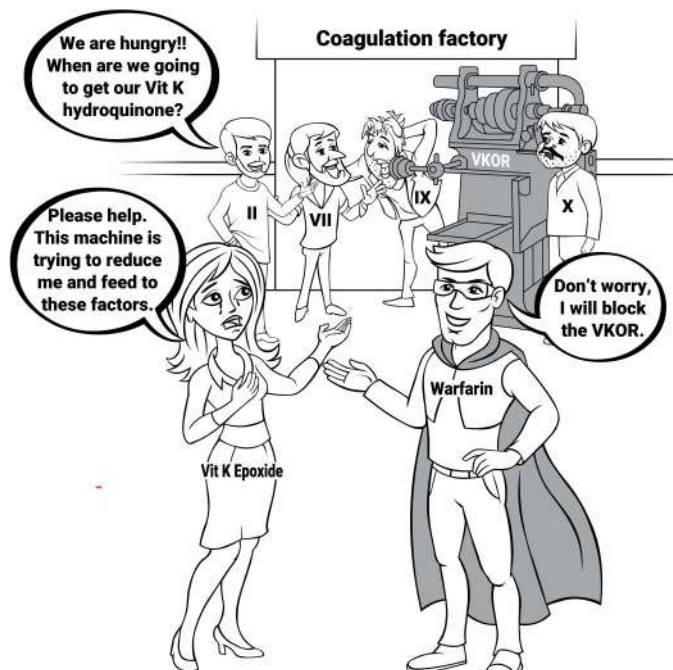
Sulfonamides

Sulfones

Amino glycosides

Chloramphenicol

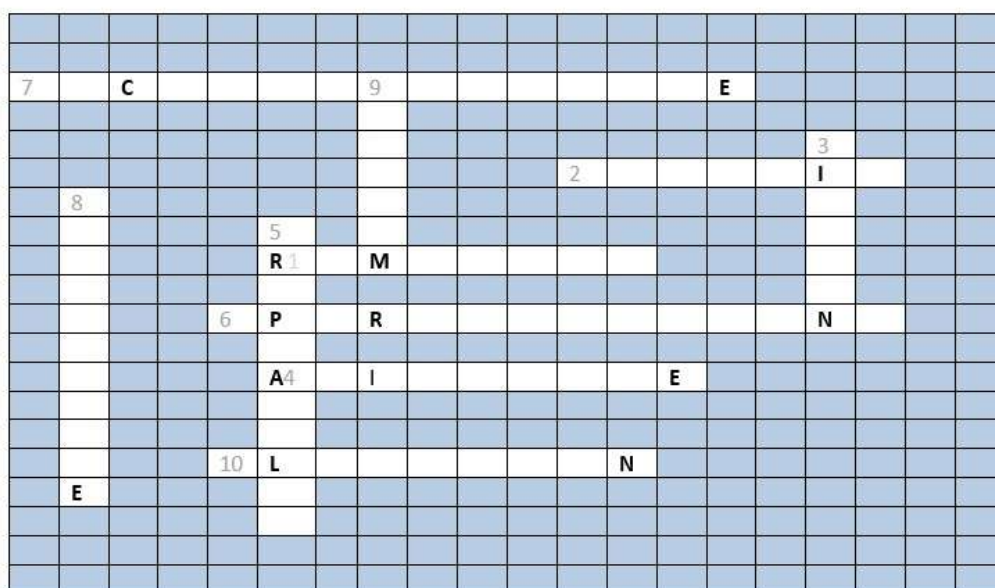
Tetracyclin



From the book: "Drug Autobiographies in Pharmacology" :
Dr. Sushil Sharma

CROSSWORD

Theme: Drugs causing Hyperkalaemia



Downward

1. Anti-hypertensive agent which has 'dry cough' as its one of the adverse drug reaction (8)
2. Anti-coagulant which can be used only through parenteral route (7)
3. Drug obtained from natural source 'Plant' used in CHF (8)
4. Diuretic acting through 'ENaC (Epithelial Sodium Channels)' at Collecting Duct (11)
5. Beta-blocker that is also used for prophylaxis of migraine(11)

Across

6. Drug which has 'gynaecomastia' as its one of the adverse drug reaction (14)
7. Very short acting depolarizing skeletal muscle relaxant (15)
8. Diuretic which can be used therapeutically through aerosol in cystic fibrosis (9)
9. Monovalent cation used in bi-polar disorder (7)
10. Direct Renin inhibitor (9)

Therapeutics Clinic-a new endeavor in patient care

Dr Sabnam Ara Begum, Assistant Professor ,R. G Kar Medical College and Hospital, Kolkata, West Bengal



Medicines remain one of the most important tools in healthcare delivery. The optimum success in any therapeutic endeavor relies mostly, if not always, in use of medicinal products – their prescribing, dispensing, administration and consumption. An adequately trained and informed pharmacologist with his /her professional wisdom can add enormous value as a member in care provider team. We from Department of Pharmacology, R G Kar Medical College and Hospital, Kolkata have been started at first a weekly Therapeutics Clinic OPD since Oct’2020.

What is a Therapeutics Clinic?

Therapeutics Clinic provides specialized care focusing on therapeutics. Here, medication related critical issues are addressed.

Whether it is already running in any hospital?

Yes. At School of Tropical Medicine, Kolkata - Clinical Pharmacology OPD

What type of patients will come to this therapeutics clinic?

Only referred patients for medication related issues from different clinical department from this institute will be treated in this therapeutics clinic.

Objectives of the Therapeutics Clinic:

- Identify ways to reduce polypharmacy
- Avoid drug-drug and drug-disease interactions
- Adjust doses for renal and hepatic impairment
- Avoid prescribing cascade, better replacing with suitable alternative
- Enhancing Medication Adherence by simplify the regimen

Standard operating Procedure (SOP)

Only referred patients for medication related issues from different clinical department from this institute will be treated in this therapeutics clinic. After therapeutic reconciliation the suggested reconcile prescription would be resent to respective referred clinical department.

Acknowledgement:

The faculties of pharmacology in R.G. Kar Medical College, Kolkata, are duly acknowledged. Prof Santanu Kr Tripathi, Ex-Professor & Head, Department of Clinical & Experimental Pharmacology, Calcutta School of Tropical Medicine, Kolkata, for providing support in write up proposal and conceptualizes this novel idea.



NATIONAL ASSOCIATION OF PHARMACOLOGY AND THERAPEUTICS

Promoting Pharmacology and Therapeutics for a better tomorrow

www.nationalpharmacology.org

About the organization

A national organization of medical doctors specialized in pharmacology /clinical pharmacology and therapeutics. Envisaged to provide strong leadership to promote pharmacology and therapeutics for a better tomorrow. The association is fostered by NMDP (National MD Pharmacology), a prestigious group of eminent pharmacologists.

Aims and objectives

- Empowering medical doctors specialized in Pharmacology/Clinical Pharmacology and Therapeutics.
- Promoting academic and clinical research in Pharmacology/Clinical Pharmacology and Therapeutics.
- Enhancing the standard of teaching/training in Pharmacology/Clinical Pharmacology and Therapeutics
- Promoting Pharmacology/Clinical Pharmacology and Therapeutics for the benefit of patients and society.



BENEFITS OF LIFE MEMBERS

- Receive notifications on of the organization
- Keep yourself updated in the world of pharmacology and therapeutics .
- Get connected with fellow pharmacologists of the country.
- Contest for various posts in the organization.
- Receive of the permanent membership e-certificate through email, enhance your profile by writing MNPT
- Participate in general body meetings (GBM) to speak and to vote.
- Participate in conferences/seminars/workshops/symposiums/training sessions at subscribed charges.
- Receive an e-copy of the official publications (i.e. News letter, Journal, academics, research material etc.



RxFactor

A triennially published newsletter by National Association of Pharmacology & Therapeutics

RxFactor is published triennially in April, August and December. RX Factor is published in an electronic format, as a universally compatible PDF file. Easy to read, you can zoom in, zoom out, search for text, send by email, and print as many copies as you like.

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