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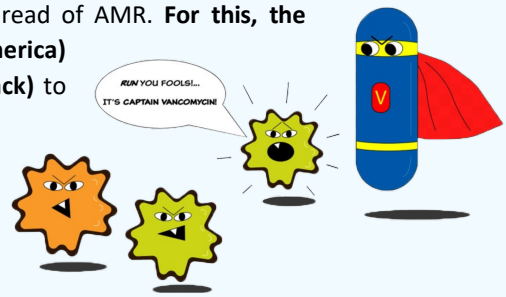
Inside this issue

De-escalation of Anti-MRSA agents to Minimize Antimicrobial Resistance

Almas Zahid (Resident Pharmacist)

An increase in antimicrobial resistance (AMR) has emphasized the importance of stratifying antimicrobial selection in terms of indications, dosages, and duration, particularly in methicillin-resistant Staphylococcus aureus (MRSA). Spectrum scoring may be used to shorten the time for antibiotic de-escalation in order to prevent the spread of AMR. **For this, the IDSA (Infectious Disease Society of America) recommends using PAF (prospective audit feedback)** to ensure appropriate antibiotic use.



PAF implementation may facilitate the following:

- Appropriate selection of antibiotics for empirical therapy
- Reducing the consumption of broad-spectrum antibiotics
- Decreasing incidence of infections by antibiotic-resistant organisms and Shortening the duration of antibiotic therapy

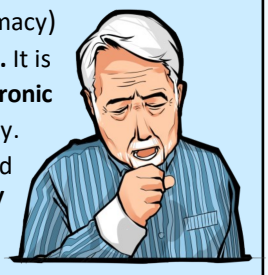
A recent study used PAF to determine the time to de-escalate anti-MRSA agents in related infections. A time series analysis revealed that **defined daily dose (DDD) per 1000 patients and days of therapy (DOT)** were used. The results indicated the duration of treatment with intravenous anti-MRSA agents **(Vancomycin, Linezolid, Daptomycin, and Teicoplanin)** to be significantly reduced in the post-PAF period compared to the pre-PAF period, from 7 days to 6 days ($p<0.001$). There was an ultimatum of reduced anti-MRSA consumption with no difference in clinical outcomes.

De-escalation of antimicrobials using scoring strategies can help optimize antimicrobial use and further categorize antibiotic prescribing patterns to minimize antimicrobial resistance to broader-spectrum antibiotics.

Reference: *Prospective audit and feedback implementation by a multidisciplinary antimicrobial stewardship team shortens the time to de-escalation of anti-MRSA agents. PLoS One. 2022 Jul 29;17(7):e0271812*

Gabapentin in the Treatment of Chronic Cough

Rehan Anjum (AM Clinical Pharmacy)



Gabapentin is approved for the treatment of **seizures and neuropathic pain.** It is now also considered a possible therapeutic option in patients with **chronic cough** based on improved understanding of chronic cough pathophysiology. The efficacy of gabapentin was evaluated in a 10-week randomized controlled trial (N = 62), and results indicated that **gabapentin (1800 mg/ day) significantly improved LCQ scores compared with placebo (P = .004)**. It also **decreased cough severity** scores (P = .029) and objective cough frequency (P = .028) by week 8. Once treatment was discontinued, the antitussive effects were not sustained. **Current CHEST guidelines recommend a trial of gabapentin as long as patients are educated on the potential for AEs and the risk–benefit profile along with a reassessment of risk–benefit at 6 months before continuing therapy.**

Reference: Gibson et.al, CHEST Expert Cough Panel. Treatment of unexplained chronic cough: CHEST guideline and expert panel report. Chest. 2016;149(1):27-44

APPLICATION OF ARTIFICIAL INTELLIGENCE IN PHARMACY PRACTICE

Sana Asghar (Resident Pharmacist)

Artificial intelligence (AI) has made significant progress in recent years, and it has found its way into several fields, including pharmacy practice. The use of AI in pharmacy practice has numerous advantages including: medication **management, medication adherence, and predictive analytics**. AI can enhance patient care, boost productivity, and decrease pharmaceutical errors, revolutionizing pharmacy practice. However, the use of AI in pharmacy practice is still relatively new, and there are ongoing discussions about the appropriate use of these technologies and the potential impact on patient care.

The primary advantages of using AI in pharmacy practice are:

- **Managing drug orders** by **evaluating patient data,** including medical history and prescription records, warning them of potential pharmaceutical interactions or allergies.
- **Correcting dosage mistakes** and recommending the best treatment regimens.
- **Enhancing medication adherence** by reminding patients to take their medications and educating them about them, assisting patients in managing their drug regimens.
- **Tracking patient compliance** and notify pharmacists of non-compliance.
- **Predicting pharmaceutical demand**, **enhancing inventory control,** and locating places where workflow can be improved through predictive analytics. In addition to ensuring that patients have access to the medications they require, this technology can assist in **reducing waste.**

While challenges and potential drawbacks to consider for AI in pharmacy are:

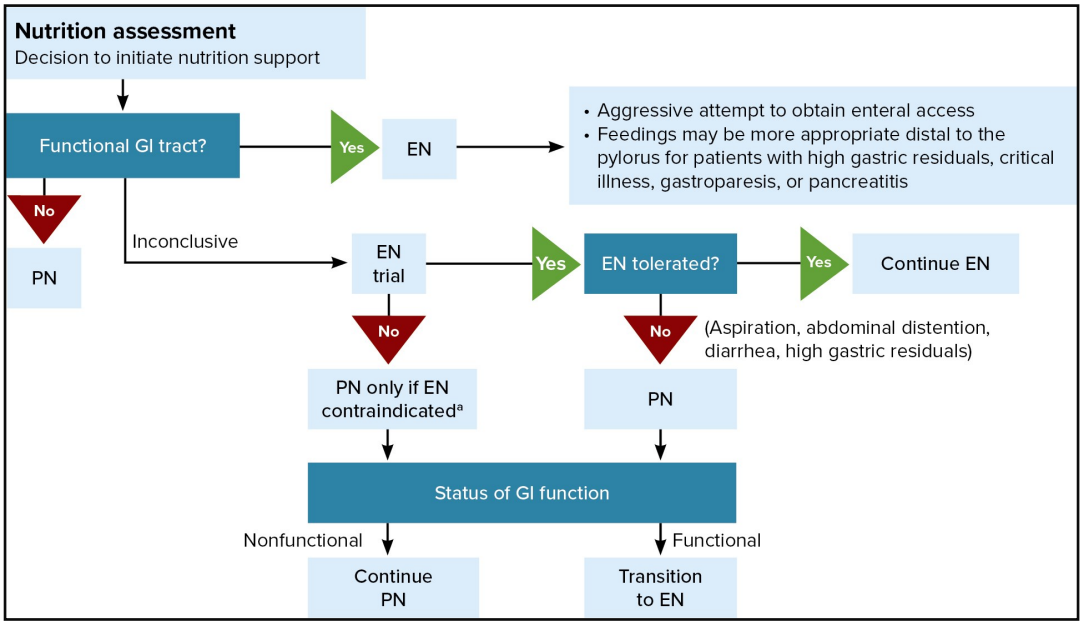
- **Potential for errors or bias**. AI systems rely on large amounts of data to make decisions, and if this data is incomplete, inaccurate, or biased, the system's decisions can be flawed. Additionally, bias in the data used to train AI systems can lead to disparities in care for different patient populations.
- **Risk of over-reliance on technology**. While AI can assist pharmacists in making patient care decisions, however it is not a substitute for human judgment and expertise. Pharmacists must be able to interpret and validate the AI information and make own decisions based on their clinical judgment and experience.
- **Dehumanization of patient care**. The reduced face-to-face interactions between pharmacists and patients, could impact the quality of care and the patient experience.
- **Financial and technological barriers** to the implementation. AI systems require a certain level of technical expertise to operate and maintain, which may be a challenge for some pharmacists.
- **Ethical concerns** around the use of AI in pharmacy practice.

In conclusion, AI has the potential to revolutionize pharmacy practice and improve patient care, but comes with several challenges and drawbacks. Pharmacists must carefully evaluate the benefits and limitations of AI systems and ensure that they are used in a way that enhances, rather than replaces, human expertise and judgment. As AI continues to develop, it is crucial for pharmacists and other healthcare professionals to stay informed and up-to-date on the latest advancements and innovations in this rapidly evolving field.

A useful algorithm for determining the appropriate indications for Parenteral Nutrition (PN):

Clinicians should consider PN if: a trial of **enteral feedings has failed**, if the **enteral route is contraindicated**, or if the **GI tract has severely diminished function** because of underlying disease or treatment and **GI function is not expected to return within 7 days**.

Contraindications to PN : a functional GI tract; an inability to achieve appropriate venous access; an unstable clinical condition; and terminal disease, critical illness, or metabolic derangement for which a favorable response to therapy is not feasible or the risk for complications is too high. In malnourished patients with chronic kidney disease requiring hemodialysis, intradialytic PN should not be used as the sole nutrition; it may be considered for malnourished patients unable to ingest or absorb adequate oral nutrition or EN.



Reference:

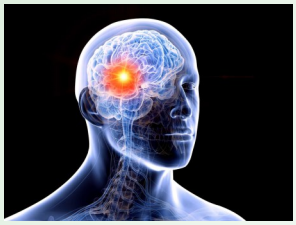
https://www.pharmacypracticenews.com/Review-Articles/Article/03-23/Parenteral-Nutrition-Therapy/69633

Anti-Parasitic 'Mebendazole' as a Repurposed Drug for the Brain Cancers?

Maria Farooq (Resident Pharmacist)

Mebendazole is a broad-spectrum anthelmintic that was discovered in 1968 and approved for use on humans in 1971. It directly affects luminal parasites in the digestive system by blocking microtubule activities in parasites and human cells. Due to its interaction with microtubules, it has been studied as a potential anticancer agent.

Fenbendazole, another anthelmintic drug, was found to decrease brain tumor engraftment in animal experiments in 2011. This led to interest in using mebendazole as a substitute for vincristine in the treatment of brain cancers. Mebendazole has a low toxicity profile and can potentially pass the blood-brain barrier, making it appealing as an anticancer therapy.



The **first clinical case report** on mebendazole as a cancer treatment in a human patient was published in 2011. It described a 35-year-old woman with metastatic adrenocortical cancer who experienced extended tumor response after taking mebendazole orally twice daily for 19 months. *Her liver metastases regressed and remained stable for 19 months.*

Phase I/II clinical trials are currently underway to examine the anticancer benefits of mebendazole in combination with standard-of-care drugs for juvenile brain tumors that have returned and are not responding to normal therapy. Patients with a diagnosis of medulloblastoma or high-grade glioma who are between the ages of 1 and 21 are eligible for this experimental trial. The trial is testing the safety and efficacy of mebendazole in combination with other drugs over a period of 70-48 weeks.

Conclusion:

The repositioning of mebendazole to treat brain cancer shows promise as a quick and inexpensive way to increase the number of approved medications for improved brain cancer treatment. Mebendazole may be used as an alternate medication to treat GBM patients who are sensitive to TMZ either alone or in conjunction with TMZ. The study is ongoing and expected to be completed in April 2025.

Reference: *Meco, D. (2023). Emerging Perspectives on the Antiparasitic Mebendazole as a Repurposed Drug for the Treatment of Brain Cancers. Int J of Molecular Sciences, 24(2), 1334*

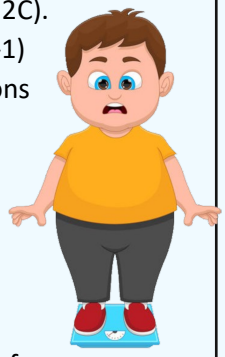
Do You Know?

Mebendazole removes roundworms, but not their eggs. Therefore, it is also important to break the cycle of re-infection which can occur - this can be done by following a few simple hygiene measures to prevent you from swallowing eggs. This include: thorough hand washing esp. nails after using toilet and before touching food, disinfecting toilet seats, Wear underwear or pyjamas in bed, Have a bath or shower, immediately after waking up in the morning, to wash away any eggs that have been laid during the night.

Semaglutide for obesity in adolescents

Naiha Tahir (Resident Pharmacist)

For adolescents with refractory obesity who opt for pharmacologic therapy, subcutaneous semaglutide rather than other agents is suggested (Grade 2C).



Glucagon-like peptide (GLP-1) analogs are important options for treatment of type 2 diabetes and/or obesity in adults. In a 68-week randomized trial in 201 adolescents with obesity, patients assigned to weekly S/C semaglutide (at a dose of 2.4 mg) or placebo for 68 weeks, plus lifestyle intervention. The mean **change in BMI** from baseline to week 68 was −16.1% with semaglutide and 0.6% with placebo (P<0.001). While (73%) in the semaglutide group had **weight loss** of 5% or more, as compared with 11 of 62 participants (18%) in the placebo group (P<0.001) The incidence of **GI adverse events** was greater with semaglutide than with placebo (62% vs. 42%). Five participants (4%) in the semaglutide group and no participants in the placebo group had cholelithiasis.

Conclusion: Among adolescents with obesity, once-weekly treatment with a 2.4-mg dose of semaglutide plus lifestyle intervention resulted in a greater reduction in BMI than lifestyle intervention alone.

Reference*: Once-Weekly Semaglutide in Adolescents with Obesity. The New England journal of medicine, 2022, 387(24), 2245–2257.*

Changing the name of Diabetes Insipidus - Goodbye 'Diabetes Insipidus', Hello 'AVP-D' and 'AVP-R'

In a survey of 1034 patients with central diabetes insipidus, 823 (80 %) described situations in which their diagnosis was confused with diabetes mellitus by healthcare professionals. The great majority (85 %) supported renaming the disease. In one report, a tragic incident of a 22-year-old Kane Gorny, who received a hip replacement at hospital and died of thirst and dehydration as a result of confusion about his diagnosis (Diabetes Insipidus vs Diabetes Mellitus).

In 2022 a working group of representatives from national and international endocrinology and pediatric endocrine societies now proposes changing the name of **"diabetes insipidus" to "Arginine Vasopressin Deficiency (AVP-D)" for central etiologies, and "Arginine Vasopressin Resistance (AVP-R)" for nephrogenic etiologies.**

***Reference*:** Changing the name of diabetes insipidus: a position statement of The Working Group for Renaming Diabetes Insipidus. Endocrine journal, 69(11), 1281–1284. 2022

5S Tools for Enhancing Medication Efficiency and Safety Practices

Huba Gulzar (Resident Pharmacist)

Demand for healthcare services is substantially exceeding available resources. With a recession underway, now more than ever, there is an overwhelming need to cut costs and reduce waste (time and materials) by improving service efficiency whilst optimizing patient safety.

Lean approach is used to evaluate an organization's procedural processes, identify waste (elements that do not contribute to value) and develop solutions to promote quality and efficiency in a continuous cycle of process improvement. Based on these principles, the Toyota automobile manufacturing company developed the **5S framework** in the 1980s to organize, standardize, and maintain a working environment to maximize system performance.

The **5S** components of this framework are:

- ◊ **Sort:** identify unneeded/unsuitable items (including expired items) that can be removed, and categorize remaining items by necessity or product families.
- ◊ **Straighten:** organize needed items into appropriate, accessible locations based on need in order of flow to aid ergonomics.
- ◊ **Shine:** clean the work area and fix broken items.
- ◊ **Standardize:** ensure procedural consistency of all users, and establish them in the culture of the organization.
- ◊ **Sustain:** uphold and enhance the previous four steps through audits and quality improvement. This involves efforts from all members of a system.

5S is not just about eliminating waste but promoting the mentality of continuous change. Without continual maintenance, improvements are quickly lost. A thoughtfully designed systems approach, which can be continuously improved through the actions of motivated teams, is likely to be most appropriate in promoting efficiency and cutting costs whilst optimizing safety in health systems.

***Reference*:** Moore AJS, Webster-Edge S. 5S solutions to promote medication efficiency and safety. Br J Anaesth. 2023 Mar; 130(3):e416-e418. doi: 10.1016/j.bja.2022.11.021.

Proud Achievements

Congratulations

Nabeel Qamar Alvi

Associate Manager
Quality Services

Achieved

"CERTIFIED PROFESSIONAL IN HEALTHCARE QUALITY"

The Certified Professional in Healthcare Quality (CPHQ) is accredited certification in healthcare quality.

Congratulations

Aimen Faheem

Staff Pharmacist
Ambulatory Care

Certified in

Anticoagulation Therapy Management

This certification is another milestone achieved towards specialty based pharmacy practice; and it will definitely help improving Anticoagulation Stewardship in the hospital which is certainly the need of the day.

Salwa Ahsan, Chief of Pharmacy (Shifa) was invited as speaker in International Conference on Emerging Trends in Pharmaceutical Sciences 2023—Capital University of Science & Technology (CUST) - Islamabad and in PACE Summit (Pharmacist Alliance for Continued Excellence) - Lahore

Formulary Updates ***(Visit Shifa Intranet Home Page—click Medication Updates for details)***

Brand	Generic	Class	Indications
Rovista Ez	Ezetimibe and Rosuvastatin	Antilipemic Agents	Homozygous familial hypercholesterolemia
Medicarpine	Pilocarpine 2%	Ophthalmic Agent, Antiglaucoma	Elevated intraocular pressure
Zinforo Inj.	Ceftaroline fosamil	5th Generation Cephalosporin	Skin/soft tissue infections, Pneumonia
Trimbow Inhaler	Beclometasone, Formoterol, Glycopyrronium	Anti-Asthmatic	Asthma, COPD

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