Pharmacy Practice Newsletter

"Know what's new… Optimize care"

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Introduction

The Central Administration of Pharmaceutical Care in the Egyptian Drug Authority is keenly interested in upgrading the pharmaceutical services provided to the patients and boosting the pharmacotherapy-related knowledge of all healthcare providers, which will positively impact the patient's health and safety.

From this point, **the General Administration of Drug Utilization and Pharmacy Practice (DU&PP)** is pleased to publish the *Pharmacy Practice Newsletters*, which aims to aid practitioners in their mission to optimize care. Topics related to pharmacotherapy and pharmacy practice will be addressed in our newsletter. The newsletter will provide an up-to-date, concise summary that fits perfectly into the healthcare provider's tight schedule.

We utilize accredited resources and indexed journals integrating the best available research into clinical care, to support the decision-making process for healthcare professionals. To optimize patients' treatment plans and ensure their safety and efficacy, clinicians must closely follow the literature for any updates related to their practice, given the dynamic nature of the clinical research.

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Inside this issue

EDA Pharmacy Practice Publications
National Guidance for Antimicrobial Use in Infections with Multi-Drug-Resistant Organisms (MDROs)

The National Rational Antimicrobial Use Team within the Drug Utilization and Pharmacy Practice Administration has issued the "*National Guidance for Rational Antimicrobial Use in Infections with Multi-Drug-Resistant Organisms (MDROs)*". The guide comes as a part of the EDA's relentless efforts to rationalize antimicrobial use in collaboration with several stakeholders represented in the National Rational Antimicrobial Use Committee, which has rigorously reviewed this guide.

Aim of the guide

- Describing appropriate antimicrobial chemotherapy for infections due to MDROs.
- Describing best practices in antimicrobial prescribing, including antimicrobial agents available in Egypt.
- Serving as a clinical guide in the management of individual patients.

Introduction

The global rise in antibiotic resistance poses a significant threat, diminishing the efficacy of common antibiotics against widespread bacterial infections. The 2022 Global Antimicrobial Resistance and Use Surveillance System (GLASS) report highlights alarming resistance rates among prevalent bacterial pathogens. Median reported rates in 76 countries of 42% for third-generation cephalosporin-resistant E. coli and 35% for methicillin-resistant Staphylococcus aureus are a major concern. This is making it harder to effectively treat common infections.

Klebsiella pneumoniae also showed elevated resistance levels against critical antibiotics. Increased levels of resistance potentially lead to heightened utilization of last-resort drugs like carbapenems, for which resistance is in turn being observed across multiple regions. As the effectiveness of these last-resort treatments becomes compromised, managing infections becomes increasingly challenging. Projections by the Organization for Economic Cooperation and Development (OECD) indicate an anticipated twofold surge in resistance to last-resort antibiotics by 2035, compared to 2005 levels, emphasizing the urgent need for robust antimicrobial stewardship practices and enhanced surveillance coverage worldwide. AMR represents a global challenge; in 2019, an estimated 4.95 million deaths were associated with drug-resistant infections in individuals with comorbidities, while 1.27 million of those deaths were directly attributable to AMR. Notably, one in five of these deaths occurred in children under five years of age.

Content of the guide:

In this guide, you will find the following items covered:

- The burden of antimicrobial resistance (AMR) on the global level
- The Antimicrobial Consumption Data (AMC) in Egypt
- The most problematic antibiotic-resistant bacteria in healthcare facilities
- Multi-resistant Gram-Negative Bacilli (MRGN)
- Definitions of MDR, XDR, and PDR for different MRGN
- Colonization versus true infection
- Managing infection of Acinetobacter baumannii, Enterobacteriaceae, Pseudomonas aeruginosa, Stenotrophomonas maltophilia
- Managing infection of multi-resistant gram-positive cocci, vancomycin-resistant Enterococci (VRE)
- Suggested dosing of antibiotics for the treatment of infections caused by antimicrobial-resistant organisms
- Duration of therapy for common clinical syndromes.

Where to find the guide:

The '*National Guidance for Antimicrobial Use in Infections with Multi-Drug Resistant Organisms (MDROs)*' is published on the EDA official website and can be accessed via this LINK or the QR Code.

Clinical Pharmacy Tips
Resistant Enterobacterales

Introduction

Enterobacterales are a group of bacteria that are a normal part of the human and animal gut, but can also cause infections in some circumstances. In this issue, we highlight infections caused by extended-spectrum β-lactamase-producing Enterobacterales (ESBL-E) and AmpC β- lactamase-producing Enterobacterales (AmpC-E).

Definitions

1) **ESBL:** ESBLs are enzymes that inactivate most penicillins, cephalosporins, and aztreonam. Organisms carrying ESBL genes often harbor additional genes or mutations in genes that mediate resistance to a broad range of antibiotics. They show transferable resistance to 3rd and 4th generation cephalosporins. EBSL-E generally remains susceptible to carbapenems.
2) **AmpC β-Lactamase:** Shows transferable beta-lactam resistance, AMP-C.

The resistance gene/enzyme	**ESBL**	**AmpC β-Lactamase**	
The most common Enterobacterales at risk for producing the resistance enzyme/gene	Any gram-negative organism has the potential to harbor ESBL genes; however, they are most prevalent in: • Escherichia coli • Klebsiella pneumoniae • Klebsiella oxytoca • Proteus mirabilis	**Most recovered organisms:** • Enterobacter cloacae complex • Klebsiella aerogenes • Citrobacter freundii	**Less commonly recovered organisms:** • S. marcescens • M. morgannii • Providencia spp
The antibiotics are <u>AVOIDED</u> empirically (or even if an isolate initially tests susceptible to these agents)	• Piperacillin-tazobactam is not suggested for the treatment of infections outside of the urinary tract caused by ESBL-E • Ceftriaxone, cefepime, cefoxitin or cefotetan • **N.B.,** if cefepime or piperacillin-tazobactam were initiated as empiric therapy for uncomplicated cystitis caused by an ESBL-E and clinical improvement occurs, no change or extension of therapy is necessary, but there may be treatment failure.	• First-generation cephalosporins, cefoxitin, cefotetan. • Ceftriaxone, cefotaxime, ceftazidime (for any infection other than uncomplicated cystitis) • Aminopenicillins (i.e., amoxicillin, ampicillin). • Piperacillin-tazobactam is not suggested for the treatment of serious infections caused by the mentioned organisms. • Aztreonam	• Ceftriaxone (for infections with limited source control (e.g., endocarditis, central nervous system infections)
The active antimicrobial agents	• Carbapenems • Ciprofloxacin • Levofloxacin • Trimethoprim-sulfamethoxazole (TMP-SMX) • Gentamicin • Piperacillin/tazobactam (only for UTI)	• TMP-SMX • Fluoroquinolones • Aminoglycosides • Cefepime • Ceftriaxone, Ceftazidime, and piperacillin-tazobactam (used only if the mentioned organisms are recovered in clinical urine cultures in uncomplicated cystitis)	• Cefepime (for infections with limited source control (e.g., endocarditis, CNS infections)

Recommended Treatment Options

Lab reports/Clinical Syndrome	Recommended Treatment	Alternative Treatment
Uncomplicated AmpC-E cystitis	• Nitrofurantoin • TMP-SMX	• Aminoglycosides a single IV dose • Ciprofloxacin or Levofloxacin
AmpC β-Lactamase **Invasive infections**	• Fluoroquinolones • Oral step-down therapy with TMP-SMX or fluoroquinolones is a reasonable treatment consideration for Enterobacterales bloodstream infections if susceptibility is shown and clinical criteria are met.	
ESBL producer causing infections outside the urinary tract. **(ESBL-E)**	• Meropenem • Imipenem cilastatin • Ertapenem **N.B.,** it is suggested that the use of meropenem or imipenem-cilastatin, rather than ertapenem, is preferred as initial therapy in critically ill patients with ESBL-E infections. Oral step-down therapy to ciprofloxacin, levofloxacin, or TMP-SMX can be considered after: • Susceptibility to the oral agent is demonstrated. • Patients are afebrile and hemodynamically stable. • Appropriate source control is achieved. • There are no issues with intestinal absorption.	• Ceftazidime- avibactam • Ceftolozane-tazobactam N.B., they are better to be reserved for carbapenem-resistant organisms.
Uncomplicated cystitis due to (ESBL-E)	• Nitrofurantoin • TMP-SMX	• Amoxicillin/clavulanate (May be used only if in vitro susceptibility is confirmed or, for empiric therapy, when recent local isolates demonstrate reliable susceptibility.) • Ciprofloxacin, levofloxacin, and carbapenems
Pyelonephritis or complicated urinary tract infection UTI due to (ESBL-E)	• Ciprofloxacin • Levofloxacin • Trimethoprim/ sulfamethoxazole	• Ertapenem. • Meropenem. • Imipenem/Cilastatin. • Aminoglycosides for a full treatment course.

Clinical Pharmacy Tips
Diabetic foot

Introduction

The International Diabetes Federation estimates that 13.2 million adults in Egypt in 2024, aged 20 to 79, have diabetes, and this number may reach 24.7 million by 2050, placing it among the top ten nations with the highest prevalence of the disease. As diabetes rates rise, the likelihood of foot complications and infections among affected individuals also increases due to the disease's impact on circulation and nerve health.

Diabetic foot infections (DFIs) continue to be the most common cause of lower extremity amputations, with an increased risk 154.5 times higher than in people without infection.

According to a major prospective study, at the end of one year, the results for patients who presented with an infected diabetes-related foot ulcer (DFU) are as follows: only 46% of patients had cured their ulcer (and 10% of those patients had it recur), 15% had died, and 17% needed a lower extremity amputation.

Potential Empiric Therapy for the Treatment of Diabetic Foot Infections

Infection Severity	Probable Pathogen(s)	Antibiotic Regimen
Mild	MSSA, Streptococcus spp.	• Cephalexin PO (for non-complicating features) • Clindamycin PO (for B-lactam allergy or intolerance) • Levofloxacin/moxifloxacin PO (for B-lactam allergy or intolerance, or recent antibiotic exposure) • Amoxicillin/clavulanate, ampicillin/sulbactam PO (for recent antibiotic exposure)
	MRSA§	• Clindamycin • Trimethoprim-sulfamethoxazole • Doxycycline
Moderate or Severe	MSSA, Streptococcus spp., Enterobacteriacea, anaerobes	• Amoxicillin/clavulanate (for non-complicating features) • Ampicillin/sulbactam IV (for non-complicating features) • Ceftriaxone + metronidazole (for ischemic limb/necrosis/gas forming) • Ertapenem (for recent antibiotics, ischemic limb/necrosis/gas forming) • Meropenem (for macerated ulcer or warm climate, ischemic limb/necrosis/gas forming, risk factors for resistant gram-negative rods) • Imipenem/cilastatin (for macerated ulcer or warm climate, ischemic limb/necrosis/gas forming, risk factors for resistant gram-negative rods) • Clindamycin (in combination with gentamicin)
	Pseudomonas aeruginosa∞	• Cefepime • Piperacillin/tazobactam • Imipenem/cilastatin • Meropenem
	MRSA§	• Vancomycin • Teicoplanin • Linezolid • Daptomycin

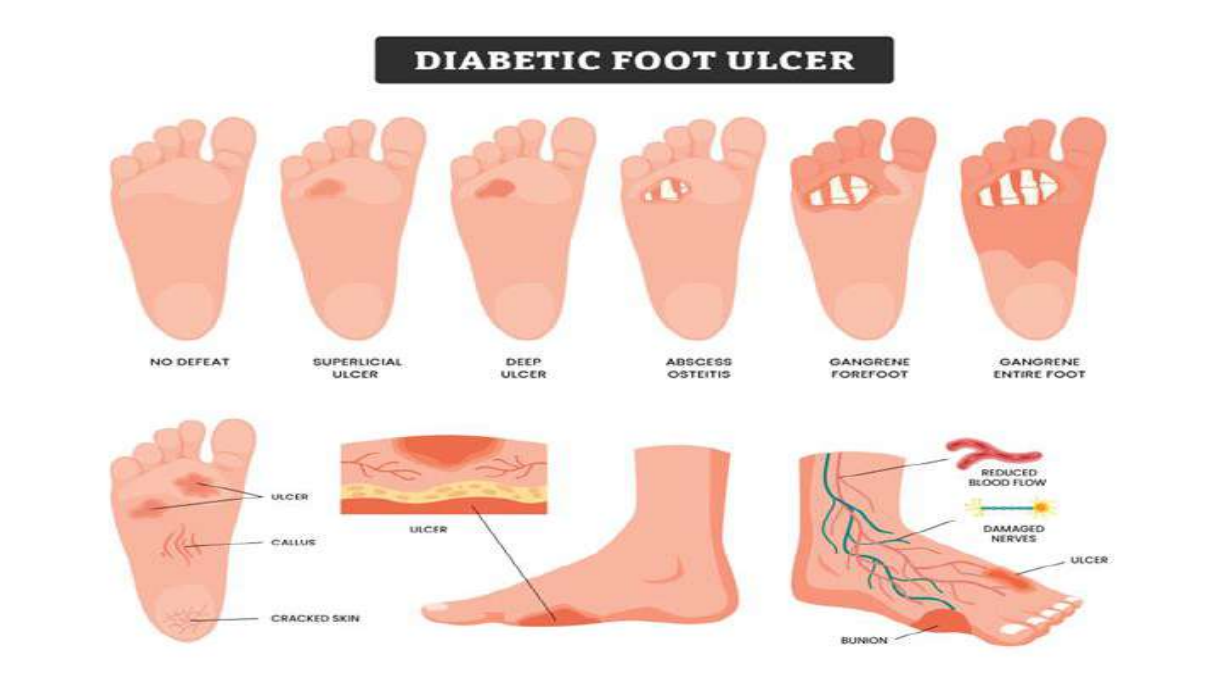
*MSSA (Methicillin-Susceptible Staphylococcus Aureus)
**MRSA (Methicillin-Resistant Staphylococcus Aureus)

§ MRSA Risk Factors that should prompt the addition of anti-MRSA to the empirical regimen

- Prior prolonged, inappropriate, or recent antibiotic use
- Prolonged or recent hospitalization, intensive care admission
- The long duration of the foot wound
- The presence of osteomyelitis
- Prior MRSA infection or colonization within the past year
- The local prevalence of MRSA is high enough (perhaps 50% for a mild and 30% for a moderate soft tissue infection)
- Severe infection and open wounds
- Invasive procedures
- HIV infection
- Admission to nursing homes
- Hemodialysis
- Discharge with long-term central venous access or long-term indwelling urinary catheter

∞ P. aeruginosa risk factors that should prompt the addition of anti-P. aeruginosa to the empirical regimen

- Patients having severe infection
- High local prevalence of Pseudomonas infection
- Hot and wet climate
- Frequent exposure of the foot to water
- Isolated from cultures of the affected site within the previous few weeks
- In a person with moderate or severe infection who resides in Asia or North Africa.



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DU&PP News
Future Fighters against AMR

As the national drug regulatory authority, the Egyptian Drug Authority (EDA) plays a pivotal role in all medication-related aspects in Egypt. A key responsibility of the EDA is to promote the optimal and rational use of medicines-particularly antimicrobials—given that this is a critical issue requiring coordinated efforts at the global, national, and organizational levels. In line with its mandate to ensure the rational use of antimicrobials and support the fight against antimicrobial resistance (AMR), the EDA continues to strengthen its collaboration with international partners, including the World Health Organization (WHO) and other relevant entities.

Pharmacy students, our ambitious future pharmacists, are key champions in advancing public understanding of antimicrobial resistance (AMR) as a global threat and burden. By empowering them, we can strengthen a culture of rational antimicrobial use within the community and develop professional, trustworthy health-awareness advocates capable of improving medication-use practices, particularly in relation to antimicrobials.

In alignment with this vision, the Egyptian Drug Authority (EDA), in collaboration with the World Health Organization (WHO) and the global ReAct network, established the "Future Fighters Against AMR" program. This initiative aims to enhance the capacity of pharmacy students from universities across Egypt by equipping them with the knowledge and practical skills needed to lead community awareness activities on the dangers of antimicrobial resistance.

The campaign was officially launched in November 2024 in the presence of Dr. Ali El-Ghamrawy, Chairman of the EDA, and Dr. Nima Abid, WHO Representative in Egypt.

The "Future Fighters Against AMR" program consists of four phases:

1. **Curriculum Development (January–July 2025):**
   Preparation of the training curriculum in collaboration with WHO and the ReAct network.
2. **Training Program and Workshops (18–22 August 2025):**
   - A total of 47 students and 22 academic supervisors participated in the training sessions.
   - Lectures and workshops were delivered by experts from the EDA, WHO, and ReAct in accordance with the scheduled program.
3. **Application and Community Service (24 August–15 October 2025):**
   - Students were divided into working groups based on their universities and supervised by academic staff.
   - Each group conducted an AMR awareness project targeting one of the following audiences:
     • The general population (including adults and school-aged children).
     • Medical students (pharmacy and other health-related faculties).
     • Non-medical university students.
4. **Project Evaluation (16 October–22 November 2025):**
   - Evaluation was conducted by three committees of EDA experts and one committee of WHO experts.
   - Each committee used a standardized evaluation rubric with a defined scoring system.
5. **Program Closure:**
   Final celebrations were held, during which the top four winning projects were announced.



The closing ceremony, held on 4 December 2025, brought together Dr. Ali El-Ghamrawy, Chairman of the EDA; Dr. Nima Abid, WHO Representative in Egypt; WHO representatives; senior leaders and staff of the Egyptian Drug Authority; deans of pharmacy faculties from universities across Egypt; and AMR experts from various sectors.

The top four projects were ranked as follows

Sphinx University (1st Rank)

British University in Egypt (BUE) (2nd Rank)

New Giza University (2nd Rank)

Delta University for Science and Technology (3rd Rank)



Future Fighters workshops

Sphinx university (1st Rank)

BUE (2nd Rank)

New Giza University (2nd Rank)

Delta University for Science and Technology (3rd rank)

DU&PP News
Pharmaceutical Care Initiatives

In this issue of the Pharmacy Practice Newsletter, we spotlight the pharmaceutical care initiatives carried out between September and November 2025. During this period, the Drug Utilization and Pharmacy Practice Administration team continued its commitment to advancing drug awareness and pharmacy training programs through targeted sessions for the public, community pharmacists, and hospital pharmacists. These initiatives included…

1) EDA Experience Exchange Hub (Triple E's Hub)

Triple E's Hub aims to reinforce national efforts by adopting a comprehensive approach to promoting and sharing best pharmaceutical practices across health institutions in Egypt. Guided by the EDA's vision and aligned with Egypt Vision 2030, the Hub places strong emphasis on building and revitalizing partnerships to support sustainable development.

The scientific meetings held in October 2025 brought together hospital and clinical pharmacists to highlight their contributions to patient care. **This session focused on clinical pharmacy interventions in breast cancer and gynecological malignancies, coinciding with October's designation as International Breast Cancer Awareness Month.** The program featured educational case studies designed to improve patient outcomes and reinforce evidence-based practices. These meetings reflect the EDA's commitment to advancing and sustaining pharmaceutical practices and services, while promoting the optimal and rational use of medications.

Aligned with Triple E's Hub strategy, these meetings emphasize the exchange of experiences in pharmaceutical practice by engaging health institutions from diverse affiliations and governorates, including both governmental and private sectors. Participants regularly present educational case studies and clinical interventions across communicable and non-communicable diseases, showcasing pharmacy practice contributions that enhance patient outcomes. The meetings also foster meaningful discussions among pharmacists, academic staff, and experts from leading health institutions across Egypt, strengthening collaboration and knowledge sharing within the profession.





DU&PP News: Pharmaceutical Care Initiatives

2) *(Safe Medication....Save Life)* Initiative

The initiative aims to raise awareness across diverse segments of society about the safe and effective use of medications, following a Society Engagement Approach. Its goal is to build healthier, better-informed communities and ensure maximum therapeutic benefits. The sessions address a broad range of topics related to non-communicable diseases, including diabetes, hypertension, respiratory conditions, proper use of inhalers, safe use of analgesics, and potential side effects of cancer medications, while also promoting the rational use of antimicrobials.

The on-site awareness campaigns are planned for public venues such as cultural centers, palaces, public libraries, sports clubs, hospital outpatient clinics, and university community service centers across various Egyptian governorates. Community sessions, held at locations including October Culture Palace, El Dokki Cultural Library, Al-Bahr Al-Aazam Cultural Library, Heliopolis Culture Palace, and Cairo University Students Cultural Library, engaged diverse audiences comprising adults, women, and students. These sessions facilitated meaningful discussions and represent a key component of the EDA's ongoing efforts to enhance drug awareness, strengthen pharmaceutical services nationwide, and promote the optimal and rational use of medications.






DU&PP News: Pharmaceutical Care Initiatives

3) *(An Aware Pharmacist, an Aware Community.)* Initiative

The initiative is designed to promote and sustain effective pharmaceutical practices while supporting continuous professional development. Launched in alignment with the EDA's vision and its strategies for capacity building and ongoing growth, the program reflects Egypt's broader commitment to advancing healthcare.

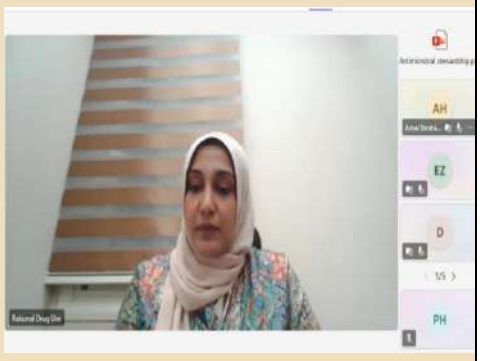
A particular focus is placed on community pharmacists, who serve as the first line of defense in public health and play a pivotal role in improving medication safety and accessibility. Training is delivered through a series of monthly online webinars organized by the General Administration of Drug Utilization and Pharmacy Practice, often featuring insights from professional experts and academic professors across diverse fields.

The lecture topics were aligned with key health occasions, including October as **International Breast Cancer Awareness Month**, **World Antimicrobial Awareness Week** (18–24 November), and **World Diabetes Day** on 14 November.

The selected topics include:

- Rational use of Antimicrobials (Part 1)
- Management of drug interactions
- Rational use of Antimicrobials (Part 2)
- Rational drug use in breast cancer
- Rational use of Antimicrobials AMR (Part 3)
- Rational drug use in diabetic patients

This comprehensive approach ensures participants receive up-to-date knowledge and best practices in the field.

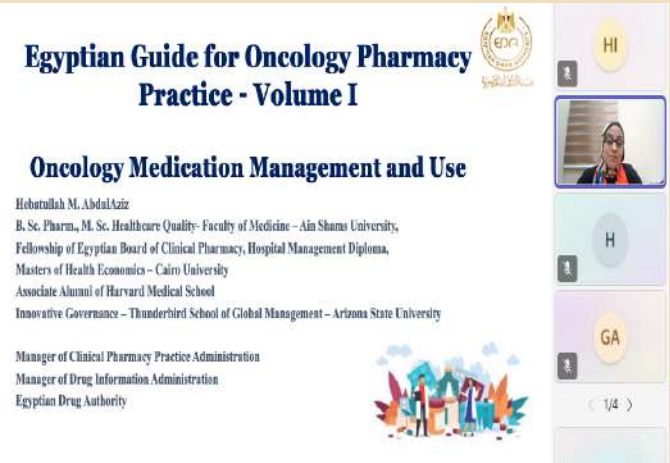


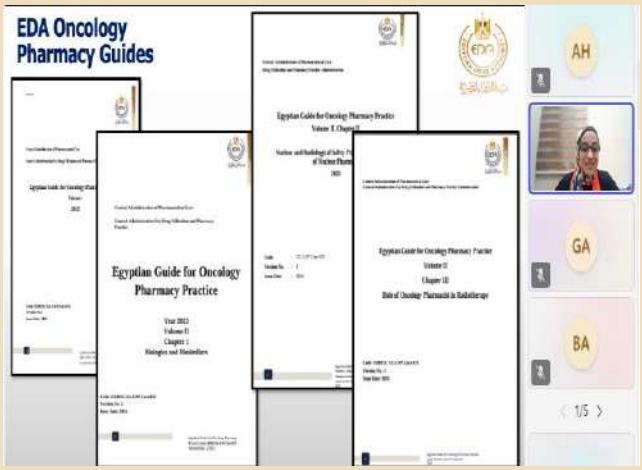
DU&PP News: Guide to Guide Approach

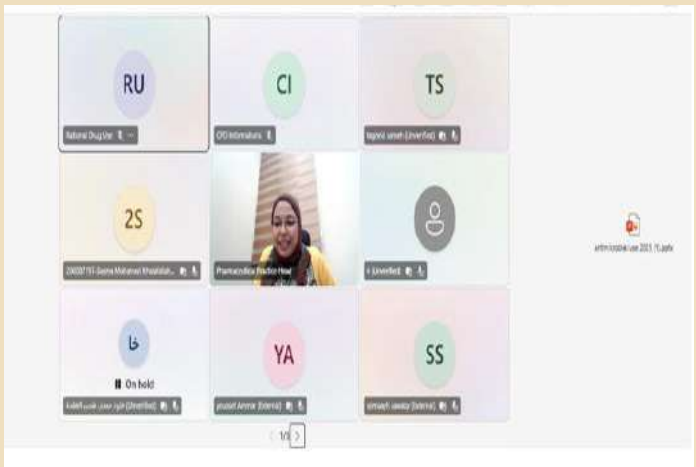
The Guide-to-Guide (G2G) initiative is designed to raise awareness among hospital and community pharmacists about the guides issued by the **General Administration of Drug Utilization and Pharmacy Practice at the EDA**. Developed based on scientific evidence and international guidelines, these resources aim to strengthen pharmaceutical practice, enhance the quality of healthcare services, and ensure patient safety.

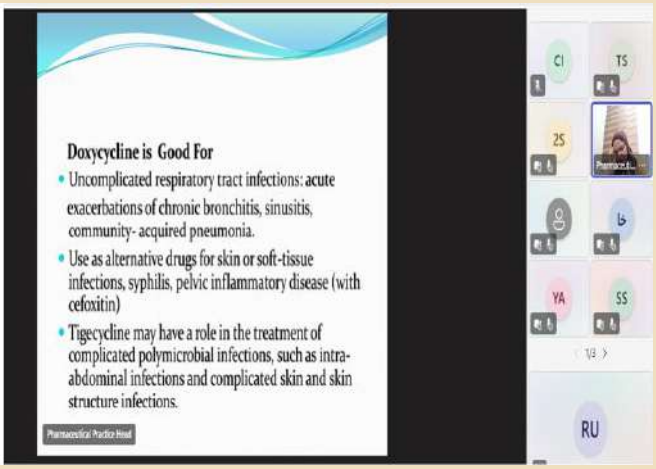
As part of this initiative, the **EDA team** organized virtual lectures to provide comprehensive briefings on previously published EDA guides. In September, the focus was on **Oncology Pharmacy Practice – Volume 1**, while in November, a collective session covered various **National Guides for Rational Antimicrobial Use**, coinciding with World Antimicrobial Awareness Week (18–24 November). These guides serve as essential references for pharmacists, supporting the implementation of evidence-based practices in antimicrobial stewardship and oncology pharmacy, and promoting the safer and more effective use of critical medicines.

All EDA guides undergo a rigorous scientific review process led by expert committees, which include distinguished faculty members from pharmacy and medicine as well as experienced healthcare practitioners. This collaborative approach ensures that the guides are clinically relevant, scientifically robust, and aligned with the latest research.









About DU&PP

The Drug Utilization and Pharmacy and Pharmacy Practice General Administration (DU&PP) is concerned with rationalizing medication use and reducing medication errors. The General Administration is also concerned with developing pharmaceutical practices, enhancing Egyptian pharmacists' skills, issuing pharmacy practice guidance, preparing national drug lists and the Egyptian drug formulary, and providing numerous training programs. It also aims to raise community awareness and promote the safe and effective use of medications by conducting awareness campaigns and pharmaceutical care initiatives among all segments of society to ensure patient safety and achieve optimal drug use. **Our publications, including clinical practice guides, newsletters, and the Egyptian National Formulary, are available at the official EDA website and can be accessed via the following hyperlinks or QR codes:**

Guides SCAN ME

Newsletters SCAN ME

Formulary SCAN ME

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Egyptian Drug Authority
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