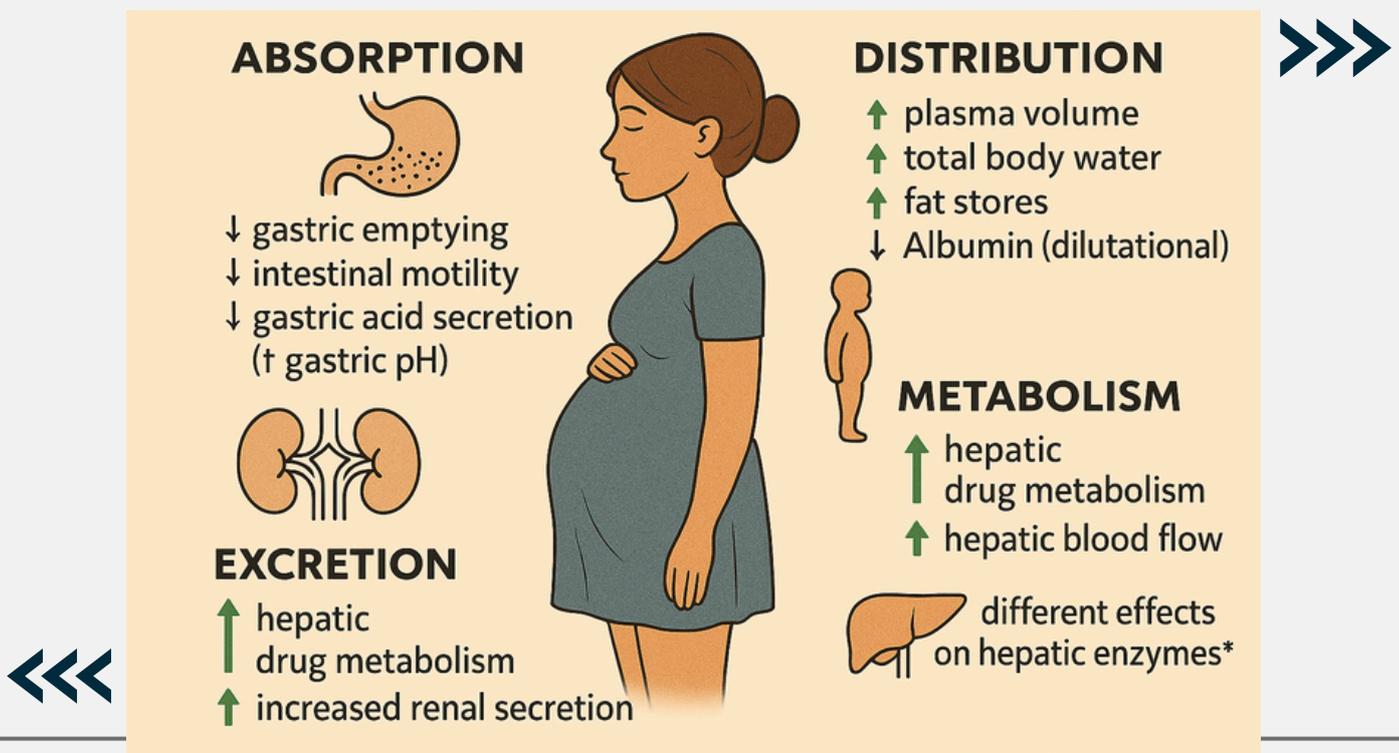**CULTIVATING THE GEMS WITHIN SPECIAL POPULATION: USING**

Pathophysiological Insights

TO GUIDE SAFER AND SMARTER ANTIMICROBIAL DOSING IN WOMEN

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Women bear a disproportionate burden of infectious diseases requiring antimicrobial treatment, ranging from urinary tract infections (UTIs) to obstetric and reproductive tract infections. Although antimicrobial therapy is typically guided by standardized dosing regimens and population-based data, one crucial consideration is often overlooked, women are not smaller versions of men. The differences in anatomy, physiology and hormonal profiles can significantly influence how women experience infections, respond to antibiotics, and develop complications from resistant pathogens. These variations are largely driven by alterations in pharmacokinetics (PK) resulting from unique pathophysiologic changes,such as pregnant women. This suggests that fixed, "one-size-fits-all" antibiotic regimens may not be optimal for women. The concern becomes even more pressing in the era of emerging resistant, compounded by limited local access to and/or availability of certain antimicrobials.

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Antimicrobial therapy during pregnancy: Challenges and Potential Opportunities

Pregnancy induces profound PK alterations that affect drug absorption, distribution, metabolism, and elimination in both the mother and the developing foetus.

Therefore, PK studies on antimicrobials in pregnant women are crucial as these pathophysiological changes can significantly influence the efficacy and safety of treatments for both the mother and the foetus. Integrating innovative approaches in PK/PD studies enhances the feasibility of obtaining accurate drug concentration–time profiles throughout pregnancy. Such approaches support the development of robust population PK models that can inform individualized and evidence-based dosing strategies for pregnant women. Ultimately, these advances will strengthen the evidence for safe and effective antimicrobial use in this vulnerable population.

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