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BEYOND EMPIRICAL ANTIBIOTIC THERAPY: DIAGNOSTIC STEWARDSHIP, RAPID DIAGNOSTICS, AND TARGETED ANTIMICROBIAL THERAPY IN PRIMARY HEALTH CARE

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Background: Antimicrobial resistance (AMR) threatens patient safety and health-system sustainability worldwide. In 2021, bacterial AMR was associated with approximately 4.71 million deaths, including about 1.14 million deaths attributable to resistance. According to the WHO Global Antibiotic Resistance Surveillance Report 2025, approximately one in six laboratory-confirmed bacterial infections in 2023 was resistant to the antibiotics assessed. Primary care is a critical setting for intervention because a substantial proportion of antibiotic prescribing occurs in outpatient practice.

Objective: To examine contemporary diagnostic stewardship, explore its integration with antimicrobial stewardship, and propose evidence-informed, context-adapted interventions for Georgia's primary healthcare system.

Methods: This narrative, evidence-informed review draws on WHO diagnostic stewardship guidance and the AWaRe framework (2025–2026), the CDC outpatient antibiotic stewardship principles, NICE recommendations, and European surveillance approaches. It considers clinical risk stratification, targeted rapid diagnostics, local resistance data, and electronic clinical decision support.

Key findings and implications: Diagnostic stewardship emphasizes selecting the right test for the right patient at the right time and translating results into appropriate clinical action. Its aim is not increased testing, but testing that meaningfully changes management. In primary care, this can help reduce unnecessary antibiotic exposure without delaying recognition and treatment of severe infections. An integrated framework is proposed for Georgia, combining syndrome-specific clinical algorithms, targeted point-of-care diagnostics, AWaRe-based prescribing surveillance, documentation of indication and duration in electronic prescriptions, regional

antibiograms, audit and feedback, and continuing professional education. Phased implementation should incorporate balancing measures for patient safety.

Conclusion: Addressing AMR requires a shift from antibiotic selection alone toward diagnostic assessment, risk stratification, and evidence-based decisions. Integrating diagnostic and antimicrobial stewardship in Georgian primary care offers a measurable strategy to improve prescribing quality and patient safety. The future of antimicrobial stewardship begins before the antibiotic.

Keywords: antimicrobial resistance; diagnostic stewardship; antimicrobial stewardship; primary healthcare; rapid diagnostics; WHO AWaRe.