Group 4: REPORT TO PLENARY ON implementation of cascade reporting

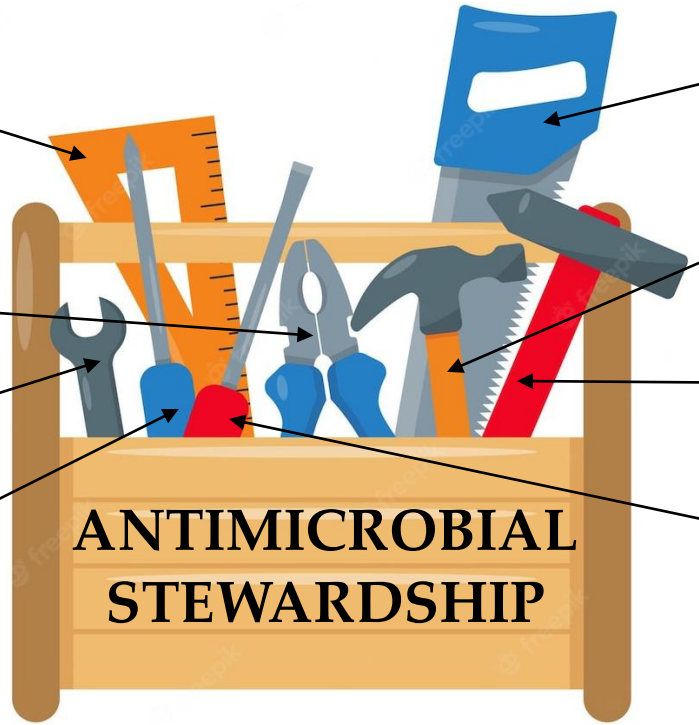
The AST Result Report Is A Powerful Tool In The Antimicrobial Stewardship Toolbox

Optimized use of diagnostic testing

Clinical decision support systems

Education

Handshake stewardship



AST result report

Audit with feedback

Treatment guidelines

Prior authorization

PAHO
Pan American Health Organization
World Health Organization Americas

PAHO 120th ANNIVERSARY

What Are Tables 1?

- Tables summarizing the suggested antimicrobial agents to test and report by organism/organism group

- The suggestions in these tables ***currently***:
  - Include agents approved by the US FDA for clinical use
  - Are directed towards clinical laboratories in the US but may be appropriate in other settings
  - Are based on the understanding that patient specific factors (eg, age, body site) or organisms specific susceptibility profiles must be considered for testing and reporting of any individual agent
  - **Need to be considered with institutional guidelines** when used to develop a laboratory's testing and reporting protocol

Our Goal: To Adapt Tables 1 for ReLAVRA+ Countries

Instructions for Use of Tables
(M100 33rd Ed.)

Instructions for Use of Tables

These instructions apply to:

- **Tables 1A through 1P::** suggested **tiers** of antimicrobial agents that should be considered for testing and reporting by microbiology laboratories. These **suggestions include clinical efficacy, current consensus recommendations for first-choice and alternative drugs, and FDA clinical indications for use.** . In other countries, placement of antimicrobial agents in Tables 1A **through 1P** should be based on available drugs approved for clinical use by relevant regulatory organizations
- **Tables 2A through 2I:** tables for each organism group that contain:
  - Recommended testing conditions
  - Routine QC recommendations (also see Chapter 4 in M02[1] and M07[2])
  - General comments for testing the organism group and specific comments for testing particular agent/organism combinations
  - Agents that should be considered for routine testing and reporting by medical microbiology laboratories, as specified in Tables 1A **through 1P** (test/report **tiers 1, 2, 3, and 4**), **including agents reported only on organisms**
- **Tables 3A through 3K:** tables describing tests to detect particular resistance types in specific organisms or organism groups

Tables 1A through 1P: suggested **tiers** of antimicrobial agents that should be considered for testing and reporting by microbiology laboratories.

Tier definitions

Tier	Definition	Test	Report	Additional Testing & Reporting Considerations
1	**Antimicrobial agents that are appropriate for routine, primary testing and reporting**	**Routine**	**Routine**	
2	Antimicrobial agents that are appropriate for routine, primary testing but may be reported following cascade reporting rules established at each institution	Routine	Cascade	Report following cascade reporting rules due to resistance to agent(s) in Tier 1 May be reported routinely based on institution-specific guidelines
3	Antimicrobial agents that are appropriate for routine, primary testing in institutions that serve patients at high-risk for MDROs but should only be reported following cascade reporting rules established at each institution	Routine or by request	Cascade	Test routinely based on institution-specific guidelines or by clinician request and report following cascade reporting rules due to resistance to agent(s) in Tiers 1 and 2
4	Antimicrobial agents that may warrant testing and reporting by clinician request if antimicrobial agents in other tiers are not optimal because of various factors	By request	By request	Test and report by clinician request due to: - Unavailability of preferred drug for clinical use - Patient underlying condition, including allergies - Unusual susceptibility profile of the organism, including resistance to agents in Tiers 1, 2, and 3 - Polymicrobial infection May also warrant testing and reporting as an epidemiological aid (e.g., testing ceftazidime for Enterobacterales to indicate potential extended-spectrum β-lactamase production)
Urine	Antimicrobial agents designated by a "(U)" in Tiers 1, 2, and 3 should be reported only on organisms isolated from the urinary tract.	Routine	Report as appropriate	Agents in Tiers 1, 2, and 3 may also be reported on urine isolates, as appropriate, following the testing and reporting guidance for the respective tiers.

Tier	Definition	Test	Report	Additional Testing & Reporting Considerations
1	Antimicrobial agents that are appropriate for routine, primary testing and reporting	Routine	Routine	
2	**Antimicrobial agents that are appropriate for routine, primary testing but may be reported following cascade reporting rules established at each institution**	**Routine**	**Cascade**	**Report following cascade reporting rules due to resistance to agent(s) in Tier 1** **May be reported routinely based on institution-specific guidelines**
3	Antimicrobial agents that are appropriate for routine, primary testing in institutions that serve patients at high-risk for MDROs but should only be reported following cascade reporting rules established at each institution	Routine or by request	Cascade	Test routinely based on institution-specific guidelines or by clinician request and report following cascade reporting rules due to resistance to agent(s) in Tiers 1 and 2
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Urine	Antimicrobial agents designated by a "(U)" in one of the Tiers 1-4 should be reported only on organisms isolated from the urinary tract.	Routine	Report as appropriate	Agents in Tiers 1, 2, and 3 may also be reported on urine isolates, as appropriate, following the testing and reporting guidance for the respective tiers.

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Urine	Antimicrobial agents designated by a "(U)" in one of Tiers 1-2 should be reported only on organisms isolated from the urinary tract.	Routine	Report as appropriate	Agents in Tiers 1, 2, and 3 may also be reported on urine isolates, as appropriate, following the testing and reporting guidance for the respective tiers.

Tier	Definition	Test	Report	Additional Testing & Reporting Considerations
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4	**Antimicrobial agents that may warrant testing and reporting by clinician request if antimicrobial agents in other tiers are not optimal because of various factors**	**By request**	**By request**	**Test and report by clinician request due to:** - **Unavailability of preferred drug for clinical use** - **Patient underlying condition, including allergies** - **Unusual susceptibility profile of the organism, including resistance to agents in Tiers 1, 2, and 3** - **Polymicrobial infection** **May also warrant testing and reporting as an epidemiological aid (e.g., testing ceftazidime for Enterobacterales to indicate potential extended-spectrum β-lactamase production)**
Urine	Antimicrobial agents designated by a "(U)" in Tiers 1, 2, and 3 should be reported only on organisms isolated from the urinary tract.	Routine	Report as appropriate	Agents in Tiers 1, 2, and 3 may also be reported on urine isolates, as appropriate, following the testing and reporting guidance for the respective tiers.

Tier	Definition	Test	Report	Additional Testing & Reporting Considerations
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Urine only	**Antimicrobial agents designated by a "(U)" in Tables 2 should be reported only on organisms isolated from the urinary tract.**	**Routine**	**Report as appropriate**	**Agents in Tiers 1, 2, and 3 may also be reported on urine isolates, as appropriate, following the testing and reporting guidance for the respective tiers.**

Creating Guidance With Selective & Cascade Reporting Rules

- Selective and cascade reporting is done to encourage appropriate antimicrobial agent use
- Introduce “nudges” in the AST report
  - Do not take away choice or mandate a specific choice
  - Structure choices in a way that makes it easier for people to make good decisions
- The positioning of drugs in Tables 1A through 1P in M100 33rd Ed. can be used to guide development of selective and/or cascade reporting rules

Selective & Cascade Reporting

Selective Reporting

- Reporting results for specific antimicrobial agents based on defined **criteria unrelated to the AST results**
- Criteria may relate to:
  - Body site
  - Organism identification
  - Clinical setting
  - Patient demographics

Cascade Reporting

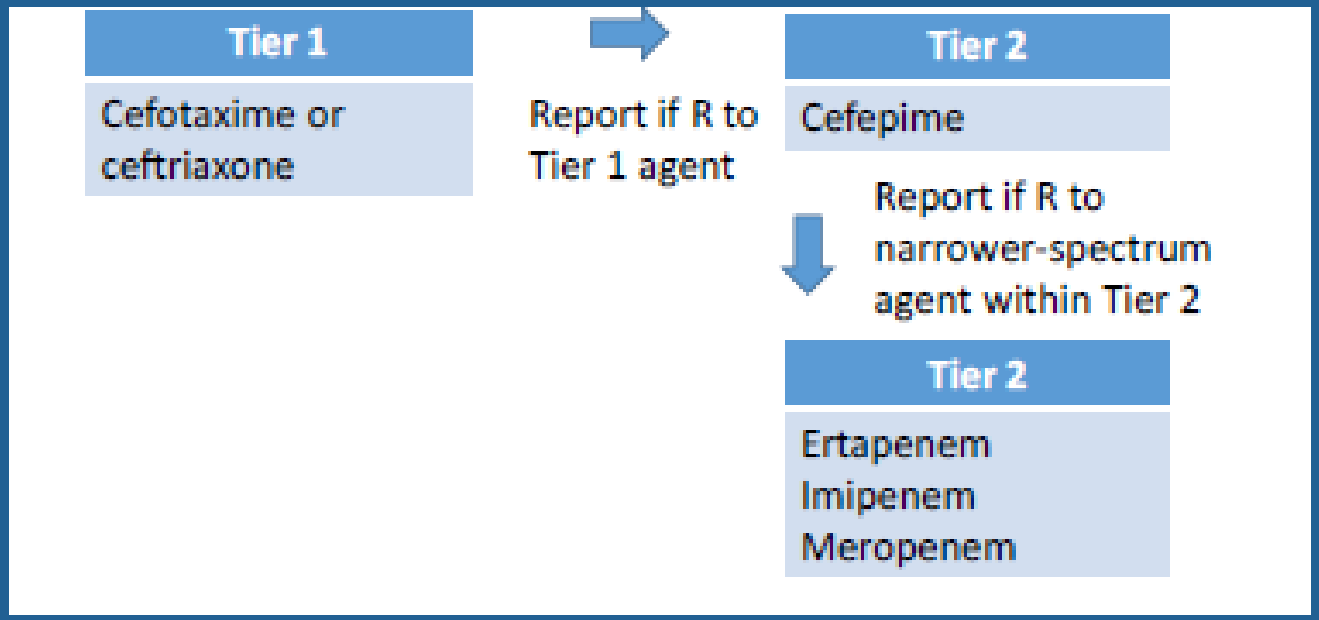
- Reporting results for specific antimicrobial agents **based on the overall AST profile** for the organism being tested
- In general, results for broader-spectrum or secondary agents are only reported if the isolate tests resistant to primary or narrower-spectrum agents in the same or similar drug class

Cascade Reporting Examples – Within Tiers (from M100 33rd Ed.)

Tier 1	Tier 2	Tier 3	Tier 4
Cefotaxime[e] or Ceftriaxone[e]	Cefepime[f]		
	Ertapenem Imipenem Meropenem	Cefiderocol Ceftazidime-avibactam Imipenem-relebactam Meropenem-vaborbactam	

Reporting Tiers & Cascade Reporting Between Tiers

- *Klebsiella pneumoniae* (Refer to Table 1A)



Cascade Reporting Examples –Between Tiers (from M100 33rd Ed.)

Tier 1	Tier 2	Tier 3	Tier 4
Cefotaxime[e] or Ceftriaxone[e]	Cefepime[f]		
	Ertapenem Imipenem Meropenem	Cefiderocol Ceftazidime-avibactam Imipenem-relebactam Meropenem-vaborbactam	

Reporting Tiers & Cascade Reporting Between Tiers

B. *Klebisella pneumoniae*
(Refer to Table 1A)

Tier 1		Tier 2		Tier 3
Cefotaxime or ceftriaxone	Report if R to Tier 1 agent	Cefepime Ertapenem Imipenem Meropenem	Report if R to Tier 1 & 2 agents	Cefiderocol Ceftazidime-avibactam Imipenem-relebactam Meropenem-vaborbactam

Process

- Review each table
- Ask –
  - What can be removed?
  - What should be added?
  - Any suggested revisions?
  - Are there country specific differences?
    - Address through footnotes

Table 1B. *Salmonella* and *Shigella* spp.[a,b]

Tier 1: Antimicrobial agents that are appropriate for routine, primary testing and reporting	Tier 2: Antimicrobial agents that are appropriate for routine, primary testing but may be reported following cascade reporting rules established at each institution	Tier 3: Antimicrobial agents that are appropriate for routine, primary testing in institutions that serve patients at high risk for MDROs but should only be reported following cascade reporting rules established at each institution	Tier 4: Antimicrobial agents that may warrant testing and reporting by clinician request if antimicrobial agents in other tiers are not optimal because of various factors
Ampicillin			
Ciprofloxacin Levofloxacin			
Trimethoprim-sulfamethoxazole			
Cefotaxime or ceftriaxone			Ertapenem[c] Imipenem[c] Meropenem[c]
	Azithromycin[d]		AZTREONAM?? (For allergic patients)
			Tetracycline[e]

Table 1C. *Pseudomonas aeruginosa*

Tier 1: Antimicrobial agents that are appropriate for routine, primary testing and reporting	Tier 2: Antimicrobial agents that are appropriate for routine, primary testing but may be reported following cascade reporting rules established at each institution	Tier 3: Antimicrobial agents that are appropriate for routine, primary testing in institutions that serve patients at high risk for MDROs but should only be reported following cascade reporting rules established at each institution.	Tier 4: Antimicrobial agents that may warrant testing and reporting by clinician request if antimicrobial agents in other tiers are not optimal because of various factors
Ceftazidime	Imipenem Meropenem	Cefiderocol	
Cefepime		Ceftazidime-avibactam	
Piperacillin-tazobactam		Ceftolozane-tazobactam	
		Imipenem-relebactam	
Tobramycin			
		Aztreonam (possibility)	
Ciprofloxacin Levofloxacin	COLISTIN?	COLISTIN?	COLISTIN?
			Aztreonam
Urine Only			
	Amikacin		

Recommended next steps from the Group

- Difficult to reach consensus – Perhaps we focus on what standard set of factors and explain the minimum conditions each country can/should use to implement the cascading testing methodology in the country and facility
  - At minimum, Tier 1 and 2 are agents on the primary test panel-
  - T1 you ALWAYS report and T2 you CASCADE report only if you see resistance to T1
  - If you see resistance to T2, then you look to T3

- May need to have each country come back with the revisions to the table, Collated by PAHO DC specifically to accommodate agents that need to be considered in different scenarios for country specific guidance
  - Focus is to set up the reporting framework for tiered use of antimicrobials that would be available for use in all countries….
  - This is the first step and more consultation is needed- Possibly in a webinar in August to work on the remaining tables that need to be reviewed

Important comments from the group/1

- Needs to help the clinician to make better decisions using some algorithm based on the appropriate adaptation of this cascading protocol in each country and facility hopefully automatically generated

- Surveillance must test the complete spectrum for national surveillance purposes- which is different from this general recommendation for use of antimicrobials
  - Not every hospital has an infectologist and the clinician might call the lad to choose an antibiotic, and the microbiologist may not understand the clinical situation- This is a general scehema or guide to help colleagues adapt this general scheme to a national context
  - Important to compliment this cascading reporting with sensitivity reports to ensure that the protocols follow the sensitivity reports from microbiology

Important comments from the group/2

- To change the behavior of prescribers will be very difficult and we will struggle with physicians who may want to work outside the system
  - Need to focus on educating the physicians in understanding how this system works- an educational module will be very important
  - Cascade for information access might also be helpful- The clinician may not need to know all the details , but the infectologist should have access to the complete information profile including the epidemiologic profile of the facility and the country as the cascade will depend on the infectious expert interpretation of all this data- This may not be helpful to the clinicians…
  - Need to also link this cascading protocol with ongoing antimicrobial stewardship programmes

- Hospitals need a system to create a report- How can you send Cascade reports?
  - Each institution will need to understand how the reporting will be done and to hold physicians accountable to follow the rules consistently and to manage the agents considered "by Request" as its use is not within the protocol of the cascading use of antimicrobial agents- This is essentially a "nudge" to encourage clinicians to use the agent as recommended
  - This depends on the facility and country to adapt these general protocols in a multidisciplinary way between microbiology, pharmacy and physicians to use antimicrobials within the logical cascade based on evidence based testing and reporting