Consensual definition of antibiotic components according to the antibiotic classification in Korean hospitals.

Consensual definition of antibiotic components according to the antibiotic classification in Korean hospitals

	CVR	Mean ± SD
Broad-spectrum antibacterial agents predominantly used for hospital-onset infections, for adult		
Amikacin (IV)	0.750	3.25 ± 0.71
Tobramycin (IV)	0.750	3.00 ± 0.53
Cefepime	1.000	4.00 ± 0.00
Ceftazidime	1.000	4.00 ± 0.00
Imipenem	1.000	4.00 ± 0.00
Meropenem	1.000	4.00 ± 0.00
Doripenem	1.000	4.00 ± 0.00
Piperacillin/tazobactam	1.000	4.00 ± 0.00
Other 4th generation cephalosporins	1.000	3.75 ± 0.46
Broad-spectrum antibacterial agents predominantly used for community-acquired infections, for adult		
Cefdinir	1.000	3.75 ± 0.46
Cefixime	0.750	3.75 ± 0.46
Cefotaxime	1.000	4.00 ± 0.00
Cefpodoxime	1.000	3.75 ± 0.46
Ceftriaxone	1.000.	4.00 ± 0.00
Ertapenem	1.000	3.88 ± 0.35
Gemifloxacin	1.000	3.75 ± 0.46
Levofloxacin	1.000	3.88 ± 0.35
Moxifloxacin	1.000	3.88 ± 0.35
Ciprofloxacin	1.000	3.88 ± 0.35
Other fluoroquinolones	0.750	3.63 ± 0.74
Other 3rd generation cephalosporins	0.750	3.13 ± 0.64
Antibacterial agents predominantly used for resistant gram-positive infections, for adult		
Linezolid	1.000	4.00 ± 0.00
Vancomycin (IV)	1.000	4.00 ± 0.00
Teicoplanin	1.000	4.00 ± 0.00
Narrow-spectrum beta-lactam agents, for adult		
Amoxicillin	1.000	4.00 ± 0.00
Amoxicillin/clavulanate	1.000	3.88 ± 0.35
Ampicillin	1.000	3.88 ± 0.35
Ampicillin sulbactam	1.000	3.88 ± 0.35
Nafcillin	1.000	3.88 ± 0.35
Cefadroxil	1.000	3.75 ± 0.46
Cefazolin	1.000	3.88 ± 0.35
Cephalexin	1.000	3.75 ± 0.46
Cefotetan	1.000	3.62 ± 0.52
Cefoxitin	1.000	3.62 ± 0.52
Cefaclor	0.750	3.63 ± 0.74
Cefprozil	0.750	3.63 ± 0.74
Other 1st generation cephalosporins	0.750	3.50 ± 0.76
Other 2nd generation cephalosporins	0.500	3.38 ± 0.92
Antibacterial agents predominantly used for extensive antibiotic resistant gram-negative bacteria, for adult		
Colistin (IV)	1.000	4.00 ± 0.00
Tigecycline	1.000	3.88 ± 0.35
Ceftolozane/tazobactam	1.000	3.75 ± 0.46

Methods: The study consisted of two series of modified Delphi studies and was performed from July to August 2019. The study 'antibiotic classification in Korean hospitals' was performed first and followed by the study 'antibiotic components according to the antibiotic classification in Korean hospitals'. Each Delphi study included two rounds of surveys in order to gather opinions and refine the information related to each study. We recruited a total of 12 panels including infectious diseases physicians (10), professor of preventive medicine (1), and the researcher of Health Insurance Review & Assessment Service (1). The questions for the Round 1 survey in each study were adopted from the antibiotic classification of the NHSN.

Results: As for the first study, the response rate of each round was 58.3% (7/12) and 75.0% (9/12), respectively. Most of the subjects of the NHSN's antibiotic classification for adults were accepted except 'antibacterial agents posing the highest risk for *Clostridioides difficile* infection' (CVR = -1.000). On the contrary, all subjects for children were rejected. Finally, a total of 6 classifications were accepted. They were i) broad-spectrum antibacterial agents predominantly for hospital-onset infections, for adult (CVR = 1.000), ii) broad-spectrum antibacterial agents predominantly used for community-acquired infections, for adult (CVR = 1.000), iii) antibacterial agents predominantly used for resistant gram-positive infections, for adult (CVR =1.000), iv) narrow-spectrum beta-lactam agents, for adult (CVR = 1.000), v) antibacterial agents predominantly used for extensive antibiotic resistant gram-negative bacteria, for adult (CVR = 1.000), and vi) total antibacterial agent (CVR = 1.000).

Conclusion: this study provides antibiotic classification for measuring antibiotic usage in Korean hospitals. This classification may guide to develop a system for measuring of antibiotic usage in each Korean hospital.

Disclosures: **All Authors**: No reported disclosures

156. Evaluating Antibiotic Use and Developing a Tool to Optimize Prescribing in a Pediatric HIV Clinic in Eswatini

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Session: P-6. Antimicrobial Stewardship: Program Development and Implementation

Background: Antibiotic resistance is an emerging global health issue, fueled by inadequate surveillance systems and the absence of antimicrobial stewardship. In resource-limited settings, antimicrobial use is often based on clinical evaluation rather than microbiologic evidence, making treatment guidelines and the education of healthcare providers paramount to ensuring appropriate antimicrobial prescribing. In a human immunodeficiency virus (HIV) clinic for children and their families in Eswatini, we sought to understand the use of antibiotics and identify specific areas for improvement.

Methods: We performed a retrospective patient chart review as part of a quality improvement (QI) initiative to assess antimicrobial use before and after implementation of a standardized antimicrobial guide. For each prescribing period, 100 random patient encounters were selected for review to observe if the indication for antibiotics, duration, and dose were consistent with World Health Organization (WHO) guidelines. Two physicians reviewed each encounter to determine the appropriateness of antibiotic use using a structured abstraction tool, with a third resolving discrepancies. Results were analyzed using a chi-square test of proportions and a structured survey was performed to assess perceptions of the guide.

Results: After the implementation of an antimicrobial guide, there was a significant decrease in the proportion of clinic visits with an antibiotic prescribed ($p < 0.001$). Incorrect indication for antimicrobial use decreased from 20.4% in the initial period, to 10.31% and 10.2% but did not reach significance (p=.0621) in the subsequent periods after implementation. Incorrect dose/duration decreased from 10.47% in the initial period to 7.37% and 3.1% in the subsequent periods, but this was also was not significant ($p = 0.139$). All prescribers who completed the survey used the antimicrobial guide and felt that it positively impacted their prescribing patterns.

Conclusion: Our study found that an antibiotic guide reduced and improved the prescription of antimicrobials. Antimicrobial stewardship is a global problem and this data demonstrates that practical solutions can have a lasting impact on antimicrobial prescribing in low resource settings.

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157. A Multidisciplinary Approach to Carbapenem Stewardship at a Large Community Hospital in Brooklyn, New York

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Session: P-6. Antimicrobial Stewardship: Program Development and Implementation

Background: Carbapenem-resistant gram-negative organisms are a continuously mounting threat, underscoring the need for effective antimicrobial stewardship interventions to improve the use of carbapenems. We sought to implement several multidisciplinary antimicrobial stewardship interventions beginning in January 2019 in an effort to reduce unnecessary meropenem use and the incidence of carbapenem-resistant gram-negatives.

Methods: Prospective audit and feedback was utilized daily in combination with weekly stewardship rounds between an Infectious Diseases pharmacist and physician in the Intensive Care Units. A second Infectious Diseases physician attended weekly interdisciplinary rounds on meropenem high-use units. Meropenem Days of Therapy (DOT) per 1,000 patient days and the incidence of meropenem resistant *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* were compared by the chi-square test of proportions.

Results: Between 2018 and 2019 the institution's meropenem DOT per 1,000 patient days decreased 33%, from 57 to 38 days per 1,000 patient days (difference, 19 days per 1,000 patient days; $p< 0.001$). In the hospital antibiogram, the meropenem susceptibility of *Pseudomonas aeruginosa* over the same time period increased from 71% to 77% of isolates (difference, 6%; $p = 0.009$). A non-significant decrease in the susceptibility of meropenem to *Klebsiella pneumonia*e was also observed from 92 to 90% (difference, 2%: $p = 0.1658$).

Conclusion: These data support the need for antimicrobial stewardship efforts targeting broad-spectrum antimicrobials such as meropenem. In the setting of a sustained decrease in meropenem use over 12 months, we observed a significant improvement in the percent susceptibility rate of *Pseudomonas aeruginosa* to meropenem for the first time in five years.

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158. A multi-site, prospective study of antimicrobial prescribing practices in three low- or middle-income country hospitals

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Session: P-6. Antimicrobial Stewardship: Program Development and Implementation

Background: Antimicrobial stewardship programs (ASPs) are being developed internationally to mitigate the misuse of antimicrobials. An understanding of current practices and prescribing patterns is necessary to determine targets to develop context-specific ASPs in low- and middle-income country (LMIC) hospitals.

Methods: We conducted a prospective study of patients admitted to the adult medical wards at three LMIC tertiary care centers in 2018- 2019: a 1,800-bed public hospital in Galle, Sri Lanka; a 991-bed public hospital in Eldoret, Kenya; and a 630-bed private hospital in Moshi, Tanzania. Information regarding antimicrobial therapy received during hospitalization, indications for antimicrobial therapy, and duration of antimicrobial use were extracted from the medical record.

Results: In total, 3150 patients were enrolled: 1297 in Sri Lanka, 750 in Kenya, and 1103 in Tanzania. Antimicrobial use prevalence varied between the three sites, with 56.0% of patients receiving antimicrobials during hospitalization in Sri Lanka, 56.5% in Kenya, and 35.4% in Tanzania. Third-generation cephalosporins were used most frequently in Kenya (70.0%) and Tanzania (73.1%), whereas amoxicillin/ clavulanic acid was used most frequently in Sri Lanka (48.4%). Lower respiratory tract infection was the most common indication for antimicrobial use in all three locations: 37.4% in Sri Lanka, 27.8% in Kenya, and 49.2% in Tanzania. No clear indication for antimicrobial use was documented among 11.6% patients receiving antimicrobials in Sri Lanka, 32.8% in Kenya, and 10.5% in Tanzania. In Tanzania, 8.6% of the patients had documentation of input from the

microbiology or infectious diseases teams compared to less than 1% in either Sri Lanka or Kenya. Pertinent culture data related to the primary indication for antimicrobials was present in 16.1% (Sri Lanka), 6.1% (Kenya), and 7.4% (Tanzania).

Conclusion: Unclear documentation for antimicrobial use was common in all three sites and most patients on antimicrobial therapy did not have pertinent culture data. Improving documentation and the capacity of the local microbiology laboratories could be initial targets for ASPs in these LMIC hospitals.

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159. A Novel Framework to Guide Antibiotic Stewardship Nursing Practice

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Session: P-6. Antimicrobial Stewardship: Program Development and Implementation

Background: In 2017, the International Council of Nurses - a federation of more than 130 national nurses associations, representing the more than 20 million nurses worldwide - issued a statement supporting the position that nurses "play a central role in patient care and interdisciplinary communication and, as such, are in a key position to contribute to reducing antimicrobial resistance and critical for the function of antimicrobial stewardship (AS) programs." Evidence suggests that frontline nurses are enthusiastic to participate in AS activities but lack context and a non-antibiotic prescriber frame of reference.

Antibiotic Stewardship Nursing Practice: The SCAN-P Framework*

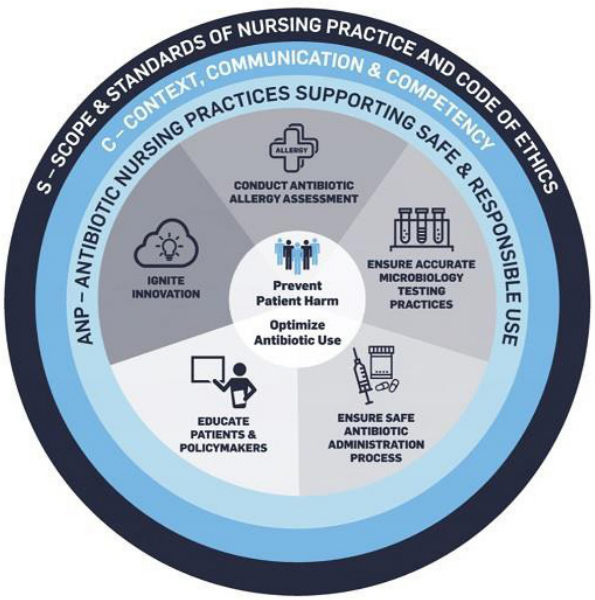

Figure. Antibiotic Stewardship Nursing Practice: The SCAN-P Framework®

Methods: Drawing from a review of the antibiotic, environmental, and social sciences stewardship literature and interviews with AS thought leaders, we developed a framework to provide context and to guide AS nursing practice and education. Over a six month period, the framework was vetted with over 30 nurse and non-nurse clinicians and critiqued by frontline nurses engaged in AS patient care activities. The framework went through more than ten iterations, resulting in the SCANP framework (shown in Figure).

Results: The novel SCANP Framework consists of three concentric circles, sharing a common core to prevent patient harm and optimize antibiotic use. The outer circle - **S** - represents scope and standards of nursing practice and nursing code of ethics. Nursing practice is guided by individual country's standards and codes. The second ring - **C** - culture and context represents organizational culture and local-level social/behavioral context. The extent to which nurses can successfully engage in AS with their interdisciplinary colleagues is highly dependent on how nursing is positioned within the organization. The third ring - **ANP** - represents current and emerging AS Nursing Practices that support the safe and responsible use of antibiotics.

Conclusion: Recommendations to expand AS programs to include nurses have generated national and international support. But nurse engagement in AS has received limited contextual attention. To fill the gap, we created a practical, globally applicable AS organizing framework to guide nurses, and leaders charged with nursing development and education, foster interdisciplinary dialogue on advancing AS endeavors.

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160. A Pre- and Post-intervention Study to Implement a Successful Antimicrobial Stewardship Program in Palliative Care

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Session: P-6. Antimicrobial Stewardship: Program Development and Implementation

Background: In patients receiving palliative care, medical interventions are transitioned away from aggressive and curative attempts to less invasive and more comfort measures. Antimicrobial usage remains a challenging subject in palliative care decisions, where many physicians focus interventions on reduction of patient pain and discomfort, without consideration for adverse effects such as the development of antimicrobial resistance or patient-specific adverse drug events. With limited data on the comfort benefit, we aimed to assess antimicrobial use in patients at the end of life in our institution as well as the success of targeted stewardship interventions in palliative care patients.

Methods: Patients who expired between November 2018 and August 2019 were assessed retrospectively for antimicrobial use during their last 14 days of life. In January 2020, a prospective stewardship initiative began in collaboration with our institution's palliative care team to focus antimicrobial interventions on patients involved in goals of care discussions.

Results: In our retrospective review of 200 patients, 139 (69.5%) of patients received antimicrobials in their last two weeks of life, with 50% having formal palliative care consultations. The most commonly used antimicrobials were piperacillin-tazobactam (64.7%) and vancomycin (60.4%), with primary indications being pneumonia (34.5%) and empiric coverage/sepsis (24.5%). Of note, 46% of antimicrobial regimens were eligible for optimization through stewardship initiatives.

From January through February 2020, sixteen stewardship interventions were made on thirteen palliative care patients, with an 81.3% acceptance rate. Duration of therapy based on indication and discontinuation of antibiotics following transition to comfort measures only were the most frequent interventions made.

Table 1. Baseline Characteristics

Table 1. Baseline Characteristics – Pre-intervention			
	All (n = 200)	No antimicrobials (n = 61)	Received antimicrobials (n = 139)
Age, median (IQR)	74 (61 – 82)	74 (60 – 82)	74 (61 – 82)
Male, n (%)	91 (45.5)	29 (47.5)	62 (44.6)
Race, n (%)			
Black	177 (88.5)	52 (85.2)	125 (89.9)
White	11 (5.5)	5 (8.2)	6 (4.3)
Latino	3 (1.5)	0	3 (2.2)
Asian	2 (1)	0	2 (1.4)
Undisclosed	7 (3.5)	4 (6.5)	3 (2.2)
Code status on admission			
Full Code	160 (80)	46 (75.4)	114 (82)
DNR/DNI	40 (20)	15 (24.6)	25 (18)
Length of stay, median (IQR)	9 (6 – 16)	8 (5 – 14)	10 (6 – 17)
Palliative care consult, n (%)	100 (50)	34 (55.7)	66 (47.5)
Advancement of code status, n (%)			
To DNR/DNI	68	21	47
To CMO	40	14	26

Table 2. Antimicrobial Usage - Pre-intervention

Table 2. Antimicrobial usage – Pre-intervention (n = 139)	
Days of therapy (DOT), median (IQR)	9.5 (6 – 14)
Median DOT with palliative care consult	8.5 (6 – 13)
Median DOT without palliative care consult	10 (7 – 14)
Indications, n (%)	
Bacteremia	14 (10.1)
Cellulitis	10 (7.2)
Empiric/Sepsis	34 (24.5)
Intraabdominal	11 (7.9)
Osteomyelitis	2 (1.4)
Pneumonia	48 (34.5)
Urinary tract infection	20 (14.4)
Route of administration, n (%)*	
Intravenous (IV)	138 (99.3)
Both intravenous (IV) and oral (PO)	10 (7.2)
Oral (PO)	1 (0.72)
Specific antimicrobials	
Ampicillin	1 (0.72)
Ampicillin-sulbactam	8 (5.8)
Azithromycin	26 (18.7)
Cefazolin	2 (1.4)
Cefepime	16 (11.5)
Ceftazidime	1 (0.72)
Ceftolozane-tazobactam	1 (0.72)
Ceftriaxone	33 (23.7)
Clindamycin	3 (2.2)
Daptomycin	2 (1.4)
Doxycycline	1 (0.72)
Fluconazole	5 (3.6)
Levofloxacin	8 (5.8)
Linezolid	5 (3.6)
Meropenem	11 (7.9)
Metronidazole	21 (15.1)
Micafungin	5 (3.6)
Nafcillin	3 (2.2)
Piperacillin-tazobactam	90 (64.7)
Vancomycin	84 (60.4)
Optimization of therapy	
Regimen optimal, n (%)	75 (54)
Regimen not optimal, n (%)	64 (46)
Potential interventions, n = 64	
Asymptomatic UTI	4 (6.3)
Choice of agent	11 (17.2)
De-escalation possible	21 (32.8)
Duplicate coverage	1 (1.6)
Duration	2 (3.1)
Empiric without indication	20 (31.3)
Unnecessary coverage	5 (7.8)