

Background

- Global antimicrobial consumption is growing dramatically, especially in low-middle income countries.¹
- Overuse and misuse of antibiotics is linked to increased antibiotic resistance, leading to higher mortality and healthcare costs.²
- In resource-limited settings, antimicrobial prescribing is challenging due to stockouts, lack of microbiological evidence, and differing levels of provider education.

Objectives

- Investigate antimicrobial prescribing patterns at an outpatient HIV clinic for children and their families.
- Determine whether a standardized “antimicrobial guide” and targeted provider education can impact negative prescribing patterns.

Methods

- An antimicrobial guide was created to match the most common diagnoses and medications used at the clinic.
- We conducted a retrospective review of patient encounters where antibiotics were prescribed, before and after the implementation of the antimicrobial guide and provider education.
- The patient encounters were reviewed for the indication for antibiotics, dose, and duration as compared to WHO guidelines.



Figure 1. Baylor Eswatini Center of Excellence³

Skin and soft tissue infections (infected mosquito bites, etc.)
Duration: Usually treat for 7 days, or two days after signs of infection (erythema, pain, heat) have resolved
**Clindamycin or doxycycline preferred agent if you suspect *Staph aureus* (abscesses, recurrent skin lesions, previously failed treatment)

Cloxacillin

- Pediatrics: 15-25 mg/kg/dose QD (50 to 100 mg/kg/day divided every 6 hours, up to 500 mg/dose)
- Adults (>20 kg): 500 mg every 6 hours

Amoxicillin (if not purulent/abscess, amoxicillin CAN be used, but cloxacillin is preferred)

- Pediatric: 50 mg/kg/dose, BD
- Adults (max dose): 500 mg BD

Clindamycin

- Pediatrics: 30 mg/kg/day PO divided TD; max 450 mg/dose
- Adults (max dose): 450 mg TD

Co-trimoxazole (not preferred if patient has been on cotrim recently, avoid in third trimester of pregnancy and neonatal period)

- Pediatrics: 25 mg/kg/dose, BD
- Adults (max dose): 160/800 BD

Doxycycline (not recommended for children under 8 years, not for use in pregnancy)

- Children: 2 mg/kg/dose BD
- Adults (over 12 years, max dose): 100 mg BD

Figure 2. Excerpt from antimicrobial guide

| Patient Characteristic | Period 1 | Period 2 | Period 3 |
|--|---------------------|--------------------|---------------------|
| Mean age, all encounters | 22 years | 24 years | 24 years |
| Mean age, antibiotic encounters | 26 years | 28 years | 29 years |
| Age range, all encounters | 6 days to 88 years | 6 days to 91 years | 6 days to 89 years |
| Age range, antibiotic encounters | 33 days to 84 years | 8 days to 73 years | 20 days to 79 years |
| Proportion female, all encounters | 59.70% | 61.33% | 61.29% |
| Proportion female, antibiotic encounters | 66.54% | 71.20% | 69.96% |

Table 1. Patient demographics by prescribing period

| Antibiotic | Indication Documented | (Y/N) | Duration (Y/N) | Notes |
|--------------------|-------------------------------|-------|----------------|--|
| Amoxicillin | Cough, one week | Yes | Yes | Extended duration (7 days instead of 5) but within reasonable window |
| Erythromycin 250mg | LRTI, atypical | Yes | Yes | With Amoxicillin course |
| Metronidazole | Diarrhea | No | Yes | Diarrhea of only one day duration |
| Azithromycin | Pertussis, atypical pneumonia | Yes | Yes | No issues |
| Doxycycline | Lower abdominal pain syndrome | Yes | No | Did not include ciprofloxacin or ceftriaxone per guidelines |
| Metronidazole | STI syndrome | Yes | No | Prescribed metronidazole for 7 days instead of 2g PO x1 |
| Metronidazole | Genital ulcer | No | NA | |
| Ciprofloxacin | Urethral discharge | Yes | Yes | Noted addition of acyclovir for herpes |
| Amoxicillin | Pneumonia, RLL consolidation | Yes | Yes | |
| Ceftriaxone | Vaginal discharge | Yes | Yes | |
| Cloxacillin | Skin infection | Yes | No | Needs QID dosing |
| Metronidazole | Human bite wound | No | NA | |
| Erythromycin | Genital ulcer | Yes | Yes | Noted in Rx |
| Doxycycline | Vaginal discharge | Yes | No | Incorrect metronidazole dosing |
| Clarithromycin | H.pylori eradication | Yes | Yes | |

Table 2. Excerpt from chart review

| Assessment | Period 1 | Period 2 | Period 3 |
|---------------------------------------|----------------|----------------|----------------|
| Encounters without indication | 7% (7/100) | 3% (3/100) | 2% (2/100) |
| Incorrect antibiotic indication | 20.43% (19/93) | 10.31% (10/97) | 10.20% (10/98) |
| Incorrect antibiotic dose or duration | 10.47% (9/86) | 7.37% (7/95) | 3.10% (3/97) |

Table 3. Summary of assessments of encounters involving antibiotic prescriptions by prescribing period. Note that some assessments are not out of 100 due to removal of “no indication” or “not applicable” data points

Results

- Total encounters where an antibiotic was prescribed dropped from 9.83% to 6.99% and 7.02% after guide implementation ($p < 0.001$).
- Encounters with incorrect antibiotic indication dropped from 20.43% to 10.31% and 10.20% ($p = 0.062$) and incorrect dose or duration dropped from 10.47% to 7.37% and 3.10% ($p = 0.139$) (Table 3).
- All surveyed prescribers stated the guide had a positive impact on their prescribing patterns. Pharmacists felt that it substantially decreased the number of calls they made to providers to correct prescriptions.

Conclusions

- We showed a sustained, statistically significant decrease in patient encounters where antibiotics were prescribed after the implementation of the antimicrobial guide.
- No significant decrease in incorrect antibiotic prescription was observed, which may be due to lack of power/small sample size
- A larger study, possibly focusing on distinct age ranges (pediatrics or adults) may show a more significant impact.

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