

ADHERENCE TO LOCAL ANTIBIOTIC PRESCRIBING GUIDELINES WITHIN 48 HOURS OF PATIENT ADMISSION

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1. Background and Importance

Optimal antibiotic (ATB) administration is essential for infection treatment effectiveness, minimization of ATB adverse events and fighting against ATB resistance. An ATB stewardship program (inaccurately translated as ATB policy) can help clinicians to rationalize ATB prescribing, increase the success rate of infection treatment and reduce the incidence of treatment failure. There is no simple and effective tool. In 2022, for the first time, we conducted an adherence audit with **institutional local guidelines** (LG) for the treatment of the most common infections.

2. Aims and Objectives

This study aimed to evaluate the level of clinicians' adherence to LG in terms of ATB prescribing and administration in inpatients in an acute tertiary care hospital setting.

3. Materials and Methods

We evaluated 74 inpatients (the initial aim was at least 50 patients) admitted to the University Hospital through the Emergency Department with ATB therapy initiated within the first 48 hours of admission during **November 1-15, 2022**.

Study design: Prospective single-centre audit for prescribed ATB treatment adherence to LG. Adherence to LG (Initial empiric ATB therapy guideline, Surgical site prophylaxis guideline, Immunocompromised patient infection therapy and prophylaxis guideline). Where there is no LG, clinical microbiologist assessed the appropriateness of prescription per lege artis principle. The prescribed ATB were collected using the adopted audit tool.¹

The audit team: Clinical microbiologist, clinical pharmacists and a quality management representative.

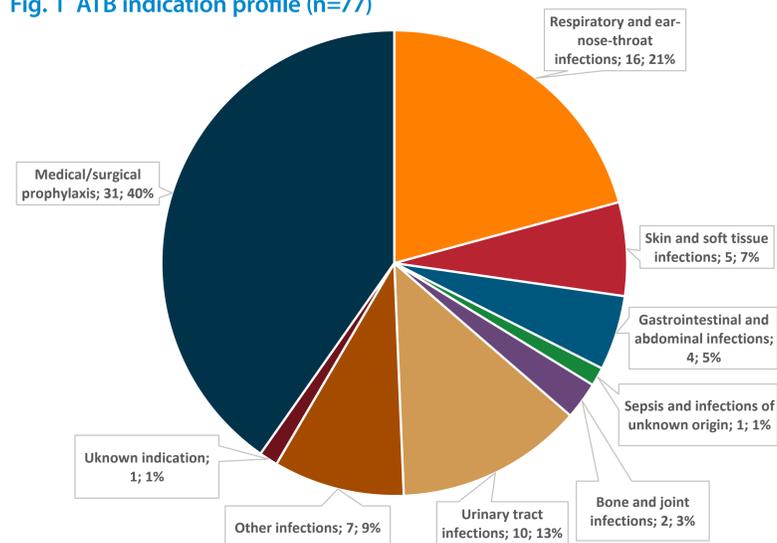
Data collection and evaluation: We obtained data from the hospital's electronic prescribing system: patient details, weight, renal function, allergy status, date and reason for admission, details on infection, blood cultures taken before ATB therapy, focus of infection, ATB indication, ATB administration details, length of treatment, documented review of ATB treatment efficacy within 3-5 days of therapy, therapeutic drug monitoring when relevant, change of ATB treatment/reason. All patients were followed for ATB pharmacotherapy prescription throughout their entire hospital stay.

Adherence was assessed as **full compliance** with LG. **Partial adherence** was attributed when minor deviation from LG occurred (e.g. ATB dose, dosing interval, duration of ATB infusion, absence of ATB indication review by 5 days of ATB initiation). **Nonadherence** was defined as an incorrect choice of ATB.

Exclusion criteria: Patients on long-term ATB prophylaxis were excluded. Paediatric population.

Data analysis: MS Excel for descriptive data analysis.

Fig. 1 ATB indication profile (n=77)



4. Results

Within a two-week audited period, there were **1842 new admissions** via Emergency Department of University Hospital.

• ATB were initiated within 48 hours in **478 inpatients (26.0%)**.

ATB indications:

- A total of **74 patients** with **93 ATB agents** were audited and **77 indications** for newly prescribed ATB therapy were found (see Fig. 1).
- Most frequently amoxicillin-clavulanate, ceftazolin and cefotaxime were prescribed.
- 46 patients (**62.2%**) received ATB for **indications where institutional LG exist**.
- The **full adherence** to ATB LG was observed in **33 indications (71.7%)**.
- **Partial adherence** was found in **11 indications (23.9%)**.
- **Non-adherence** was shown in **2 indications (4.3%)**. These involved ATB for surgical site prophylaxis.
- **Non-lege artis initial ATB prescribing** was identified in 4 indications (**5.2%**) of 77 indications.

ATB administration:

- Incorrect administration of ATB (length of infusion or not numbering ATB days of therapy) were the most frequent reasons for **partial and non-adherence (22,5%)** (see Tab. 1).
- There was **nil nonadherence** in ATB administration found neither in ATB dosing nor dosing frequency.
- Improvement can be made in promoting review of ATB treatment within 5 days.

5. Conclusion

Enforcing the principles of ATB stewardship is a complex and long-term process requiring considerable joint effort. The main tools include regular ATB audit and feedback. **Adherence in 71.7% of prescribed ATB agents with recommended practices is considered a satisfactory outcome.** Clinical pharmacist can still improve formal ATB prescription in one fifth of cases. The audit results were presented to the management of University Hospital and shall be repeated in future within 5 years. In future ATB audit will be refined and assisted with AI tools.

References:

1. Hood G et al. Measuring Appropriate Antibiotic Prescribing in Acute Hospitals: Development of a National Audit Tool Through a Delphi Consensus. *Antibiotics (Basel)*. 2019 Apr 29;8(2):49.

Acknowledgements: This study was supported by Charles University grant SVV 260 665.

Disclosure of Interest: None to declare

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Table 1. Adherence to appropriate ATB administration in audited patients

Audit criteria	Adherence	Partial adherence	Non-adherence	Not applicable	Total
Correctly selected ATB dose and administration interval	89 (95.7%)	4 (4.3%)	0 (0.0%)	0 (0.0%)	93 ATB (100.0%)
Appropriate prescription of ATB (numbering, dilution, length of intravenous administration)	59 (63.4%)	1 (1.1%)	20 (21.5%)	13* (14.0%)	93 ATB (100.0%)
Evaluation of ATB administration after 3-5 days	30 (32.3%)	0 (0.0%)	20 (21.5%)	43** (46.2%)	93 ATB (100.0%)
Therapeutic drug monitoring applied and appropriate adjustment in prescription made	2 (2.2%)	0 (0.0%)	0 (0.0%)	91*** (97.8%)	93 ATB (100.0%)
Were samples taken for culture prior to administration of ATB?	29 (37.7%)	0 (0.0%)	14 (18.2%)	34**** (44.1%)	77 indications (100.0%)

*No numbering needed for long-term ATB therapy or prophylactic indication

**Evaluation of ATB administration was not performed due to: prophylactic indication, short administration of ATB <3 days, withdrawal, long-term therapy of chronic infections.

***Therapeutic drug monitoring applicable only to agreed ATB agents

****In ATB prophylaxis blood cultures are not indicated

