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### Evaluation of Antibiotics Timeout Tool as a Safety Program for Improving Antibiotic Utilization in a Secondary Care Hospital in Ras Al Khaimah, UAE

Author: Nada Ahmed Ali Al Dhanhani<sup>1</sup>

<sup>1</sup> Emirates Health Services (EHS) , Dibba Hospital

[Nada.dhanahni@ehs.gov.ae](mailto:Nada.dhanahni@ehs.gov.ae)

**Background and aims:** Inappropriate prescription and the overuse of broad-spectrum antibiotics, in addition to the continuation of therapy beyond the recommended time period could increase the risk of adverse effects and promote the emergence of resistant organisms. Antimicrobial stewardship program (ASP) is an increasingly common intervention for optimizing antimicrobial therapy in healthcare settings. The program aims to improve patient care and limits the emergence and spread of multidrug-resistant organisms by supporting judicious antimicrobial use. Antibiotics timeout tool is one of the interventions among the different methods available for reduction of inappropriate antimicrobial prescriptions in hospitals because it requires all clinicians to review antimicrobial use 48–72 hours after initiation of medication. The present study is undertaken to evaluate the effectiveness of the newly implemented electronic tool timeout on the management of antibiotic prescription and duration of treatment in a secondary care hospital in Ras Al Khaimah.

**Methods:** This study was a retrospective and prospective quasi-experimental study pre and post implementation of timeout intervention, including inpatients who received one or more systemic antibiotics. All patients who were admitted to the wards of the secondary care hospital, who were administered antibiotics and who undergone clean or clean-contaminated major operations were included in the study. It's compared the prescribing practice of antibiotic, including surgical prophylaxis for clean, clean-contaminant and contaminated surgical procedures three months prior and three months after the implementation of timeout

tool implementation. The prospective and retrospective data collection period prior to the implementation of timeout intervention was for the months of December 2019 and January to February 2020. While data was collected prospectively for the months of November to December 2021 and January 2022 for post local hospital timeout tool implementation period.

**Results:** Among the 661 patients enrolled, 324 patient's data were collected for prior and 337 for post intervention period. 422 (63.8%) patients were males and 239 (36.2%) were females. The median IQR age was 7.00 (interquartile range [IQR], 1.00-33.00). majority (212;65.4 %) were UAE nationals, followed by non- Arab nationalities (56, 17.3%), who were from countries like India, Pakistan, Bangladesh, Nepal, Afghanistan, Philippine, Indonesia, Somalia, Eretria, Chad, Italy, Uzbekistan and Denmark. Forty two (13 %) patients were from different Arab nationalities which included Yemen, Syria, Palestine, Jordan, Egypt, Morocco, Comoros and Sudan and 14 (4.3%) were from GCC (Oman). Of the 233 (35.2%) surgical procedures performed, 67 (10.1%) was orthopedic surgeries. Appendectomy accounted for 47 (7.1%) of the total surgical procedures, followed by incision and drainage of abscess (22; 3.3%), ear, nose and throat surgeries (17; 2.6%) and bariatric procedures (12; 1.8%). Other surgical procedures (67; 10.1%) . Total adherence to surgical prophylaxis was 83.3 (57.8%) with point estimate 95% CI 0.5791. In post intervention period the mean total adherence was 34 (52.3%) with point estimate 95% CI 0.5306 which was lower than that of pre intervention period (49.3; 62%) with point estimate 95% CI 0.6243. The most common reason for nonadherence to the surgical prophylactic antibiotic was due to the time out intervention was not give notification the physicians regarding the empirical therapy and not for the surgical prophylactic therapy. Total median antibiotics consumption measured by DOT was 4 (IQR 3.00–5.00), while the DOT/1000 total median antibiotics was 0.0040 (IQR 0.003–0.005). There was a decline in the cumulative number of hospital antibiotic days of therapy for prior vs post intervention (1398 days vs. 1299 days) and the antibiotic days of therapy per 1000. The total cost of antibiotics during the current study was AED 64616.37, out of which AED 28748.97 was spent before the intervention and AED 35867.41 during the intervention period. The median total cost was AED 54.184 (IQR 41.52-103.80). There was a significant difference in cost reduction prior and post the intervention ( $p$ -value  $<0.000$ ). The intervention also decreased the cost of other watch antibiotics vancomycin (AED 1288.17 vs. 165.15) and clarithromycin (AED 1301.48 vs. 1065.75) and the access antibiotics amoxicillin and clavulanic acid (AED 8187.24 vs. 6858.74). However, the cost of many medications has increased post intervention, which lead to increase in the total cost

**Conclusions:** In this study we are implementing the antibiotic time out tools. After following the implementation of electronic ATO process, a wide range of patients experienced considerable drops in total hospital costs and overall DOT for frequently prescribed antibiotics. This procedure offers a practical plan for implementing a sizable ATO as an add-on to an ASP. It also highlights the role of clinical pharmacist in implementing the stewardship interventions and in improving the adherence rate to the national guidelines in Ras Al Khaimah in particular and UAE in general.