

1 **Time efficiency assessment of antimicrobial stewardship strategies**

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14 **Keywords:** antimicrobial, antibiotic, stewardship

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16 **Running title:** Time efficiency of antimicrobial stewardship

17 To the Editor – We read with interest the recent manuscript in *Clinical Infectious Diseases* by Tamma  
18 et al that focused on the efficacy of different antimicrobial stewardship methods, demonstrating  
19 that post-prescription review with feedback (PPRF) was more effective at reducing antimicrobial  
20 consumption over time than pre-prescription authorisation [1]. The study was performed on medical  
21 inpatients, but hospitals contain many other cohorts, such as surgical inpatients, where antimicrobial  
22 use is also high and often inappropriate [2]. PPRF can take many forms but is invariably both human  
23 resource- and time-intensive. Many hospitals may lack the resources to initiate this level of  
24 stewardship universally [3,4], and therefore, there is a need to identify the form of PPRF that most  
25 efficiently impacts inappropriate antimicrobial prescribing [5,6].

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27 We performed a prospective, observational study that compared different forms of PPRF: ward round  
28 reviews on acute medical wards, ward round reviews on surgical recovery wards and telephone  
29 reviews to clinical teams caring for patients receiving carbapenems, cephalosporines or quinolones.  
30 Each stewardship review episode was performed by 2 microbiologists and a pharmacist, who collected  
31 no more data than needed for routine practice and were not aware that the data would be used  
32 comparatively in the study. Each form of stewardship occurred daily for 45, 90 and 60 minutes  
33 respectively, and there was no overlap in the patients reviewed. All antimicrobial prescriptions  
34 reviewed were quantified and any intervention recorded, defined as a change to antimicrobial  
35 prescription, including starting or stopping a medicine, as well as modifying their duration or  
36 administration. For the purpose of comparison, we considered telephone stewardship to be the  
37 control group. We calculated both the proportion of reviews resulting in an intervention and the rate  
38 of intervention per hour of stewardship across each of the three stewardship modalities.

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40 A total of 1,928 antimicrobial prescriptions were reviewed. Both surgical (37.24%) and medical (9.35%)  
41 stewardship ward rounds resulted in a significantly higher proportion of interventions compared to

42 telephone reviews (4.34%) (Table 1). However, after controlling for time, the rate of interventions per  
43 hour was higher for medical stewardship rounds (2.26 interventions/hour) compared to both surgical  
44 rounds (1.70 interventions/hour) and telephone rounds (0.48 interventions/hour) (Table 1).

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46 In conclusion, our study supports the observations made by Tamma et al that hospital ward based  
47 PPRF, though resource intensive, is an effective form of antimicrobial stewardship. We extend their  
48 findings by raising the importance of time efficiency, demonstrating that whilst surgical patient  
49 stewardship rounds result in a high absolute number and proportion of interventions, they are labour  
50 intensive and that medical ward rounds resulted in a similar number of interventions per hour of  
51 stewardship time. Both approaches were significantly better than telephone stewardship in terms of  
52 both the proportion and rate of stewardship interventions. We propose that other hospitals looking  
53 to assess and prioritise the impact of their stewardship programs should also incorporate a  
54 standardised time-based measure of stewardship efficiency.

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## 56 Funding

57 This work was supported by the Wellcome Trust (WT101766/Z/13/Z to GP).

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