

## ANTIFUNGAL STEWARDSHIP AT A LONDON TEACHING HOSPITAL ACHIEVES SUSTAINED COST REDUCTION OVER 3 YEARS WITHOUT COMPROMISING MICROBIOLOGIC AND CLINICAL OUTCOMES

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### Introduction

Antibiotic stewardship programmes have reduced inappropriate antimicrobial use, improved outcomes and limited emergence of resistance. Due to rising costs and frequent empiric prescribing, interventions targeting antifungals are gaining ground. In 2009/10 St George's NHS Trust had an annual antifungal expenditure of £1 million. An audit showed antifungals were initiated appropriately but subsequent review was sub-optimal. In October 2010 we initiated weekly antifungal stewardship rounds with prospective evaluation of clinical and financial outcomes.

### Objectives

1. Optimise care of patients with invasive fungal infections (IFIs)
2. Stop unnecessary empiric treatment
3. De-escalate antifungal therapy, when appropriate
4. Ensure therapeutic drug monitoring (TDM) performed when indicated and therapy modified according to results
5. Reduce antifungal usage and expenditure, without compromising clinical outcomes or resistance rates

### Methods

From October 2010-September 2013, adult inpatients receiving antifungals (amphotericin B, echinocandins, IV fluconazole, flucytosine, posaconazole or voriconazole) were reviewed weekly by an Infectious Diseases Consultant and Antimicrobial Pharmacist. Demographics, diagnostics, drug, indication, advice given, whether followed, and in-hospital mortality were prospectively recorded. Antifungal consumption and expenditure data were monitored using the pharmacy dispensing system. Data on number, speciation and susceptibility for all episodes of Candidaemia was obtained from Microbiology databases.

### Results

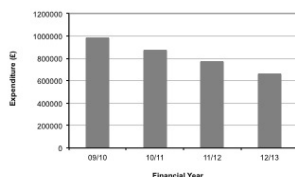
195 patients (median age 53, range 16-86) were seen 370 times (average 3.2 per week). Almost a third (29%) were under the care of Haematology and the most commonly reviewed drug was AmBisome® (29%). Prescribing was commonly empiric (33%) and of those patients only 3% were found to have proven or probable IFI. Interventions were common (n=334) with a high acceptance rate (81%, figure 1a). Expenditure reduced significantly over the 3-year period from an average of £95,000/month in the 6 months preceding the intervention to £51,000/month in the final 6 months of the project (figure 1b), equating to an annual reduction in expenditure of £330,000.

Figure 1a: Advice given on ward round (370 reviews of 195 patients)

| Advice Given               | Advice Accepted  | Advice not accepted | NA*            | Total      |
|----------------------------|------------------|---------------------|----------------|------------|
| Switch to alternative drug | 47               | 17                  | 2              | 66         |
| TDM                        | 46               | 8                   | 3              | 57         |
| Stop                       | 28               | 4                   | 0              | 32         |
| Duration recommended       | 28               | 4                   | 0              | 32         |
| Adjust dose                | 30               | 0                   | 0              | 30         |
| IV to PO switch            | 20               | 3                   | 0              | 23         |
| Diagnostics                | 30               | 4                   | 3              | 37         |
| Other**                    | 48               | 4                   | 5              | 57         |
| <b>Total</b>               | <b>271 (81%)</b> | <b>44 (13%)</b>     | <b>19 (7%)</b> | <b>334</b> |

\*Advice followed with NA if patients died prior to advice being relevant or if plans for medical therapy/ADRs were not required. \*\*Other advice included advice on concomitant antibiogram (n=11), managing ADRs (12), monitoring response to therapy (6), adjunct treatment advice (line removal or weaning immunosuppressants) (7), escalation.

Figure 1b: Total Antifungal Expenditure by Year



In-patient mortality was 23% compared to 38% in the pre-intervention period. Candidaemias remained stable in number (20-30/year), ratio of albicans to non-albicans sp (37-59%) with low rates of fluconazole resistance (5-12%) throughout the intervention period with no resistance to echinocandins observed

### Conclusion

By providing specialist input to streamline diagnostics and optimise antifungal prescribing, our weekly antifungal stewardship rounds commonly limited treatment duration and encouraged an IV-oral switch, resulting in a sustained downward trend in expenditure throughout the first 3 years without compromising microbiologic or clinical outcomes. This stands in stark contrast to rising expenditure trends in London and the UK as a whole. Savings of >£100,000/year were made with 3h of Consultant and Senior Pharmacist time per week. With relevant on-site expertise, this model is readily implementable by other large hospitals with high numbers of at risk patients and antifungal expenditure.