

CE IN THE MORNINGS

A Tradition of Outstanding Pharmacy Education

Antimicrobial Stewardship in Health Systems: Additional Insight from an Expert

A multidisciplinary team approach to antimicrobial stewardship in health systems was the subject of one of four CE in the Mornings topics at the 46th ASHP Midyear Clinical Meeting and Exhibition in New Orleans, Louisiana, in December 2011. Antimicrobial stewardship is a coordinated effort to ensure the judicious and effective use of antimicrobial therapy that includes but is not limited to the appropriate selection, dosing, route of administration, and duration of antimicrobial therapy. The Mid-year program was presented by Craig Martin, Pharm.D., BCPS-ID. Attendees submitted questions about unresolved issues and controversies that were later addressed by Dr. Martin in a live webinar conducted on March 15, 2012. Some of the highlights of the webinar pertaining to the role of antimicrobial stewardship in health systems and the use of extended (i.e., prolonged) infusions of β -lactam antibiotics were described in an **e-newsletter released earlier** (PDF). Highlights of the webinar pertaining to empiric therapy for suspected invasive candidiasis, the use of rapid diagnostic tests, ways to maximize the success of an antimicrobial stewardship program, and the role of the staff pharmacist in antimicrobial stewardship are described in this e-newsletter.

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Expand Your Knowledge



On-demand CPE Activities

If you were unable to attend the live symposium, *Antimicrobial Stewardship in Health Systems: Opportunities for the Multidisciplinary Team to Improve Patient Care*, conducted at the 2011 ASHP Midyear Clinical Meeting, a **1-hour CPE activity is available on demand.**



Faculty Podcast Interviews

Visit the CE in the Mornings **web portal** to listen to podcast interviews with the faculty. Four interviews, each lasting approximately 5 to 14 minutes, are available.

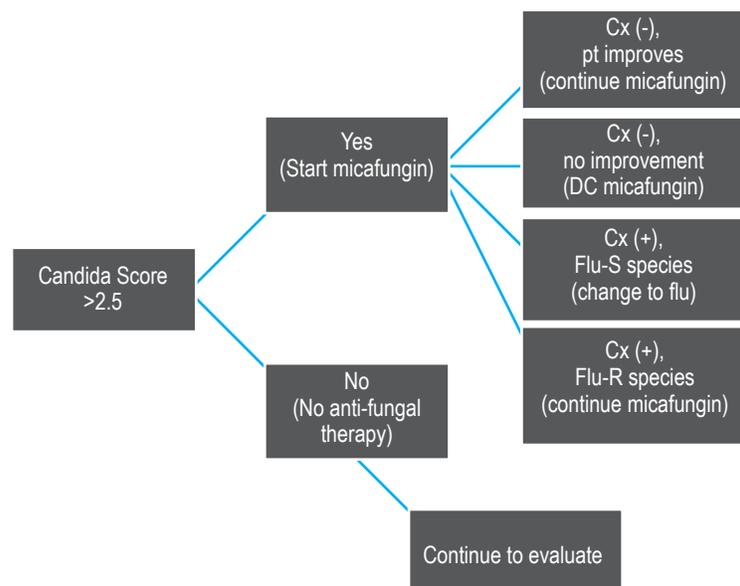
Question: What is the role of antimicrobial stewardship in managing antifungal use and invasive fungal infections?

At UK HealthCare we had experienced a dramatic increase in echinocandin use in patients in the intensive care unit (ICU), which did not necessarily reflect inappropriate use. In the United States, resistance has been increasing to fluconazole, which formerly was the gold standard of prophylaxis against the most common *Candida* species, *Candida albicans* (*C. albicans*), but the epidemiology of invasive fungal infections has changed.¹

The increase in echinocandin use at UK HealthCare occurred in the absence of an organized approach to ensure that use was appropriate. We developed guidelines for treating patients with suspected invasive candidiasis to address this problem. We used a published, simple bedside scoring system to screen for immunocompetent patients with suspected invasive candidiasis for empiric antifungal treatment (Figure 1). The scoring system is point-based, with points allocated for several patient characteristics:²

- Multifocal *Candida* colonization (1 point)
- Surgery on admission to the intensive care unit (1 point)
- Parenteral nutrition (1 point)
- Severe sepsis (2 points)

Figure 1. UK HealthCare: Suspected Invasive Candidiasis Guidelines



We used a total score of 3 or higher to identify patients for empiric therapy because analysis of a database of nonneutropenic critically-ill patients revealed that scores exceeding 2.5 were associated with a sevenfold higher risk of invasive candidiasis compared with lower scores (the score for an individual is always a whole number).² The *Candida* score accurately identifies patients who benefit from early (i.e., empiric) antifungal treatment.

At UK HealthCare, approximately 20% of our *Candida* isolates are not susceptible to fluconazole, so we use the echinocandin micafungin for patients at risk for invasive candidiasis based on their *Candida* score. The other two available echinocandins caspofungin and anidulafungin are equally effective, but micafungin is the echinocandin on our formulary. We later de-escalate therapy based on the results of culture and susceptibility tests, switching to the less costly fluconazole if an isolate susceptible to that drug is detected. The most difficult part of implementing these guidelines is convincing prescribers to discontinue micafungin in patients who have no positive cultures and in whom no obvious response is observed.

The availability of the PNA FISH test now allows us to rapidly identify *C. albicans* and switch to fluconazole earlier than when we first implemented the guidelines. Patients in whom other *Candida* species with lower susceptibility to fluconazole (especially *C. glabrata*) have been isolated continue to receive micafungin.

“**Pharmacists are a critical cog in the machinery needed to operate an antimicrobial stewardship program, performing many of the vital day-to-day functions that make such programs a success in improving antimicrobial use and patient outcomes.**”

— Craig Martin, Pharm.D., BCPS-ID

Implementation of our guidelines in late 2009 was followed by a significant reduction in echinocandin use (Figure 2). In echinocandin-treated patients, the mean number of ICU days, length of stay index (a measure of the actual length of stay relative to the expected length of stay), and mortality index (a measure of actual mortality relative to expected mortality) also decreased. These data demonstrate that improvement in patient outcomes as well as reduced echinocandin use was achieved through the implementation of guidelines for treating patients with suspected invasive candidiasis. We need to perform an analysis of ICU patients who did not receive echinocandins to ensure that outcomes were not compromised.

Question: What are your thoughts on the use of rapid diagnostic tests?

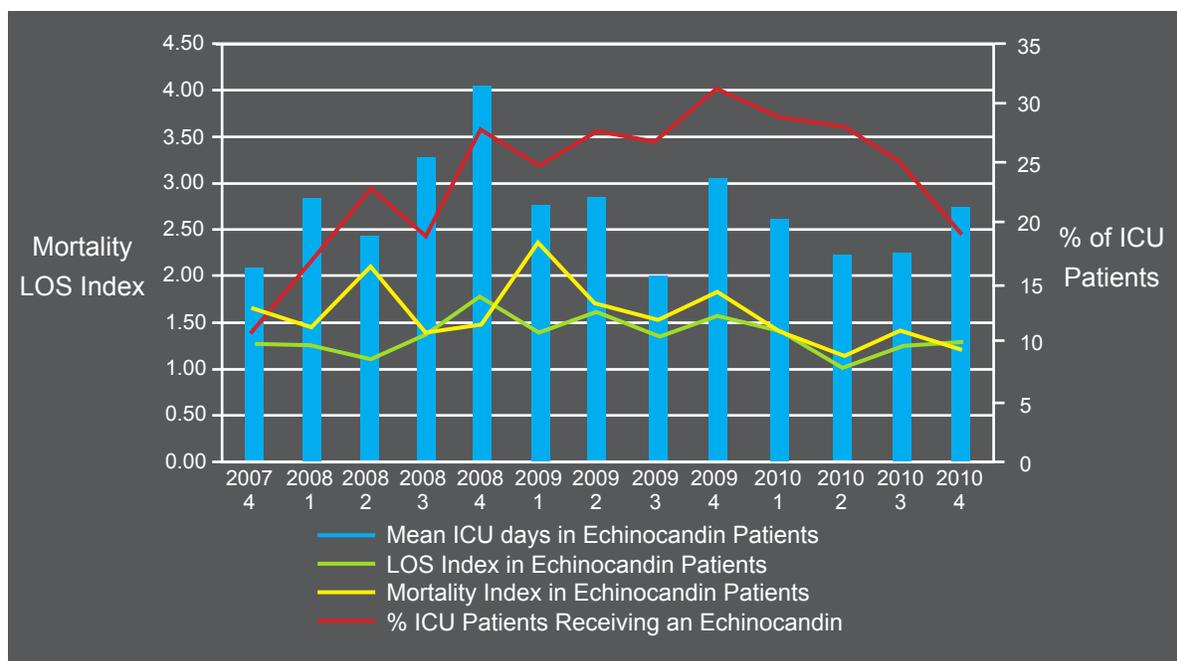
Laboratory tests that allow early differentiation between resistant and susceptible pathogens (e.g., real-time PCR testing for methicillin-resistant and susceptible *Staphylococcus aureus*) can allow the use of targeted antimicrobial drug

therapy that improves patient outcomes, minimizes resistance, and reduces length of stay and hospital costs.³ The cost savings could exceed the cost of the new test. Pharmacists should collaborate with clinical microbiologists in making decisions about the use of rapid diagnostic tests.

Question: What approach do you recommend to maximize the success of an antimicrobial stewardship program? What are the best ways to address physician resistance to the program?

It is not uncommon to encounter one or more physicians who are uncooperative with antimicrobial stewardship program requirements. In some places (e.g., California), regulatory mandates for antimicrobial stewardship programs provide the needed clout to obtain cooperation. I've found that it helps to enlist the assistance of a physician champion who is respected in the institution, persuasive in explaining the rationale for the program, and effective in motivating changes in prescribing behavior. This physician champion can be particularly valuable to a pharmacist who is new to

Figure 2.
Clinical Indicators in ICU Patients Receiving Echinocandins at UK HealthCare



Advocating Antimicrobial Stewardship as a Legislative and Regulatory Mandate

Antimicrobial stewardship was addressed in March 8, 2012, testimony by a representative from the Infectious Diseases Society of America (IDSA) to the U.S. House of Representatives Committee on Energy and Commerce Subcommittee on Health as part of the reauthorization process for the Food and Drug Administration (FDA) Prescription Drug User Fee Act, legislation known as PDUFA that authorizes FDA to collect user fees from manufacturers of human drug and biological products. The longstanding position of IDSA that all health care facilities, including hospitals, long-term care facilities, long-term-acute care facilities, ambulatory surgical centers, and dialysis centers, should be required to develop and implement an antimicrobial stewardship plan as a condition of participation in Medicare and Medicaid was reiterated in the testimony.

In a policy statement on antimicrobial stewardship released March 15, 2012, the Society for Healthcare Epidemiology of America (SHEA), IDSA, and the Pediatric Infectious Diseases Society (PIDS) stated that antimicrobial stewardship must be a fiduciary responsibility for all health care institutions across the continuum of care. The following recommendations were put forth in the policy statement:

1. Antimicrobial stewardship programs should be required through regulatory mechanisms
 2. Antimicrobial stewardship should be monitored in ambulatory health care settings
 3. Education about antimicrobial resistance and antimicrobial stewardship must be accomplished
 4. Antimicrobial use data should be collected and readily available for both inpatient and outpatient settings
 5. Research on antimicrobial stewardship is needed
- The IDSA testimony and IDSA/SHEA/PIDS policy statement promote legislative and regulatory mandates for antimicrobial stewardship.

Sources

Infectious Diseases Society of America's (IDSA) statement promoting anti-infective development and antimicrobial stewardship through the U.S. Food and Drug Administration Prescription Drug User Fee Act (PDUFA) reauthorization before the House Committee on Energy and Commerce Subcommittee on Health. March 8, 2012. Available at: <http://bit.ly/H8pDCQ> (accessed 2012 Mar 15).

Policy statement on antimicrobial stewardship by the Society for Healthcare Epidemiology of America (SHEA), the Infectious Diseases Society of America (IDSA), and the Pediatric Infectious Diseases Society (PIDS). March 15, 2012. Available at: <http://bit.ly/HLMJVP> (accessed 2012 Mar 23).

the institution and needs assistance navigating the political landscape while implementing a new antimicrobial stewardship program. Asking a reluctant physician for assistance in solving a problem with antimicrobial use can be effective in gaining cooperation by making him or her part of the solution to the problem. We share clinical outcomes data with nursing and medical staff at UK HealthCare as part of our education strategy to demonstrate the impact of the antimicrobial stewardship program and promote adherence to program requirements.

Table 1 lists other helpful tips for implementing a successful antimicrobial stewardship program. Sample policies and guidelines for empiric antimicrobial therapy used at UK HealthCare are [available online](#).

Table 1. Tips for Implementing a Successful Antimicrobial Stewardship Program

Identify a physician champion
Educate health care personnel and administrators about the program goals and potential benefits
Use palatable language and discuss the program goals in the context of potential improvements in patient safety and quality of care
Don't be too restrictive in your policies and guidelines
Focus on improving clinical outcomes
Don't be the person who raises cost concerns in every conversation
Be willing to lose a battle to gain an ally (i.e., compromise)
Engage reluctant practitioners in fixing the problem
Don't forget to address medication-use processes (storage, ordering, preparation, delivery, and administration)

Question: What is the role of the staff pharmacist in antimicrobial stewardship?

Guidelines for developing an institutional program to enhance antimicrobial stewardship from the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA) call for a clinical pharmacist with infectious diseases (ID) training to

Practice Changes

In a survey conducted approximately 8 weeks after the December 2011 CE in the Mornings program on antimicrobial stewardship, program attendees were asked what practices they had implemented or improved (or intend to implement or improve) based on the knowledge acquired by participating in the program. Many attendees had already made improvements or implemented practices to promote antimicrobial stewardship in their institutions. These practice changes included:

- Describing the potential impact of antimicrobial stewardship programs (ASPs) on the emergence and transmission of antimicrobial-resistant microorganisms in the institution,
- Identifying potential barriers to implementation of an ASP,
- Developing multidisciplinary strategies to overcome barriers to implementing an ASP, and
- Explaining legislative efforts and educational campaigns to address antimicrobial resistance.

Barriers to implementation of or improvement in practices included a lack of time, lack of personnel, lack of administrative support, and resistance from others on the health care team. Information on antimicrobial stewardship provided in the CE in the Mornings educational initiative should help overcome barriers to improving antimicrobial use in health systems.

serve as a core member of a collaborative multidisciplinary antimicrobial stewardship team.⁴ The numbers of ID residencies and fellowships and graduates of these programs are limited. Certification programs suitable for pharmacists without ID training are available from the Society of Infectious Diseases Pharmacists (www.sidp.org) and Making a Difference in Infectious Diseases Pharmacotherapy, which is commonly known as MAD-ID (www.MAD-ID.org). There is a shortage of pharmacists with specialized ID training to serve as core members of antimicrobial stewardship teams in U.S. health systems. Nevertheless, staff pharmacists without ID training can make a variety of valuable contributions to antimicrobial stewardship by:

- Educating health care personnel about the importance of antimicrobial stewardship and prudent antimicrobial use
- Identifying problem areas for improvement in antimicrobial use
- Developing guidelines for antimicrobial use in the institution
- Evaluating the benefit of novel diagnostic or laboratory techniques
- Prioritizing antimicrobial stewardship projects based on available resources and program goals
- Intervening to improve antimicrobial use in specific patients on a day-to-day basis
- Promoting the antimicrobial stewardship program to other health care personnel and health system administration
- Compiling data, preparing reports, and presenting findings related to antimicrobial use
- Conducting research to demonstrate the benefits of antimicrobial stewardship

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References

1. Pfaller MA, Messer SA, Boyken L et al. Selection of a surrogate agent (fluconazole or voriconazole) for initial susceptibility testing of posaconazole against *Candida* spp.: results from a global antifungal surveillance program. *J Clin Microbiol*. 2008; 46:551-9.
2. León C, Ruiz-Santana S, Saavedra P et al. A bedside scoring system ("Candida score") for early antifungal treatment in nonneutropenic critically ill patients with *Candida* colonization. *Crit Care Med*. 2006; 34:730-7.
3. Goff DA. Antimicrobial stewardship: bridging the gap between quality care and cost. *Curr Opin Infect Dis*. 2011; 24(suppl 1):S11-20.
4. Dellit TH, Owens RC, McGowan JE Jr et al. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. *Clin Infect Dis*. 2007; 44:159-77.

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