

Practical Checklist for Implementation of Antifungal Stewardship Programs

Antifungal Stewardship Programs (SPs) need to be implemented in health care facilities to limit overuse or misuse of antifungals, proven to be responsible for an increase in antifungal resistance.

This checklist should be used in health care facilities on a periodic basis to assess key elements and actions to ensure optimal antifungal prescribing.



To start antifungal stewardship activities

1. Define achievable objectives according to your facility and your knowledge regarding the essential items in this checklist.
2. Define outcome measures (e.g., antifungal consumption or resistance trend).
3. Share reports with prescriber's and facility leadership to involve them in the antifungal stewardship program.
4. Define an improvement road map for the next period and new objectives connected with the road map.

This checklist will assist facilities with developing essential items () and/or adapting essential items, where they are currently present.*

Areas to Establish

LEADERSHIP SUPPORT	YES	NO
*Does your facility leadership provide a formal statement that supports efforts to improve antifungal use (antifungal stewardship)?		
*Does your facility leadership ensure that antifungal stewardship activities are integrated in other boards (e.g. pharmacy and therapeutics committee, medical and safety or quality committee)?		
Does your facility receive any financial support for antifungal stewardship activities (e.g., support for salary, training)?		
Does your facility leadership provide stewardship program leader(s) with dedicated time to manage antifungal SP?		

ACCOUNTABILITY	YES	NO
*Does your facility have a leader or co-leaders to manage antifungal SP activities?		
*Is there an infectious disease physician leader responsible for stewardship activities at your facility?		
*Is there a pharmacist leader responsible for stewardship activities at your facility?		
*Is there a leader responsible for program outcome?		
*Do antifungal SP leaders have regularly scheduled meetings? If yes, at what rate of frequency: _____		
Does your facility have a formal multidisciplinary group that manages antifungal SP (e.g. antifungal sub-group)?		
Do staff from key support departments have sufficient time to contribute to stewardship activities? If yes, provide the dedicated time: _____		

KEY SUPPORT FOR THE ANTIFUNGAL STEWARDSHIP PROGRAM

Do any of the staff members, referenced below, work with the stewardship leaders to improve antifungal use?

YES

NO

	YES	NO
Pharmacists		
Clinicians - which specialties? _____		
Infectious disease		
Mycology (Laboratory)		
Administration staff		
Infection Prevention and Control		
Information Technology (IT)		
Nursing staff		
Quality improvement		
Education department		

ACTIONS TO SUPPORT OPTIMAL ANTIFUNGAL USE

Do policies need to be established?

YES

NO

	YES	NO
*Does your facility have facility-specific treatment recommendations, based on national guidelines and local susceptibilities, to assist with antifungal selection for common clinical conditions?		
Does your facility have tools implemented to help clinicians with the off-labelled use of antifungals?		
Does your facility have tools implemented to assist prescriber documentation in the medical record or during order entry with a dose, duration, and indication for all antifungal prescriptions?		

BROAD INTERVENTIONS TO IMPROVE ANTIFUNGAL USE		
Are the following actions to improve antifungal prescribing conducted in your facility?	YES	NO
*Does your facility SP have an infectious disease telephone counseling option, a bedside case management feature, or mobile team assistance for antifungals?		
*Does your facility have access to the results of both fungal culture and non-culture-based tests (e.g. biomarkers, PCR)?		
Does your facility have access to rapid yeast and mold identification tests (<24h)?		

Does a physician or pharmacist review courses of therapy for specified antifungal agents (i.e. prospective audit with feedback) at your facility? If yes, for which antifungal classes: _____		
Is there a formal procedure for all clinicians to review the appropriateness of all antifungals after the initial orders? _____		
Do specified antifungal agents need to be approved by a physician or pharmacist prior to dispensing (i.e., pre-authorization) at your facility? If yes, for which antifungals: _____		
Does your facility perform antifungal use evaluation (post prescription review) for specific antifungal agents, to identify opportunities and improve use? If yes, for which antifungals and at what frequency: _____		
Does your facility have access to rapid diagnostic testing for any fungal agent, including point of care?		
Does your facility have access to antifungal therapeutic drug monitoring? If yes, provide the time delay before results are available: _____		

Actions to Implement

PHARMACY-DRIVEN INTERVENTIONS		
Are the following actions implemented in your facility?	YES	NO
Alerts in situations where therapy might be reevaluated or discontinued?		
Changes from intravenous to oral antifungal therapy in appropriate situations?		
Dose optimization (pharmacokinetics/pharmacodynamics) in cases of organ dysfunction or drug interactions, particularly for azoles?		
A computer-assisted real-time request of all antifungal prescriptions?		

DIAGNOSIS AND INFECTIONS SPECIFIC INTERVENTIONS		
Does your facility have treatment recommendations to ensure optimal use of antifungals to treat the following common infections?	YES	NO
*Invasive candidiasis		
*Invasive aspergillosis		
Mucormycosis		
Cryptococcosis		
Candiduria		
Empirical invasive candidiasis		
Antifungal prophylaxis (primary and/or secondary)		

ACTIONS TO MONITOR ANTIFUNGAL PRESCRIBING, USE, AND RESISTANCE		
Process measures	YES	NO
*Does your stewardship program monitor tracing capabilities?		
Does your stewardship program monitor adherence to facility-specific treatment recommendations?		
Does your antifungal SP monitor preauthorization interventions?		
Does your antifungal stewardship program monitor antifungal use, including implementing prospective follow up of indication and appropriateness of therapy?		
Does your facility have a local surveillance system for major invasive fungal diseases?		

ANTIFUNGAL USE		
Outcome measures	YES	NO
*Does your facility have access to an antifungal susceptibility report?		
*Does your facility define outcome measures to follow antifungal use annually? (e.g. antifungal consumption, antifungal resistance, or patient-level outcomes such as treatment efficacy, adverse effects occurrence, or hospital length of stay)		
Does your facility produce a report on the incidence of major invasive fungal diseases?		
Does your facility monitor antifungal use (consumption) at the unit and/or facility wide level by one of the following metrics:		
*At the facility level?		
*At the unit level including intensive care unit, haematology, and pneumology?		

*By standardized antimicrobial administration ratio (SAAR)?		
By counts of antifungal(s) administered to patients per day (Days of Therapy; DOT)?		
By direct expenditure for antifungals (purchasing costs)?		

REPORTING INFORMATION TO STAFF ON IMPROVING ANTIFUNGAL USE AND RESISTANCE		
Outcome measures	YES	NO
*Does your stewardship program share facility and/or prescriber-specific reports on antifungal use?		
*Has a current antifungal susceptibility profile been distributed to prescribers at your facility? With which frequency, if so? _____		
Do prescribers ever receive direct, personalized communication about how they can improve their antifungal prescribing?		
Do antifungal SP leaders share priorities with prescribers and/or facility leadership to improve antifungal use?		

EDUCATION PROGRAM		
Outcome measures	YES	NO
*Does your stewardship program provide education to clinicians and other relevant staff including residents, on improving antifungal prescribing?		
Is there any formal education provided to clinicians and other relevant staff (e.g. professional development)?		
Does your facility support the dissemination of educational messages to clinicians and other relevant staff regarding optima antifungal use (e.g. intranet, staff memo)?		

REFERENCES

- [1] Hamdy RF, Zaoutis TE, Seo SK. Antifungal stewardship considerations for adults and pediatrics. *Virulence* 2017;8:658–72. <https://doi.org/10.1080/21505594.2016.1226721>.
- [2] Mondain V, Lieutier F, Housseine L, Gari-Toussaint M, Poiree M, Lions C, et al. A 6-year antifungal stewardship programme in a teaching hospital. *Infection* 2013;41:621–8. <https://doi.org/10.1007/s15010-013-0431-1>.
- [3] Lamoth F, Chung SJ, Damonti L, Alexander BD. Changing Epidemiology of Invasive Mold Infections in Patients Receiving Azole Prophylaxis. *Clinical Infectious Diseases* 2017;64:1619–21 <https://doi.org/10.1093/cid/cix130>.
- [4] Bienvenu AL, Argaud L, Aubrun F, Fellahi JL, Guerin C, Javouhey E, et al. A systematic review of interventions and performance measures for antifungal stewardship programmes. *J Antimicrob Chemother* 2018;73:297– 305. <https://doi.org/10.1093/jac/dkx388>.
- [5] Johnson MD, Lewis RE, Dodds Ashley ES, Ostrosky-Zeichner L, Zaoutis T, Thompson GR, et al. Core Recommendations for Antifungal Stewardship: A Statement of the Mycoses Study Group Education and Research Consortium. *The Journal of Infectious Diseases* 2020;222:S175–98. <https://doi.org/10.1093/infdis/jiaa394>.
- [6] Core Elements of Antibiotic Stewardship | Antibiotic Use | CDC 2021. <https://www.cdc.gov/antibiotic-use/core-elements/index.html> (accessed September 16, 2021).