# The role of diagnostic tests in antifungal stewardship for treating invasive fungal infections: a plain language summary

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# Summary

## What is this summary about?

This is a summary of an article originally published in the journal *Open Forum Infectious Diseases*.

Invasive fungal infections are caused by fungi. They can spread to deeper parts of the body. Some diagnostic tests are slow and may delay treatment. Better tests help to identify infection early in patients. An antifungal stewardship (shortened to AFS)

program is a stepwise process to improve how patients are treated. AFS programs using diagnostic tests may help to manage infections. In this study, researchers wanted to know the impact of such AFS programs. To do so, they looked at the information from 17 previously published studies, which is summarized here.

## What were the results?

Infections were identified and treated faster in studies with improved diagnostic tests. Treatment cost decreased when infections were identified and treated early. Patients were treated for shorter periods of time. They also spent less time in hospital. Number of deaths were less.

## What do the results of the study mean?

AFS programs based on diagnostic tests helped patients.

# Where can I find the original article on which this summary is based?

You can read the original article 'The Role of Diagnostics-Driven Antifungal Stewardship in the Management of Invasive Fungal Infections: A Systematic Literature Review' published in the journal *Open Forum Infectious Diseases* for free at: <u>https://academic.oup.com/ofid/article/9/7/ofac234/6584378</u>.

**How to say** (double click sound icon to play sound)...

- Invasive: in-VA-sive
- Antifungal: an-TI-fun-GAL
- β-**D-glucan:** beta-D-GLU-can
- Diagnostic: DI-ag-NOS-tic
- Stewardship: STEW-ard-SHIP



# Who is this article for?

- Doctors, nurses and other healthcare professionals treating fungal infections may want to read this article.
- Patients, caregivers, and patient support groups may find this article useful.



Healthcare professionals such as doctors and nurses



Patient support groups

# What are invasive fungal infections?

- Fungi are present in the environment and can live in soil, water, and air, and on plants, surfaces, skin, and other parts of the body. There are many species of fungi but only some are known to cause illness.
- Fungi are usually harmless in healthy individuals. But some drugs and illnesses result in poor health in patients and increase the chance of a fungal infection.
- Invasive fungal infections (shortened to IFIs) usually affect patients with weak immunity (ability to fight germs and illness).
- IFIs are serious fungal infections. They may spread through blood vessels and tissues to different parts of the body.
- It is difficult and costly to treat IFIs. Many patients die from IFIs each year.





# What are AFS programs and what is the role of diagnostics?

- Diagnostic tests are medical tests that help to detect the illness or fungal species causing the illness.
- Common tests used to identify fungal infections can be slow and may delay the right treatment.
- When the right treatment is delayed or not given, patients may not recover from fungal infection.
- If the cause of infection is not confirmed, patients are often treated with the wrong drugs.
- Patients may be given other drugs and experience side effects if infections are not identified early.
- If drugs are used for a long time, they may stop working against fungal infections.
- AFS programs using better tests to identify infections may help in early and better treatment. This can help to improve overall patient health.

# How was this study carried out?

We found 17 studies on AFS programs with different diagnostics tests. We carried out this study in two steps.



#### Step 1: Scientific information search from published studies

We searched for publicly available studies published from January 2010 to January 2021 that had:

- Diagnostic tests used in the AFS program.
- Patients with IFI or with a high chance of getting an infection.
- Two or more results related to treatment.

## Step 2: Results analyzed from selected studies

We went through the studies to look at the impact on:

- How long it took to give the right treatment to patients.
- Number of medicines used.
- Number of days of treatment.
- Cost of treatment.
- · How long patients stayed in hospital.
- Number of deaths.

## Who took part in the study?

#### **People included**

 People with IFIs or with a high chance of getting an infection (in AFS studies).

## What countries were they from?

• Studies were from the United States of America (USA), Europe and Asia.

#### What were the overall results of the study?

• The study included information covering 10 years.

## **Step 1: Scientific information search**

- 17 AFS studies met the criteria.
- Most studies (12) were from the USA and Europe. Few studies (5) were from Asia.



## **Step 2: Summary of results**

- Studies used different diagnostic tests.
- Some diagnostic tests were slow.
- Improved tests were faster. They helped to guide early treatment decisions.
- Tests measuring  $\beta$ -D-glucan (part of the fungal cell surface) were commonly used.
- Other diagnostic tests used were fungal growth cultures, scans, specific laboratory tests, and non-culture-based tests.
- We identified some key benefits of AFS studies with diagnostic tests:
  - Fungi were identified faster with better tests
  - Early start of the right treatment
  - Days of treatment before the cause of infection was confirmed decreased
  - Use of the wrong drugs stopped
  - Less overall use of drugs
  - Less treatment cost
  - Shorter hospital stays
  - Less number of deaths



Based on AFS guidance, doctors and



Better diagnostic test (fungi identified early)

fungi)



The right treatment started early with specific drugs



Using the right treatment early may result in:

- less use of unnecessary drugs
- shorter hospital stav
- lower treatment costs
- less deaths



continues with

many drugs

specific drugs

- longer hospital stay
- higher costs
- possible death

## What do the results of this study mean?

- AFS programs:
  - Help to make sure that the right treatment is given to improve patient health.
  - Using better diagnostic tests can help treat infections early.
  - May help improve patient care and decrease cost. However, there are few AFS studies in developing countries.
    More studies from such countries may show how AFS programs could help to improve patient health.
- Better diagnostic tests can help doctors and nurses treat patients with suitable drugs.
- More AFS studies may help to explore all the benefits of better diagnostic tests.

# Where can readers find more information on this study?

#### Details of the original study

This plain language summary is based on the original article called 'The role of diagnostics-driven antifungal stewardship in the management of invasive fungal infections: a systematic literature review' published in the journal *Open Forum Infectious Disease.* 

## **Original publication citation**

Chakrabarti A, Mohamed N, Capparella MR, Townsend A, Sung AH, Yura R, Munoz P. The role of diagnostics-driven antifungal stewardship in the management of invasive fungal infections: a systematic literature review. *Open Forum Infect. Dis.* 2022; ofac234.

You can read the full article here: https://academic.oup.com/ofid/article/9/7/ofac234/6584378

Your doctor can download a copy of the article by clicking on the link above.

# Who sponsored this study?

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