

GAFFI POLICY BRIEF



Access to Fungal Disease diagnosis in country health systems needed to combat fatalities

Overview

Many fungal diseases are impossible to diagnose without specific tests. Without timely diagnosis, patient outcomes are poor. Provision of mycology laboratory services should parallel those provided for bacteriology, including tuberculosis diagnostics.

Unfortunately, the slow growth and low yield of fungi in routine culture (growth in the lab) is a handicap for life-threatening infections. Recent technology has provided sensitive non-culture diagnostics – point of care tests or POCTs – for many life-threatening fungal diseases allowing a diagnosis to be made in less than 6 hours.

Action Needed

This policy paper outlines a health systems' approach to optimise patient outcomes, to minimise wasted expenditure, including unnecessary antifungal and antibacterial therapy (which contributes to increased antimicrobial resistance), and to provide key surveillance data. It follows GAFFI's publications on this topic.^{1,2,3}

Principles to guide diagnostic test planning in any health system, include:

- Incorporation of the diagnostic tests listed in the WHO Essential Diagnostics List (EDL), at a minimum.
- Positioning rapid tests for serious life-threatening infections as close as possible to a patient's bedside or clinic, to allow rapid turnaround times.
- Limiting unnecessary empirical antimicrobial therapy⁴, through prioritising education of clinicians on the use of Fungal Disease diagnostic testing.
- Training technical staff in laboratories and clinics and regularly update them with new developments and key research findings.
- Maintaining laboratory proficiency and accreditation systems.

In the table below, key Fungal Disease tests are grouped in categories according to simplicity and clinical requirement for rapid results, from left (most simple and point of care) to right (more complex, requiring additional expertise). Tests which appear twice, such as *Aspergillus* or *Histoplasma* antigen, can be done with different techniques.

¹ Cole DC, Govender NP, Chakrabarti A, Sacarlal J, Denning DW. Improvement of fungal disease identification and management: combined health systems and public health approaches. *Lancet Infect Dis.* 2017;17(12):e412-e419.

² Rodriguez Tudela JL, Denning DW. Recovery from serious fungal diseases should be realizable for everyone. *Lancet Infect Dis* 2017;17:1111-3.

³ Global Action Fund for Fungal Infections. "Developing a coalition roadmap for integration of fungal disease pathways and AMR solutions into health systems in Latin America". Meeting Lima, Peru September 2019; Report February 2020. <https://www.gaffi.org/global-fungal-infection-forum-4-in-lima/>

⁴ Denning DW, Perlin DS, Muldoon EG, Colombo AL, Chakrabarti A, Richardson MD, Sorrell TC. Delivering on the antimicrobial resistance agenda not possible without improving fungal diagnostic capabilities. *Emerg Infect Dis* 2017;23:177-183.

Rapid antigen tests that can be performed at the bedside	Key tests that require a laboratory	Antibody tests for subacute or chronic fungal diseases	Tests for superficial fungal diseases
<i>Aspergillus</i> *	<i>Aspergillus</i> antigen*	<i>Aspergillus</i> IgG*	Direct microscopy of skin, hair and nail samples*
Cryptococcal*	Blood culture*	<i>Aspergillus</i> IgE	Direct microscopy of vaginal samples*
	Beta D glucan	<i>Coccidioides</i> Ab	
	<i>Pneumocystis</i> PCR*	<i>Histoplasma</i> Ab	
<i>Histoplasma</i> *	<i>Histoplasma</i> antigen*	<i>Paracoccidioides</i> Ab	
	Direct microscopy of respiratory or deep tissue samples*	<i>Sporothrix</i> Ab	
	Fungal culture and identification*		
	Susceptibility testing		
	Histopathology*		
	<i>Talaromyces</i> antigen		
	Therapeutic drug monitoring		

* WHO listed Essential Diagnostics

GAFFI's recommendations for country's health systems are:

- Fungal diagnostic testing for life-threatening infections should be an integral component of microbiology laboratories, as close to the patient as possible in order to ensure rapid results:
 - Available POCTs should be used where speedy laboratory-based results cannot be guaranteed because of distance or capability
 - The full portfolio of fungal diagnostic tests should be available in at least one laboratory in each country, or a mechanism for sharing capability across country borders must be assured
- Liaison between laboratories and clinicians is a critical component of high quality care of patients, so larger mycology laboratories should directly support clinical expertise amongst their their laboratory staff
- Proficiency testing and external quality systems should be utilised as a component of laboratory accreditation
- Programs for training in mycology, diagnostic research and national reporting of results (including peer-reviewed publication) should be put in place.

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