

**Plain word title:**

Using a blood test to guide treatment for serious fungal infections in intensive care unit patients

**Scientific Title**

(1 → 3)-β-d-Glucan-guided antifungal therapy in adults with sepsis: the CandiSep randomized clinical trial

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<https://doi.org/10.1007/S00134-022-06733-X> (open access)

**Glossary:**

- *Acute myeloid leukaemia* – a cancer of the blood and bone marrow
- *Antifungal drug* – medication used to prevent or treat serious fungal infections
- *Beta-D-glucan (BDG)* – a substance that can be detected in the blood in patients with serious fungal infections
- *False positive* – a positive test result when it should be negative
- *Invasive candidiasis* – when the fungus called *Candida* (which can cause thrush) gets into the blood stream or organs and causes a serious infection. This can usually only happen in people who are very unwell.
- *Invasive fungal infection* – a general term for life-threatening fungal infections, which includes invasive candidiasis
- *Sepsis* – a life-threatening immune response to infection

**Summary of trial and results:**

In this study the researchers looked into if a blood test could be used to guide antifungal therapy in intensive care unit (ICU) patients who develop sepsis (a life-threatening immune response to infection). The blood test is taken to look for the presence of a substance called beta-D-glucan (BDG).

The study included patients who were in ICU who developed sepsis and had risk of getting a fungal infection known as invasive candidiasis. Risks for candidiasis included patients with major abdominal surgery, total parenteral nutrition (giving food

straight into the blood), recent broad-spectrum (very strong) antibiotics, and dialysis. Patients who had a suppressed immune system were excluded from the study.

342 patients took part in the study, half of the patients were randomised to the control group and half to the intervention group with BDG blood test.

The control group patients received antifungal therapy, which is standard of care. The BDG group received targeted antifungal therapy in addition to blood tests for BDG if the patient developed sepsis, if the test was positive the patient was given treatment for invasive candidiasis.

49% of patients in the BDG group were given antifungal treatment, but in the control group this was 6%.

The number of people who died was the same in both groups (30%). In the BDG group there was a very large increase in the use of antifungal drugs without any improvement in patient survival.

By going through all the available results, researchers found about 14% of the patients in the trial actually had a serious fungal infection.

#### **Comment relating to the BioDriveAFS trial:**

Two-thirds of the patients had recent intra-abdominal surgery. Another recent paper (White *et al.*, 2021) found that half of these post-operative major abdominal surgery patients get a raised BDG without having an invasive fungal infection. BDG shouldn't be used as the only test for invasive fungal infection in patients that high chance of having a positive result for another reason. If you test for BDG to look for infections in patients who had recent abdominal surgery you may get a positive result from the abdominal surgery, not because of an infection. This is a 'false positive' result and people may get all the problems and side effects from the antibiotics without any benefit.

This study excluded immunosuppressed patients where all patients in the BioDriveAFS study have a suppressed immune system, therefore this is not directly applicable to BioDriveAFS patients.

In addition, this study tested for BDG at the point the patient developed symptoms of sepsis, whereas the BioDriveAFS study monitors BDG continuously and if positive, do further investigations before the patient develops clinical features of infection.

This study achieved a low turnaround time for the BDG tests of under 24 hours, it is encouraging for the BioDriveAFS study that this is possible.

#### **Other References**

White, P. L., Posso, R., Parr, C., Price, J. S., Finkelman, M., & Barnes, R. A. (2021). The Presence of (1→3)-β-D-Glucan as Prognostic Marker in Patients After Major Abdominal Surgery. *Clinical Infectious Diseases*, 73(7), e1415–e1422. Link to article (not open access): <https://doi.org/10.1093/cid/ciaa1370>