



# The Brazilian Journal of INFECTIOUS DISEASES

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## Letter to the Editor

### No blood culture examinations during off-hours?



Dear Editor,

Blood stream infection is a severe condition that requires urgent treatment. Blood culture examination is a classic, gold-standard test to detect the causative organism, and early test results facilitate the administration of appropriate antibiotic therapy. In this letter, I would like to seek universal opinions regarding timely management of blood culture examinations in clinical laboratories.

Usually, a positive signal can be obtained within 24 h after starting incubation. However, using classical methods, an additional day or two is required for bacterial identification. To overcome this delay, various methods for rapid bacterial identification have been proposed. Representative methods include peptide nucleic acid fluorescent *in situ* hybridization (PNA-FISH) tests such as QuickFISH (AdvanDx; Woburn, MA, USA), matrix-assisted laser desorption-ionization/time-of-flight (MALDI-TOF) mass spectroscopy, polymerase chain reaction (PCR)-based detection systems such as GeneXpert (Cepheid; Sunnyvale, CA, USA), and multiplex PCR such as the Verigene system (Nanosphere; Northbrook, IL, USA) and the Biofire FilmArray system (bioMerieux; Marcy l'Etoile, France).<sup>1</sup> As well as bacterial identification, MALDI-TOF mass spectroscopy can detect strains carrying resistant genes such as those coding for carbapenemases,<sup>2</sup> contributing to the proper choice of antibiotics right from the beginning. These rapid pathogen identification systems have been proven to be cost-effective and associated with better clinical outcomes.<sup>1</sup> In this way, testing techniques at clinical laboratories have dramatically improved.

On the other hand, I feel that the importance of the proper management or handling of blood culture samples is considerably less recognized. If blood cultures are not submitted to clinical laboratories, the steps necessary to implement rapid bacterial identification systems are not initiated. At Okayama University Hospital, the clinical laboratory does not receive blood culture bottles during off-hours such as during the night and holidays. The incubation of blood samples begins on the following morning for samples collected overnight, and at the beginning of the week for samples collected on weekends. For example, an incubation of blood samples obtained on Saturday is started on Monday, resulting in about a two-day delay before results are obtained. Delayed inoculations

correspond to longer periods until results are reported. Thus, diagnosis of severe infections is often protracted at our facility. Furthermore, the positive detection rate may decrease if the incubation of culture bottles is delayed by more than 24 h.<sup>3</sup> In fact, guidelines strongly recommend that blood culture samples be promptly incubated.<sup>4,5</sup>

With a sense of urgency, I have advised the Department of Clinical Laboratory and the Department of Infectious Diseases to reconsider the current examination system. However, my suggestions have unfortunately been rejected. Okayama University Hospital is a tertiary medical facility with more than 800 admission beds including two intensive care units and an advanced emergency medical service center. More than 10,000 operations per year are performed at the hospital, including organ transplantations. Many inpatients receive anticancer agents or immunosuppressive therapy. Thus, many patients are immunocompromised and vulnerable to infections. For such a patient population, delays in diagnosis can lead to poor prognosis. I argue that the present system for blood culture examination, *i.e.*, the unwillingness to process blood culture bottles during off-hours, is unacceptable. If the number of clinical laboratory technicians is insufficient, hospital administrators should increase hiring accordingly. Clinicians should demand that blood culture samples are promptly incubated, even during off-hours, to improve patient prognosis. How are blood culture examinations handled at other clinical hospitals?

The importance of rapid diagnosis is becoming increasingly emphasized in this modern world of highly advanced medical technology, particularly in the field of infectious diseases. I hope our medical facility will respond to such demands and expectations. To improve the quality of blood culture examinations, a well-established transportation system within the hospital is essential. Without transportation, culture bottles are left in the wards in which they were collected. In addition, education of medical staffs concerning the importance of the appropriate handling of blood cultures is also warranted.

In conclusion, clinical laboratories should organize an examination system for blood cultures even during off-hours. Rapid bacterial identification leads to early treatment, appropriate use of antibiotics and better patient prognosis.

