

Management Bundle for Prevention of Blood Stream Infection : 2017



**Working Group for Management Bundle
for Prevention of Blood Stream Infection : 2017
Tokai Blood Stream Infection Network**

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Blood Collection

- Blood cultures are drawn within 1 hour (or within 2 hours, if difficult) from onset of fever or chills.
- Appropriate blood culture bottles are selected in accordance with specific purposes.
(e.g., usually using aerobic and anaerobic bottles. using pediatric bottle, if small blood volume collected such as pediatric patients. using mycobacterium bottle, if suspected mycobacteremia.)
- Blood cultures are drawn before the start or change of antimicrobial therapy.
- Blood cultures are drawn in multiple sets on the same day.
- When endocarditis is suspected, blood cultures are drawn 3 or more sets of before starting antimicrobial therapy.
- An appropriate blood volume (more than 80 % of the maximum collectable blood volume per bottle) is drawn.
- Appropriate disinfectants are used for skin disinfection at the blood collection (following the method described in the Guidance for Blood Culture Testing provided by the Japanese Society for Clinical Microbiology).
- Gloves are worn at the blood collection.
- Confirmed the usage of indwelling medical devices such as intravascular catheters.
- If catheter-related bloodstream infection is suspected, one of blood culture set drawn from peripheral vein and another blood culture set drawn from through the catheter.
- Blood culture bottles are transporting to the laboratory within 2 hours of blood collection.

Laboratory

- Blood culture starts to incubate within 2 hours of blood collection.
- Gram staining is performed when blood cultures turn positive.
- The types of bacteria are assumed from gram stains (morphology of bacteria).
- The media for subculture are selected based on the results of gram staining.

Medication

- Pathogens are assumed when blood cultures are drawn.
- The following treatments/actions are performed when blood cultures turn positive:
Examples of treatment: Start empirical antimicrobial therapy against assumed pathogens, or withhold antimicrobial therapy in case of contamination.
Examples of action: Removal of intravascular catheter if short-term catheter related bloodstream infection is suspected.
- Required actions (such as de-escalation to narrow spectrum antibiotics) are performed when the pathogens are identified and the result of drug susceptibility test was revealed.
- The focus of infection is identified or any causal inquiry for such identification (e.g., echocardiography in case of *S. aureus* bacteremia) is performed.
- Antibiotics dosage regimen (including medication doses and methods) is appropriately implemented.
- Therapeutic Drug Monitoring (TDM) of antibiotics should be performed, it is examined in an appropriate timing and the results are utilized to the dosage regimen.
- For *S. aureus* and fungal infection, repeated blood cultures for detecting negative conversion is confirmed.
- Confirmed that each patient is informed of the result of blood culture.
- Clinical responses including vital signs are evaluated.
(e.g.,: On the 7th to 14th day from the completion of clinical treatment, the effect of treatment is interpreted as "success", "failure" or "uninterpretable" .)
- Patient prognosis is assessed.
(e.g., On the 28th day from the startup of clinical treatment, patients are interpreted as "alive", "dead within a week", "dead by the end of the 2nd week" and "dead by the end of the 4th week" .)

Pediatric: special consideration requested

- The immunodeficiency and vaccination history (especially the vaccination of pneumococcus and Hib (*H. influenzae* type b)) of each pediatric patient is confirmed before drawing blood cultures.
- Blood cultures are examined for febrile babies of less than 3 months old.
- Blood cultures are examined for pediatric patients who present shock.
- Except newborns, 1mL or more amount of blood is drawn per bottle.
- The blood volume does not exceed the upper limit of a culture bottle (4mL in case of PF Plus bottle and 3mL in case of BD BACTEC™ Peds Plus™ /F bottle).
- For pediatric patients, blood cultures are basically drawn in 2 or more sets.
- When infectious diseases caused by anaerobic bacteria (such as head and neck infections and intraperitoneal infections) is suspected, anaerobic bottles for adults are added in parallel.

Blood collection	items/11 items	Compliance rate	%
Laboratory	items/ 4 items	Compliance rate	%
Medication	items/10 items	Compliance rate	%
Pediatric	items/ 7 items	Compliance rate	%
Total (for Process)	items/32 items	Average compliance rate	%

Structure

Laboratory

- Blood culture testing is performed at our own facility.
- Blood culture testing is performed 365 days a year.
- Blood culture testing is performed 24 hours a day.
- When blood cultures turn positive, bottles are processed within an hour.
- A manual for interim reporting of blood cultures is prepared.
- A system that can shorten to report the results of positive blood cultures, for example, reporting the results of genetic analyses, mass spectrometry, diagnosis using rapid detection kits, etc. is available.
- A system that confirms the receipt of the final report of positive blood cultures is available.
- Blood culture bottles for pediatric patients are available.

ICT (Infection Control Team)

- Lectures/seminars for blood culture testing are held.
- A manual of drawing blood for blood culture examination is available.
- The blood volume to be collected from pediatric patients is described in the manual.
- Also for pediatric patients, it is recommended to collect the blood culture in 2 sets.
- The methodological appropriateness of blood culture testing is assessed.
- Blood culture positive rate is calculated.
(Calculation formula: Number of positive sets / Total number of sets)
- The number of blood culture sets per 1,000 patient-days is calculated.
(Calculation formula: Total number of blood culture sets per year / Total number of hospitalized patients x 1,000)
- Blood culture contamination rate is assessed.
(Calculation formula: Number of contaminated blood culture sets / Total number of blood culture sets x 100%)
- The collecting rate of multiple blood culture sets is evaluated.
(Calculation formula: Rate of solitary blood culture (SBC) sets = Total number of SBC* sets / Total number of blood culture sets x 100%)
(Calculation formula: Rate of multiple blood culture sets collecting = [Total number of blood culture sets – Total number of SBC sets] / Total number of blood culture sets x 100%)
* (SBC) means solitary blood culture sets within 24 hours
- Feedback is provided with respect to the results of blood culture surveillance.

Laboratory	items/ 8 items	Compliance rate	%
ICT	items/10 items	Compliance rate	%
Total for Structure	items/18 items	Average compliance rate	%