Blood Culture Collection Clinical Guideline V11.0

Document reference code: IC/039/24

This is a joint guideline between Cornwall Partnership NHS Foundation Trust and Royal Cornwall Hospitals NHS Trust.

Purpose: Guidance for the safe and aseptic collection of blood for blood culture investigations.

Target audience: RCHT and CFT staff.

Document author and role: Graham Kaye, Senior IPAC Specialist Practitioner.

Document author contact details: 01872 254969.

Document definition: Guidelines

Supporting committee and chairperson: RCHT and CFT IPAC Committee.

Executive director responsible for the clinical guideline: Chief Nursing Officer.

Freedom of information: Can be released under the Freedom of Information Act 2000

CFT Document section: Health and safety, infection control.

Audience:

☒ Cornwall Partnership NHS Foundation Trust

☒ Royal Cornwall Hospitals NHS Trust

Key words: Blood culture, blood collection, laboratory practice, laboratory biological methods, communicable disease control, infection control, health protection, laboratory practice, body fluids, blood, biomedical cultures, infection, disease.

Approval process

Approved at: RCHT and CFT IPAC Committees.

Date approved: 29 May 2024.

Executive approval: Louise Dickinson, Director of Infection Prevention and Control (DIPC).

Date approved by: 29 May 2024

RCHT General manager confirming approval processes: Joanne Taylor, Deputy DIPC.

RCHT Governance lead confirming approval process: Joanne Taylor, Deputy DIPC.

Review date: 1 January 2027.

Expiry date: 1 July 2027.

Publication location:

☒ Internet and intranet ☐ Intranet only

RCHT Document Library folder and sub-folder: Clinical / Infection Prevention and Control.

Version control

Version	Date	Author and/or reviewer	Section	Changes (key points)
V3.0	01/05/2008	Vanessa Perks, Senior Biomedical Scientist (BMS).		Addition of blood culture adaptor collection details.
V4.0	01/02/2010	Vanessa Perks, Senior BMS.		Change to method of skin preparation.
V5.0		Vanessa Perks, Senior BMS.		Unable to locate archived version.
V6.0	01/02/2011	Vanessa Perks, Senior BMS.		Amendment to EROS code for blood culture adaptor. Change to 70% Isopropyl alcohol from 2% chlorohexidine for skin preparation.
V7.0	20/08/2013	Vanessa Perks, Senior BMS.		Update from FAN bottle to FAN plus and Paediatric FAN to Paediatric FAN plus.
V8.0	01/06/2016	Vanessa Perks, Senior BMS.		Update to BD BACTEC blood culture bottles and single use adaptor for collection.

Version	Date	Author and/or reviewer	Section	Changes (key points)
V9.0	01/09/2018	Vanessa Perks, Senior BMS. Louise Dickinson, Associate Chief Nurse/DIPC	All	Change to Unit4 codes. Details required to be recorded on the request form. Reformatted to Trust template. Summary added.
V10.0	01/06/2021	Joanne Taylor, Deputy DIPC. Vanessa Perks Senior BMS.	All	Full Review. Change Chloraprep SEPP to Chloraprep due to discontinuation of SEPP. Change to Unit4 codes. Change sanicloth 70 to green Clinell wipe. Changed to integrated template.
V11.0	01/05/2024	Graham Kaye, Senior IPAC Specialist Practitioner. Vanessa Perks Senior BMS. Suzanne Barber, Sepsis Lead. Kim Clotworthy Lead Clinical Facilitator CFT	All	Update to BACTEC manufacturer. Update to reflect guidance on when to take specimens and number of specimens to be taken. Update to related documents. Joint policy for RCHT and CFT Amended to reflect CFT practices. Reformatted to current joint template.

This document replaces: Blood Culture Collection Clinical Guideline V10.0

Summary

Only take blood for culture when there is clinical need to do so.
Blood culture should be taken before antibiotics.
Do not use existing peripheral lines to take blood culture.

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Collect and prepare equipment using standard Aseptic Non Touch Technique (ANTT).
Blood Collection Support Product holder (KFK037) and Safety Winged device with integrated extension set, these **must** be used in conjunction with:

Blood culture bottles:

- Adults - BD BACTEC Plus Aerobic and BD BACTEC Lytic/10 Anaerobic.
- Paediatrics - BD BACTEC Peds Plus.

BacT/Alert bottles are colour coded. Plastic flip tops and bottle labels are:

- Grey/Blue for BD BACTEC Plus Aerobic bottles.
- Purple for BD BACTEC Lytic/10 Anaerobic bottles.
- Pink/Silver for BD BACTEC Peds Plus Paediatric bottles.

Check the expiry date of each bottle before use and do not use if out of date or damaged. Inspect the broth for each bottle. Ensure that broth is clear – note beads are present in the Plus Aerobic and Peds Plus bottles. Do not use bottles if the broth is cloudy.

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Raise request on Maxims ensuring antibiotic and known risk factors are stated (RCHT only)
CFT request on ICE or complete a microbiology form.

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Collect blood using standard ANTT.

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8 – 10ml to be added to Plus Aerobic (Blue).

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8 – 10ml to be added to Lytic/10 Anaerobic bottle (purple).

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For BD BACTEC Peds Plus Paediatric add max 5ml (minimum 0.5ml).

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Write name, NHS number, Hospital ID, date and time collected on each bottle.

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Do not cover bar code or remove.
Record name of person collecting the specimen, date and time on the request form.

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Send blood cultures to the Laboratory as soon as possible via the pneumatic tube system or Portering staff. Alternatively in ED use the BCTEC FX instrument (RCHT) or via couriers or blood bikes (CFT).

Contents

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Data Protection Act 2018 and UK General Data Protection Regulations 2016/679 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the Data Protection Act 2018 and UK General Data Protection Regulations 2016/679, contact the Information Governance team.

- Cornwall Partnership NHS Foundation Trust: Email cpn-tr.infogov@nhs.net
- Royal Cornwall Hospitals NHS Trust: Email rch-tr.infogov@nhs.net

1. Aim/Purpose of this Guideline

1.1. The purpose of this guideline is to promote the correct procedure for blood culture collection to reduce sharps injury and contamination of samples during the collection procedure in accordance with the Saving Lives program (October 2007).

1.2. This version supersedes any previous versions of this document.

2. The Guidance

2.1. Recommendations

2.1.1. Only take blood for culture when there is a clinical need to do so and not as routine.

2.1.2. Blood cultures should be taken after clinical identification of possible bacteraemia or sepsis and before the administration of antibiotics. If a patient is on antibiotics consideration should be given as to whether it is safe to stop prior to sampling. If the patient is spiking a temperature, then samples should be taken as soon as possible. Investigating for endocarditis may allow for the cessation of antibiotics before a sample is taken.

2.1.3. If blood is being collected for other tests always collect the blood culture sample first.

2.1.4. Do not use existing peripheral lines/cannulae to obtain blood cultures.

2.1.5. If a central line is present, blood should be taken from this and from a peripheral site when investigating potential infection related to the central line. The peripheral vein sample should be collected first. (Always disinfect all access ports with 2% chlorohexidine in 70% alcohol wipe for 15 seconds and allow to fully air dry).

2.2. Required equipment

2.2.1. Procedure Tray with a sharps box (Decontaminated and cleaned (Clinell universal wipe) immediately prior to procedure if visibly clean).

2.2.2. Disposable single use Tourniquet.

2.2.3. Sterile drape (contained in a dressing pack).

2.2.4. Sterile gauze or dental roll.

2.2.5. 1 x impregnated wipes soaked with 2% chlorohexidine in 70% isopropyl alcohol. e.g. individual sanicloth CHG 2% (for cleaning blood bottle tops) and 1 x Chloraprep device for skin cleaning.

2.2.6. 1 pair of clean non-sterile gloves and plastic apron.

2.2.7. Blood Collection Support Product holder (KFK037), leur adapter and BD safety-Lok blood collection set or a Safety Winged device with integrated extension set.

2.2.8. **Blood culture bottles:**

- Adults - BD BACTEC Plus Aerobic and BD BACTEC Lytic/10 Anaerobic.
- Paediatrics - BD BACTEC Peds Plus.

BACTEC bottles are colour coded. Plastic flip tops and bottle labels are:

- Blue/Grey for BD BACTEC Plus Aerobic bottles.
- Purple for BD BACTEC Lytic/10 Anaerobic bottles.
- Pink/ Silver for BD BACTEC Peds Plus Paediatric bottles.

Check the expiry date of each bottle before use and do not use if out of date, or if damaged inspect the broth for each bottle. Ensure that broth is clear – note beads are present in the Plus Aerobic and Peds Plus bottles. Do not use bottles if the broth is cloudy.

2.3. Guide to Blood Collection

2.3.1. Raise a request using the electronic requesting system (Maxims at RCHT / microbiology form or ICE at CFT) ensuring that any antibiotic therapy is stated, and any known risk factors detailed.

2.3.2. Clean hands with alcohol hand rub or with soap and water.

2.3.3. With clean hands clean tray creating a General Aseptic Field. Gather equipment around the tray.

2.3.4. Clean hands with alcohol hand rub or with soap and water.

2.3.5. Prepare the blood collection set using standard ANTT.

2.3.6. Apply disposable apron. Disinfect hands. Identify the patient and obtain consent. Clean any visibly soiled skin on the patient with soap and water then dry.

2.3.7. Remove the centre plastic flip top from the caps of the BD BACTEC bottles immediately before collecting the sample. Disinfect the exposed rubber cap of both bottles with a new 2% chlorohexidine in 70% isopropyl alcohol wipe for each bottle for 15 seconds and allow to air dry.

2.3.8. Position the patient's arm on the sterile drape. Apply the disposable tourniquet (maximum for 1 minute only), assess the patient and identify a site for venepuncture. Loosen tourniquet. Wash hands with alcohol hand rub or soap and water.

2.3.9. Reapply tourniquet. Apply clean gloves.

2.3.10. Clean the chosen site with 2% chlorohexidine in 70% isopropyl alcohol (Chloraprep). Clean the site using a cross hatch method for 30 seconds to an area of three or four inches; the skin needs to remain 'wet' for at least 30

seconds for the alcohol to have a significant effect and allowed to fully air dry.

Connect a leur connector to the Support Product holder, then connect Safety- lok blood collection set, or connect/use the Winged device with integrated extension set. Insert needle into the cleaned area using ANTT. Do not touch the prepared venepuncture site with your fingers. If it is necessary to re-palpate, post skin cleaning then the procedure needs to be stopped and torniquet released, skin cleaning replied (as above) and torniquet then replaced . Blood must be drawn in an upright fashion keeping the blood culture bottles maintained upright if using the winged device. First inoculate 8-10mls of blood into the Plus Aerobic bottle (Blue). Then add 8-10mls of blood to the Lytic/10 Anaerobic (purple) bottle.

For the BD BACTEC Peds Plus Paediatric bottle inoculate up to a maximum of 5mls (minimum fill volume is 0.5 ml). Further blood vacutainer samples may then be taken using the same adaptor/winged device and taking in the correct order of draw. Bottles must remain in an upright position throughout the procedure.

Note: Monitor the direct draw process closely at all times during collection to assure proper flow is obtained and to avoid flow of the bottle contents into the adapter tubing. Due to the presence of chemical additives in the culture bottle, it is important to prevent possible backflow and subsequent adverse reactions. This can be achieved by holding the culture bottle at a position below the patient's arm with the bottle in an upright position. To prevent over inoculation, monitor the blood volume intake into the culture bottle, using the 5ml incremental markings on the bottle label.

Adult blood culture bottles with less than 8mls fill volume may result in a false negative result or a delayed in a positive isolate being detected. Overfill (>10mls) can lead to a false positive result.

2.3.11. On completion, remove torniquet (max application 1 minute) remove blood culture collection set/winged device, activate the safety device, and apply pressure to puncture site with sterile gauze/dental roll. Dispose of the blood collection set in accordance with departmental guidelines ensuring all sharps are placed in the sharps box. Decontaminate equipment as per ANTT Policy and disinfect hands.

2.3.12. Document patient's name, NHS number, Hospital I.D., the date and time of collection on each bottle and in the patient's notes. In addition record the name of the person collecting the specimen, date and time of collection on the request form. **When using patient registration labels do not cover the bar code on the bottle.**

Do not mark or remove the barcode section of the bottle.

2.3.13. 2 sets of blood culture bottles (2x2 bottles, 40mL) are recommended to detect bacteriaemia. These can be collected in one draw.

2.3.14. If endocarditis is suspected, 3 sets of blood culture bottles (3x2 bottles, 60mL) should be collected as separate draws over a 24h period.

2.3.15. The member of staff performing the procedure is required to clearly document in the medical notes that blood cultures have been taken. The date and time of collection must be recorded on the request form.

2.3.16. Blood culture bottles must be sent to the laboratory as soon as possible via the pneumatic tube system or via porters. Or sent to the satellite laboratory in ED (RCHT) or via couriers/blood bikes in CFT. Inoculated bottles must not be refrigerated if there is a delay in transport to the laboratory. National recommendations indicate there should be less than four hours delay from collection to incubation for blood culture samples reflecting their clinical significance. (UK Health Security Agency UK Standards for Microbiology Investigations. Sepsis and systemic or disseminated infections (S12) January 2023).

2.4. It is RCHT and CFT policy to use the closed system described for obtaining blood cultures because using a syringe needle to transfer venous blood to a blood collection tube or blood culture bottle is both a dangerous procedure and an OSHA-prohibited practice. The BD Vacutainer® blood transfer device is designed with healthcare workers' safety in mind. This latex-free, single-use device reduces the risk of transfer-related injuries while maintaining the specimen integrity required for accurate disease diagnosis.

Blood culture sets for use at community hospital sites may be obtained by contacting the Department of Clinical Microbiology, Royal Cornwall Hospitals NHS Trust on 01872 254966.

3. Related legislation and national and local guidance

- Department of Health (2007) Saving Lives: reducing infection, delivering clean and safe care: Taking Blood Cultures – A summary of Best Practice London DH.
- Public Health England. (2014). Investigation of Blood Cultures (for Organisms other than Mycobacterium species). UK Standards for Microbiology Investigations. B 37 Issue 8.
- RCHT Positive Patient Identification Policy and Procedures.
- RCHT Consent for Examination and Treatment.
- Infection Prevention and Control-Roles and Responsibilities Policy.
- Standard Infection Control Precautions Policy.
- Department of Health (2007) Saving Lives: reducing infection, delivering clean and safe care: Taking Blood Cultures – A summary of Best Practice London DH.
- Department of Health (2010) The Health and Social Care Act; Code of Practice for Health and Adults Social Care on the prevention and Control of infections and Related Guidance London DH.
- Blood culture collection ANTT 2016 v1.1 www.antt.org.

4. Training requirements

RCHT: Provided by Lead Educator, Clinical and Professional Practice, Learning and Development.

CFT: Clinical Skills Facilitators. Initial face to face training and completion of a skills workbook for theory and practical competency is required. Following this a 3 yearly update is then required. Compliance with mandatory training is monitored monthly via CFT Education and Training department.

5. Implementation

This guideline will be circulated to all members of the CFT and RCHT IPAC Committees and the RCHT and CFT Steering Groups to disseminate to their teams.

Via Clinical Facilitators within CFT.

This guideline will be uploaded onto the Trust document library. Details of its availability will be provided by the Trust communication bulletin.

6. Monitoring arrangements

Information category	**Detail of process and methodology for monitoring compliance**
Element to be monitored	Needlestick injury due to lack of compliance.
Lead	Contamination rates and cross infection.
Tool	Occupational Health and Health and Safety Department (contamination issues – Medical Microbiologists).
Frequency	As above (reactive rather than proactive).
Reporting arrangements	Dependent on incident – Datix and other internal reporting systems.
Acting on recommendations and lead(s)	Occupational Health and Infection Prevention and Control (IPAC).
Change in practice and lessons to be shared	Needlestick injury due to lack of compliance.

7. Updating and review

This clinical guideline will be reviewed every 3 years.

8. Equality and diversity

This document complies with the Cornwall Partnership NHS Foundation Trust and Royal Cornwall Hospitals NHS Trust equality and diversity statements. The statements can be found in the RCHT Equality Diversity And Inclusion Policy and CFT Equality, Diversity and Inclusion Statement.

The initial equality impact assessment screening form is at appendix 1.

Appendix 1: Equality Impact assessment Form

Title of clinical guideline or document for assessment: Blood Culture Collection Clinical Guideline V11.0.

Document library section: Clinical / Infection Prevention and Control.

Is this a new or existing document? Existing.

Date of assessment: 26 April 2024.

Person responsible for the assessment: Graham Kaye, Senor IPAC Specialist Practitioner.

What is the main purpose of the document?

To provide guidance for the safe and aseptic collection of blood for blood culture investigations and reduce the risk of sharps injury.

Who is affected by the document?

☒ Staff ☒ Patients ☐ Visitors ☐ Carers ☐ Other ☐ All

The document aims to improve access, experience and outcomes for all groups protected by the Equality Act 2010.

Concerns

Are there concerns that the procedural document could have a differential impact on the following areas?

If a negative impact has been identified, please complete a full EIA by contacting the Equality, Diversity, and Inclusion Team. For RCHT please contact rcht.inclusion@nhs.net and for CFT please contact cft.inclusion@nhs.net

Concern area	Response	If yes, what existing evidence (either presumed or otherwise) do you have for this?
Age	☐ Yes ☒ No	
Disability	☐ Yes ☒ No	
Sex	☐ Yes ☒ No	
Gender reassignment	☐ Yes ☒ No	
Pregnancy and maternity	☐ Yes ☒ No	
Race	☐ Yes ☒ No	
Religion and belief	☐ Yes ☒ No	
Sexual orientation	☐ Yes ☒ No	
Marriage and civil partnership	☐ Yes ☒ No	
Groups at risk of stigma or social exclusion such as offenders or homeless people	☐ Yes ☒ No	
Human rights	☐ Yes ☒ No	

Are there any associated objectives of the document? If yes, what existing evidence (either presumed or otherwise) do you have for this?

No.

Signature of person completing the equality impact assessment:

Name: Graham Kaye.

Date: 26 April 2024.