

To: • Regional medical directors  
cc. • Regional pathology network directors

NHS England  
Wellington House  
133-155 Waterloo Road  
London  
SE1 8UG

**6 April 2023**

Dear Colleagues,

## **Re: Diagnosing sepsis and serious infections**

Managing the timely and accurate diagnosis of infections presents substantial challenges for the NHS, with approximately 130,000 patient blood stream infection episodes in England per year,<sup>1</sup> with an acute trust having approximately 870 episodes per year on average.

Blood cultures are a vital diagnostic test in detecting bloodstream infections. Depending on the extent of under-sampling of blood for blood cultures, by optimising collection there is the potential to yield hundreds of additional blood stream infection diagnoses in an acute hospital trust. Each additional diagnosis offers the chance of improved therapeutic intervention and outcome, noting that, compared to patients with negative blood cultures, the 30-day mortality risk for those with blood stream infection was increased by around 50%.<sup>2</sup>

The chance of obtaining a positive blood culture is closely related to the volume of blood sampled and their optimal (timely) processing. For example, when blood cultures containing a standard vs low volume of blood were compared, the sensitivity of blood cultures for the diagnosis of blood stream infection was 92% vs 69%, respectively.

Multiple other studies have confirmed the effect of blood culture volume for optimising the diagnostic yield of these crucial clinical samples. Notably, in patients with an

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<sup>1</sup> Report: Health Protection Report 2017 Laboratory surveillance of polymicrobial bacteraemia and fungaemia in England, Wales and Northern Ireland: 2017. Available at: [Health Protection Report \(publishing.service.gov.uk\)](https://www.hpa.org.uk/health-protection-report)

<sup>2</sup> Verway M, Brown KA, Marchand-Austin A, Diong C, Lee S, Langford B, Schwartz KL, MacFadden DR, Patel SN, Sander B, Johnstone J, Garber G, Daneman N (2022) Prevalence and Mortality Associated with Bloodstream Organisms: A Population-Wide Retrospective Cohort Study, *Journal of Clinical Microbiology* 20 (4) 60

APACHE II score of >18, the blood stream infection detection rate increased by 3% for each extra millilitre of blood cultured.

Crucially, optimally collected blood cultures offer the opportunity to ensure that targeted antibiotic therapy is administered and so minimise the chance of poor outcomes, including the development of antimicrobial resistance (AMR). AMR is, of course, a global threat and priority for action.

### **Supporting colleagues in best practice**

NHS England has made a series of recommendations to help NHS trusts optimise their blood culture pathway.<sup>3</sup> These are also reflected in recent updates to [microbiology standards by the UK Health Security Agency \(UKHSA\)](#). As senior NHS leaders, you have a pivotal role in implementing these, including:

- Auditing the blood culture pathway in provider organisations to understand performance against national clinical standards.
- Establishing AMR as a core part of quality governance in provider organisations and pathology networks.
- Appointing AMR leads in provider organisations to monitor and drive improvement.

To support the education of staff involved in the blood culture pathway, NHS England, in collaboration with the British Society of Antimicrobial Chemotherapy, has also developed a suite of [e-learning modules](#), outlining the role staff involved in the pathway has in improving patient outcomes from time critical infections.

### **Understanding and improving your organisations blood culture pathway performance**

Determining provider organisations' baseline performance against S12 standards is the first step to improvement. If we can't measure it, we can't improve it. This is achieved through auditing the pre-analytical phase of the blood culture pathway, where blood is collected from the patient, transported to the laboratory, and loaded onto the blood culture analyser.

The Office of the Chief Scientific Officer at NHS England has developed an audit tool to aid this baseline data collection, which is available via the [FutureNHS platform](#).

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<sup>3</sup> Report: NHS England (2022) *Improving the blood culture pathway – executive summary*. Available at: <https://www.england.nhs.uk/publication/improving-the-blood-culture-pathway-executive-summary/>

We are also working with the Care Quality Commission and UK Accreditation Service to ensure these recommendations and audit data is reflected in their laboratory assessments, using ISO 15189:2022 standards.

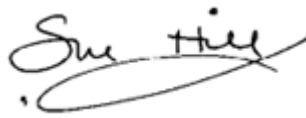
Thank you for your continued efforts in managing infection diagnostics and preserving the vital future use of antibiotics.

If you have any queries relating to the above actions, please contact [england.cso@nhs.net](mailto:england.cso@nhs.net)

Yours sincerely,



**Professor Sir Stephen Powis**  
National Medical Director  
NHS England



**Professor Dame Sue Hill**  
Chief Scientific Officer,  
England



**Professor Mark Wilcox**  
National clinical director for  
antimicrobial resistance  
and infection prevention  
and control