We read with considerable interest the recent article in CMI by Eskira et al. [1], in which the authors described the use of an educational intervention to significantly reduce blood culture contamination (BCC) rates. We agree that this protocol should be considered in settings where BCC rates are a major difficulty, such as the intensive care unit (ICU). Particularly in the ICU, favourable evolutions in healthcare have resulted in a change in the profile of critically-ill patients, making them highly susceptible to infection by opportunistic pathogens. The risk of severe infection means that broad-spectrum empirical antimicrobial agents are administered frequently (and often incorrectly), thereby increasing selection pressure and drug resistance [2]. To focus empirical treatment, site-specific surveillance cultures are taken in our hospital on a routine, thrice-weekly basis [3]. As colonisation with resistant pathogens often precedes infection, these surveillance cultures have proven to be useful in the choice of empirical regimen [4,5]. Eskira et al. [1] reported that 1420 pre-intervention blood cultures and 1618 post-intervention blood cultures were retained for analysis, from which bloodstream infection was diagnosed in 30 (3.6%) and 36 (4.5%) patients, respectively, but no information was provided concerning the pathogens isolated or the number of patients already receiving antimicrobial agents when the blood cultures were obtained.

Furthermore, although blood cultures should be taken at the time of spiking fever, they are often negative at this point. Therefore, the collection of blood cultures should be spread over time to increase the likelihood of microbiological confirmation of bacteraemia or candidaemia [6]. Because of the low sensitivity of blood cultures for detection of microorganisms, this strategy can also be useful in distinguishing true from contaminant bloodstream infection. With these suggestions in mind, we would be interested to know if Eskira and colleagues can elaborate on the indications for which blood cultures were performed.

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homogeneity, only the first culture set from each patient was analysed, we did consider the results of additional culture sets that had been obtained during the same febrile episode in order to determine the significance of growth.

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REFERENCES


Contamination of catheter-drawn blood cultures
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We read with interest the recent article in CMI by Eskira et al. [1] reporting a change in the rate of blood culture contamination following an educational intervention. The authors concluded that this programme of training, in which a number of instructions for obtaining blood via venepuncture were outlined, significantly reduced the rate of blood culture contamination.

Although most blood samples for culture are obtained via the percutaneous route, blood is often obtained from existing intravascular catheters for reasons such as poor venous access, a requirement for frequent blood sampling, and as an aid to the diagnosis of catheter-related bloodstream infection (CR-BSI) using paired blood cultures. The use of percutaneously acquired blood samples has been demonstrated to be more sensitive for the diagnosis of bacteraemia in comparison with catheter-drawn specimens [2,3]. Catheter-drawn blood cultures may be positive because of true bacteraemia, catheter colonisation or catheter contamination, with the latter being responsible for this reduced sensitivity.

The main routes of entry for microorganisms implicated in CR-BSI have been outlined previously [4], and include intra-luminal migration of microorganisms from the hub. Indeed, microbial colonisation of the catheter hub has been described as the initial step in the pathogenesis of CR-BSI acquired via the intra-luminal route, and is responsible for the highest proportion of CR-BSI in patients with long-term central venous catheters [4,5]. A previous study has demonstrated that 22% of stopcock entry ports and 31% of arterial line hubs were contaminated with microorganisms after 72 h in situ, although none of the study patients exhibited clinical evidence of CR-BSI [6]. This highlights the potential of the hub as a source for microbial contamination of catheter-drawn blood samples.

Skin antisepsis used before venepuncture in order to reduce the risk of blood culture contamination has been investigated widely in comparison with research into the prevention of catheter-drawn blood sample contamination. This may, in part, be a consequence of a general discouragement of using catheter-drawn blood for culture because of its reduced sensitivity in aiding the diagnosis of true bacteraemia, and the possibility of increasing the chance of microbial colonisation within the catheter lumen following increased fibrin deposition.

Several strategies to reduce microbial contamination of catheter hubs have been developed. These include the development of a highly porous cleaning swab to remove microorganisms from access ports, frequent heating of metallic hubs, the application of disinfectants, and the use of needle-less connectors [6,7]. With the exception of the application of disinfectants, none of these methods has, to date, been implemented widely in the clinical setting. A previous study [7] demonstrated that chlorhexidine gluconate 0.5% w/v in isopropyl alcohol 70% v/v was more efficacious than isopropyl alcohol 70% v/v or aqueous povidone-iodine 10% w/v for the decontamination of intravenous connections. This is consistent with the recommendation by Eskira et al. [1] for disinfection of skin and bottle injection ports. Another potential method of reducing the risk of contamination is to replace access ports immediately before blood samples are drawn from the catheter.