



Catheter Related Blood Stream Infections in the time of Covid: A cause for concern



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Introduction

Catheter-related bloodstream infections (CRBSIs) are a major cause of morbidity and sometimes mortality in all patients with intestinal failure (IF) requiring parenteral nutrition (PN) support¹. The European Society of Clinical Nutrition and Metabolism (ESPEN) guidance states that the aim for a Nutrition Support Team (NST) is to have a CRBSI rate of less than 1 per 1000². Variables that have been shown to influence CRBSI rates are shown in table 1³.

Methods

An apparent rise in CRBSI rates over a three month period in our in-patient cohort led to a 'deep dive' of cases. A retrospective case note review was undertaken by members of the NST in pairs. The findings were cross-referenced with microbiology data and comparative data sought from local Intensive Care and Renal Dialysis services.

Results

The annual CRBSI rate recorded by the NST is usually less than 2 per thousand catheter days, see table 1. From October to December 2021 the CRBSI rose to 10 (10 cases in 1090 line days).

Table 1

Annual CRBSI rates (per 1000 catheter days)
2019 – 1.96
2020 – 1.51
2021 – 10.0 (Oct – Dec retrospective data)

Outcome of investigation

- Infections occurred in clinical units that are familiar with CVC care (such as intensive care, oncology, and renal).
 - No single clinical factor could be attributed to the sharp increase in CRBSI.
- Detailed microbiology assessment suggested primary CRBSI in 60% - 70% of cases; causality could not be directly attributed in 30% of cases.
 - There were no common organisms and no Staphylococcus species.
 - Nationally reportable organisms were seen in two cases.

Discussion

A quality summit was held and Root Cause Analysis (RCA) undertaken. Key areas for learning and action were compared to the ESPEN CRBSI variables and results are shared in table 2, showing a significant overlap, but also specific local differences. We suggest that the COVID-19 pandemic has led to significant workforce challenges with patients being cared for by staff who may be unfamiliar with PN administration. Only certain organisms are subject to mandatory reporting (inc. Staphylococcus and certain Gram-negative bacterial species⁴); therefore, comparative data for CRBSI (as expressed by total infection rate per line days) was unavailable.

Table 2

ESPEN CRBSI variables	Local factors that influenced our CRBSI rates
<ul style="list-style-type: none"> ➤ Education and training ➤ Experience in the MDT ➤ Person responsible for CVC care ➤ Duration of HPN ➤ Nature of underlying disease ➤ Patient age ➤ Intestinal anatomy ➤ Opiate dependence 	<ul style="list-style-type: none"> ➤ Education and training - only virtual ➤ Experienced MDT and NST - redeployed ➤ Ward skill mix - redeployment impact ➤ Sharing data and learning between specialities – not common practice ➤ Clear and standardised documentation - new digital systems ➤ Mandatory reporting - does not capture all isolated organisms

An action plan has been implemented to tackle the challenges identified in the RCA. Our current CRBSI rate is 2.87 demonstrating that more work still needs to be done.

¹ Dobb M, Teubner A, Theis V, *et al.* Review article: the management of long-term parenteral nutrition. *Aliment Pharmacol Ther* 2013;37:587–603.

² Pironi L, Arends J, Bozzetti F, *et al.* ESPEN guidelines on chronic intestinal failure in adults. *Clin Nutr* 2016;35:247–307

³ Bond A, Chadwick P, Smith TR, *et al.* Diagnosis and management of catheter-related bloodstream infections in patients on home parenteral nutrition. *Frontline Gastroenterology* 2020;11:48–54.

⁴ <https://www.england.nhs.uk/patient-safety/preventing-gram-negative-bloodstream-infections/>