
A five-year retrospective review of catheter related bloodstream infection in South Australia home parenteral nutrition patients

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Background



CRBSI is a major complication in HPN, associated with high morbidity and mortality



CRBSI rate - Key quality indicator of HPN care



Reported rates vary between institutions



CRBSI diagnosis: clinical symptoms + microbiology



Management: early diagnosis, early empiric IV antibiotics, catheter salvage for long term HPN patients

Aim of the study

To review the:

- CRBSI rate at SA HPN Service
- Causative pathogens
- Management strategies
- Outcomes (catheter salvage vs removal)

Methods

Design: Single-centre, retrospective cohort

Period: 5-year period 2020-2024

Population: Adult HPN patients in SA

Data: Demographics, CRBSI episodes, incidence, catheter types, pathogens, management & outcomes

Analysis: Descriptive statistics (mean, IQR, %)

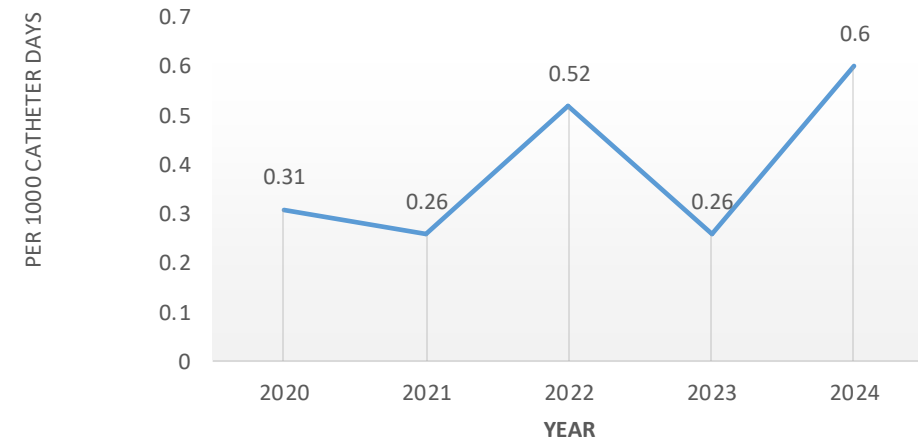
Table 1. Overview of CRBSI in SA HPN patients over 5-year period

Total Number of HPN Patients	N=78
CRBSI positive Episodes	N=14
Total catheter days	35,489
Mean CRBSI Rate (IQR) per 1,000 catheter days	0.39 (0.26-0.56)
Baseline Characteristics of the positive patients	
Male / Female, n	1 Male/5 Female
Age, v. median (range)	37 (20-84)
Indications for HPN	
Pan-intestinal dysmotility	1
Short Bowel Syndrome	3
Complications post bariatric surgery	1
Duodenum stricture	1
Mean Duration on HPN, days, n(IQR)	721 (897-2455)
Mean PN bags per week	5 bags per week
Infected CVAD	
Tunnelled CVC	N=11 (10 Hickman, 1 polyurethane tunnelled line)
PICC line	N=3
Pathogens	
Fungi: Candida glabrata/tropicalis/parapsilosis	4
Gram+: Staphylococcus aureus, Staphylococcus caprae, Staphylococcus epidermidis	2
Gram- bacteria: (Escherichia coli, Pseudomonas, Enterobacter cloacae, Klebsiella pneumoniae, Proteus mirabilis, Serratia marcescens)	6
Polymicrobial (Fungi + Gram+/Gram-)	2
Treatment	
IV antifungal	3
IV antibiotics	8
IV antifungal + antibiotics	3
Ethanol locks sterilisation (daily for 3 days)	14
Hospital admission	9
Outpatient treatment	5
Outcomes	
Line salvage attempted	All 11 Tunnelled catheters, 3 PICC line removed without attempting
Line salvage rate	81% (9/11)
Preventative methods	
Routine Taurolidine locks	76 (97%)
3M Curodis disinfectant caps	100% since 2023
Regular audit for ANTT and compliance	For recurrent CRBSI

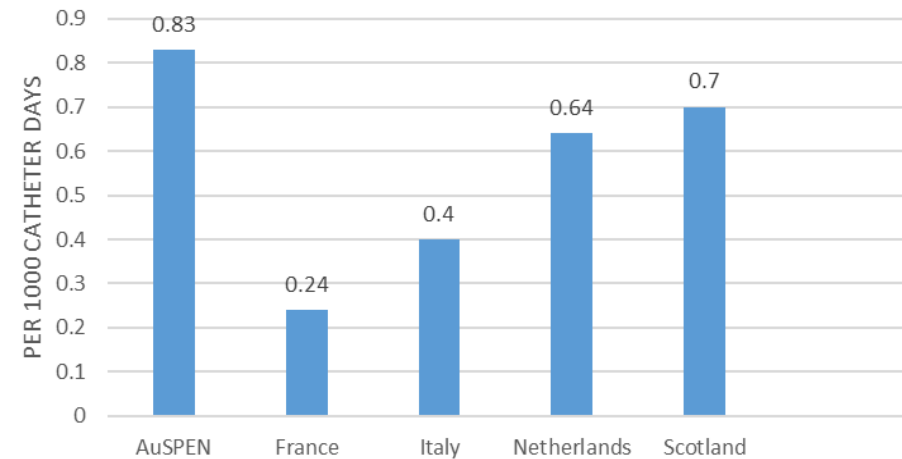
Results: CRBSI Rates

- **Number of HPN patients:** 78
- **Mean HPN duration:** 721 days
- **CRBSI episodes:** 14 (in 6 patients)
- **Total catheter days:** 35,489 days
- **Incidence:** 0.39/1,000 catheter days (IQR 0.26–0.56)

SA HPN CRBSI Rate Year 2020-2024



Reported CRBSI Rates Internatioanlly



Results: Microbiology

- Gram-negative:** 43% (n=6)

Escherichia coli, Pseudomonas,

Enterobacter cloacae, Klebsiella pneumoniae,

Proteus mirabilis, Serratia marcescens

- Fungal:** 29% (n=4)

Candida glabrata, candida tropicalis,

Candida parapsilosis

- Gram-positive:** 14% (n=2)

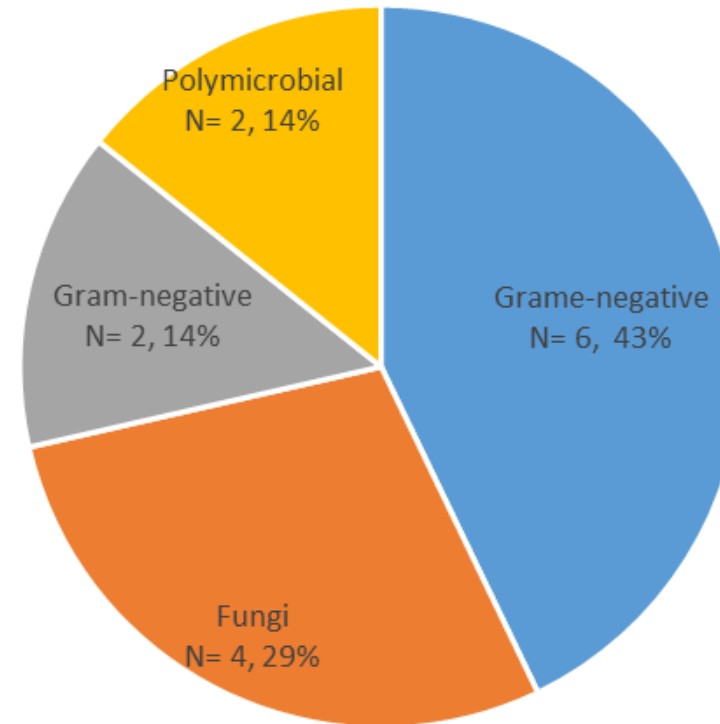
Staphylococcus aureus, Staphylococcus caprae,

Staphylococcus epidermidis

- Polymicrobial:** 14% (n=2)

Candida glabrata + gram positive, candida glabrata
+ gram positive and gram negative

CRBSI Pathogens



Results: Management

- **Early empiric IV antimicrobial**
 - Dual antibiotics: Beta-Lactams + Glycopeptides
 - Antifungal IV for patients with previous fungal infection
- **Tailored IV antibiotics, antifungal**
- **Infuse antimicrobial infusion via infected CVAD**
- **70% Ethanol locks (for 3 days only) – biofilm eradicate**
- **Taurolidine locks – long term use, biofilm prevention**
- **Attempt catheter salvage whenever safe**



Antibiotics	Total/percentage	Treatment Duration
Empiric: Beta-Lactams + Glycopeptides ±Anidulafungin	100%	1-3 days
Piptaz	7	4weeks
Vancomycin	5	2 weeks
Teicoplanin	2	3 days
Ceftriaxone	3	2 weeks
Flucloxacillin	2	2 weeks
Meropenem	2	2 weeks
Anidulafungin	6	6 weeks
Voriconazole IV	2	1 weeks
Voriconazole oral (step down)	6	2 weeks

Results: Outcome

- **Catheter salvage:**
 - Attempted salvage for all 11 tunneled lines (10 Hickman catheters, 1 polyurethane cuffed line)
 - 9 lines saved
 - Successful salvage rate: 81%
 - Salvage was not attempted for 3 PICC lines
 - **Line removal**
 - 2 lines removed: 1 severe fungaemia, 1 polymicrobial infection
 - **Deep-seated infections**
 - not identified (Echo, ophthalmological exam)
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Conclusion

- Overall CRBSI incidence for SA HPN: 0.39/1,000 catheter days
- Most common organisms: Gram-negative, high prevalence of fungal infection
- Successful catheter salvage rate: 81%
- SA HPN CRBSI management practice is both evidence and experience based
- Limitation of study: single centre small cohort study