

EXTENDED SPECTRUM BETA-LACTAMASE (ESBL) PRODUCING GRAM NEGATIVE BACILLI: INFECTION CONTROL MANAGEMENT - CHW

PRACTICE GUIDELINE [®]

DOCUMENT SUMMARY/KEY POINTS

- When ESBL-producing bacteria colonise patients they usually reside in the bowel without causing signs of infection.
- ESBL-producing bacteria are usually spread by contact, directly via hands of health care workers or indirectly via contaminated items or equipment.
- There is currently no clearance protocol for these organisms.
- Standard and contact precautions apply.
- All known children with ESBL are flagged with a risk code of "G" on the PMI system.
- A child colonised or infected with ESBL must be admitted to a single room on any ward, or cohorted with other ESBL-carriers after discussion with the Infection Prevention Control consultant on call. The door of the room must remain closed.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1 st March 2015	Review Period: 3 years
Team Leader:	Clinical Nurse Consultant	Area/Dept: Infection Control

CHANGE SUMMARY

- Minor word edits made throughout the guideline. The document needed to clearly state the PPE and the precautions needed.
- Addition of information in Powerchart in the Infection Control Measures section.

READ ACKNOWLEDGEMENT

- Nursing staff working in clinical areas should read and acknowledge this document.
- Medical staff, in particular Surgeons, should read and acknowledge this document.

TABLE OF CONTENTS

Introduction	3
Transmission	3
Risk of Acquisition	3
Treatment	3
Screening	4
<i>Patients</i>	4
<i>Environmental</i>	4
Clearance	4
Infection Control Measures	4
Management	4
Patients	4
<i>Admission</i>	4
<i>Emergency Department</i>	5
<i>Outpatient Department</i>	5
<i>Medical Imaging</i>	5
<i>Theatres</i>	5
<i>Bear Cottage</i>	5
Visitors and siblings.....	6
Equipment and Environment	6
References	6
Isolation Information Factsheet	7
Extended Spectrum Beta-Lactamase (ESBL) Producing Gram Negative Bacilli	7
<i>PATIENT / PARENT</i>	7

Introduction

Coliform bacteria, such as *Escherichia coli*, *Klebsiella* or *Enterobacter*, can become resistant to our usual antibiotics. One of the ways they can do this is by acquiring genes encoding enzymes that destroy important antibiotics including many penicillins and cephalosporins (beta-lactams). These enzymes are known as extended-spectrum beta-lactamases (ESBLs). They pose a particular infection control problem because the resistant genes are easily transmitted to other unrelated bacterial species. Genes for resistance are often carried and transmitted in groups or cassettes, and as a result ESBLs are often associated with resistance to several other classes of antibiotic.

Excessive use of broad spectrum antibiotics, such as cefotaxime and ceftriaxone, is thought to be the main factor in selecting for these highly resistant ESBL-producing organisms. Quinolone antibiotics such as ciprofloxacin are also potent promoters of ESBL transmission. The hospital Antimicrobial Stewardship policy, which limits the use of these high-risk drugs, is one of the ways we try to prevent spread of these bacteria. The other way is by careful adherence to contact precautions, particularly hand hygiene, for all patients (not just those who are known to carry these bacteria).

Not all resistant organisms are ESBL-producers. Particular laboratory tests are required to confirm ESBL production. If in doubt, discuss with the Microbiology registrar or consultant.

Transmission

ESBL-producing organisms are usually spread by contact, directly via hands of health care workers or indirectly via contaminated items or equipment.

In a study of adult hospital ESBL transmission (Kaier 2009), the significant risk factors promoting ESBL spread were broad spectrum cephalosporin use, quinolone (ciprofloxacin) use, and admission of patients already colonised by ESBL-producing bacteria. The main protective factor was staff usage of alcohol-based hand rub.

Risk of Acquisition

Those at highest risk of infection and/or colonisation include:

- Immunocompromised and transplant patients
- Premature babies
- Recent inpatients in a high-risk setting such as ICU and NICU.
- Patients who have had frequent or long term antibiotic therapy
- Patients who have intravascular lines, indwelling urinary catheters, long-term ventilation or multiple surgical procedures.

ESBL transmission is now common in the community, and potential risk factors for community-acquired ESBL include travelling in South, Southeast or East Asia.

Treatment

Patients who are colonised with ESBL-producing bacteria (when the bacteria are not causing any ill-effects) do not require any antibiotic therapy. When these organisms cause infection such as sepsis, urinary tract infection or wound infection, treatment is required with antibiotics which are reported by the laboratory to be active against the bacteria. If in doubt, discuss with the microbiology advanced trainee or consultant.

Screening

Patients

As directed by Infection Control and TB Surveillance. *Page: 6131, 6550, 6655 or Ext 52578/ 52534*

Environmental

As directed by Infection Control and TB Surveillance.

Clearance

There is currently no clearance protocol for these organisms.

Infection Control Measures

Standard and contact precautions apply.

Refer to CHW [Infection Control: Isolation Practice Guidelines](#)

All known children with ESBL are flagged with a risk code of "G" on the PMI system.

The front page of Powerchart is flagged with the details of the MRO in the Active Problems & Clinical Alerts section

Management

Patients

Admission

- A child colonised or infected with ESBL must be admitted to a single room on any ward or cohorted with other ESBL-carriers after discussion with the infection control consultant on call. The door of the room must remain closed. Standard and contact precautions apply.
- Rooms with a dedicated private bathroom are preferred however when not available, the child may use the ward bathroom; any shared bathroom must be cleaned thoroughly after each use.
- Hands must be washed with alcohol-based hand rub (ABHR) on entering and when leaving the child's room. If hands are visibly soiled, they should first be cleaned with soap and water before ABHR use.
- Ronald McDonald House managers should be informed well in advance of any possible discharge to the House to enable appropriate placement.
- The child should not visit any of the dining areas within the hospital or the Starlight Room.
- The child should not visit other inpatients.

Emergency Department

- A child colonised or infected with ESBL must be placed in a single room and the door kept closed.
- Standard and contact precautions apply.
- The room and all equipment in contact with the patient must be cleaned as per CHW cleaning policy. This also applies to any bathrooms that are used.

Outpatient Department

- A child colonised or infected with ESBL must be segregated in high-risk clinics such as Gastroenterology or the Oncology Treatment Centre (OTC). In general clinics, segregation is not required. However strict compliance with standard precautions including hand hygiene and cleaning of reusable patient-care equipment is essential
- Standard and contact precautions apply in high-risk clinics
- The room and all equipment in contact with the patient must be cleaned as per CHW cleaning policy.

Medical Imaging

- The Medical Imaging Department must be informed of the child's ESBL status by the transferring area prior to patient transfer.
- Standard and contact precautions apply.
- The room must be cleaned as per CHW cleaning policy.

Theatres

- The Theatre Department must be informed of the child's ESBL status by the transferring area prior to patient transfer.
- A child colonised or infected with ESBL requiring surgery should be scheduled on the theatre list according to their clinical priority, regardless of their ESBL status
- Standard and contact precautions apply.
- Staff must wear long sleeved cuffed gowns and gloves when in direct contact with the patient.
- Recovery should occur in an isolated area if possible.
- The room and all equipment in contact with the patient must be cleaned as per CHW cleaning policy.

Bear Cottage

- Patients colonised with ESBL-producing bacteria are permitted at Bear Cottage
- Bear Cottage staff should be particularly vigilant with Hand Hygiene compliance when caring for such children.

Visitors and siblings

The child may have visitors but the visitors must not visit other children in the ward or use the communal playroom.

Equipment and Environment

- The room must be thoroughly cleaned daily with neutral detergent.
- Equipment used should be dedicated for the sole use of the patient for the duration of their stay. If equipment is removed during the admission or at the end of the admission, it is to be cleaned thoroughly with 70% isopropyl alcohol impregnated wipes.
- Normal cutlery and crockery can be used; no special washing up procedure is required.
- No special handling of linen is required.

References

1. NSW Health Infection Control Policy: Prevention and Management of Multi-Resistant Organisms (MRO). http://www.health.nsw.gov.au/policies/pd/2007/pdf/PD2007_084.pdf (accessed 24/2/15)
2. Paterson DL., Infection control implications of extended spectrum beta-lactamase (ESBL) production by Klebsiella and other Gram negative bacteria. Australian Infection Control Journal, 2001 6, 3:72 – 80.
3. Seigel JD., et al for the Healthcare Infection Control Practices Advisory Committee (HICPAC). Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006. <http://www.cdc.gov/hai/> (accessed 24/2/15)
4. Mackenzie FM, Gould IM. (1998) Extended spectrum beta-lactamases. J Infect; 36: 255-8.
5. Quinn JP. (1994) Clinical significance of extended-spectrum beta-lactamases. European Journal of Clinical Microbiology; 13: S39-42.
6. Barker KF. (1997). Infection control in hospitals – sinks or swim? British Medical Journal; 315(7118): 1315-1316
7. ESBLs (extended spectrum beta lactamases) *Washup* The Royal Children's Hospital Melbourne: http://www.rch.org.au/washup/prof.cfm?doc_id=5001 (accessed 24/2/15)
8. Kaier K et al (2009). The impact of antimicrobial drug consumption and alcohol based hand rub use on the emergence and spread of extended spectrum B-lactamase-producing strains: a time-series analysis. Journal of Antimicrobial Chemotherapy 63: 609-14
9. Australian Commission on Safety and Quality in Healthcare "Australian Guidelines for the Prevention and Control of Infection in Healthcare. Australian Government National Health and Medical Research Council 2010

Copyright notice and disclaimer:

The use of this document outside Sydney Children's Hospitals Network (SCHN), or its reproduction in whole or in part, is subject to acknowledgement that it is the property of SCHN. SCHN has done everything practicable to make this document accurate, up-to-date and in accordance with accepted legislation and standards at the date of publication. SCHN is not responsible for consequences arising from the use of this document outside SCHN. A current version of this document is only available electronically from the Hospital. If this document is printed, it is only valid to the date of printing.

Isolation Information Factsheet

Extended Spectrum Beta-Lactamase (ESBL) Producing Gram Negative Bacilli

PATIENT / PARENT

- Child to be nursed in a single room or after agreement, cohorted with other children with ESBL.
- Hands must be washed, or cleaned with alcohol-based hand rub on entering the child's room.
- Hands must be washed, or cleaned with alcohol-based hand rub, on leaving the child's room.
- Contact Precautions apply.
- Door to the room to remain closed whilst the child is in the room.
- Movement from the room is restricted to outdoor areas or main corridor for discharge or transfer within the hospital.
- The child cannot use the Starlight Room.
- The child cannot visit any of the dining areas within the hospital.
- The child cannot visit other inpatients, or receive inpatient visitors.
- The child cannot attend the schoolroom without prior negotiation.
- When bathed in ward bathroom, the bathroom must be cleaned thoroughly after use.
- The child can use the communal toilet only if continent; it must be cleaned after use.
- Restrictions do not apply when the child is not within a healthcare facility, because hospitalised children are more susceptible to transmission of and infection with ESBL.

For further information please contact the Infection Control - Page No: 6131, 6550, 6655 or Ext 52578/52534.

Negotiation can be made on individual cases with Infection Control