

<b>EXTENDED SPECTRUM BETA-LACTAMASE (ESBL) PRODUCING ORGANISMS PROTOCOL</b>	<b>Clinical Guideline</b> <b>Register No: 06055</b> <b>Status: Public</b>
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## **Appendix 1 Patient Information about ESBL**

## **1.0 Purpose**

- 1.1 Highly resistant strains of gram negative bacteria such as *Escherichia coli* and *Pseudomonas* have become widespread. Strains are able to destroy a large number of common antibiotics, making the infections they cause very difficult to treat. The bacteria produce enzymes called extended-spectrum  $\beta$ -lactamases (ESBLs) that destroy and confer resistance to antibiotics. The purpose of this guideline is to reduce the risk of ESBL strains spreading between hospital patients. Patient information leaflet contains more information about ESBL.
- 1.2 To comply with the Health and Social Care Act 2008, trusts must have and adhere to policies designed for the individual's care that will help to prevent and control infections.

## **2.0 Scope**

- 2.1 This policy applies to all inpatients identified as ESBL positive by the microbiology laboratory.

## **3.0 Responsibilities**

### **3.1 Managing Director**

The Managing Director has overall responsibility for ensuring that the Trust has the necessary management systems in place to enable the effective implementation of this policy and overall responsibility for the health and safety of staff, patients and visitors.

### **3.2 Director of Nursing**

The Director of Nursing has strategic responsibility for ensuring systems are in place to facilitate the nursing staff's awareness of this policy and appropriate support is given to enable staff in delivering practice as outlined in this policy.

### **3.3 Chief Medical Officer**

The Chief Medical Officer has strategic responsibility for ensuring systems are in place to facilitate awareness of this policy and to ensure that appropriate support is given to enable medical staff in delivering practice as outlined in this document.

### **3.4 Director of Infection Prevention and Control (DIPC)**

- 3.4.1 The DIPC will have operational responsibility for the effective implementation of this policy.

- 3.4.2 The DIPC will give expert advice around the care of patients with an ESBL and liaise with the medical teams when a positive result is received.
- 3.4.3 Liaise with the patient's GP if required when a result becomes available following patient discharge.
- 3.4.4 The DIPC will include the number of ESBL cases in blood cultures and those from clinical specimens in both hospital and community in the monthly and annual DIPC report.
- 3.4.5 In the event of an outbreak (two or more cases epidemiologically linked), the DIPC will chair the outbreak meetings and determine appropriate actions to be taken.
- 3.4.6 The DIPC will include details of all outbreaks in the monthly and annual DIPC report.
- 3.4.7 Liaise with outside agencies when required.
- 3.5 **Infection Prevention and Control Team (IPT)**
  - 3.5.1 To ensure all staff are made aware of this policy and have access to the ESBL patient information leaflet.
  - 3.5.2 To inform the ward staff and medical team of a positive result.
  - 3.5.3 To offer expert advice for risk assessments required to prioritise the use of single rooms / cohort nursing and the standard infection prevention precautions required.
  - 3.5.4 To support medical and nursing staff in explaining the result to the patient if required.
  - 3.5.5 To arrange for a positive result reported after discharge to be sent to the patient's GP.
  - 3.5.6 To investigate promptly if there is more than one case on the same ward / department to determine whether the cases are epidemiologically linked. To collate all the necessary information and feed this back to the DIPC
- 3.6 **All staff**
  - 3.6.1 To comply with this policy.
  - 3.6.2 To liaise with the IPT if advice and support is needed regarding: patient placement, the infection prevention precautions required or explaining the result to the patient.

- 3.6.3 Team caring for the patient to explain the result to the patient and ensure a patient information leaflet is provided.  
[http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/ESBLs/GeneralInformation/link to intranet](http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/ESBLs/GeneralInformation/link%20to%20intranet)
- 3.6.4 All staff have a responsibility to ensure that infection prevention is embedded into their everyday practice and applied consistently at all times
- 3.6.5 Medical staff to comply with the antimicrobial policy

#### **4.0 Equality and Diversity**

- 4.1 Mid Essex Hospital Services NHS Trust is committed to the provision of a service that is fair, accessible and meets the needs of all individuals.

#### **5.0 Background**

- 5.1 ESBL producing bacteria are antibiotic resistant strains of E. coli.
- They are very common bacteria normally living harmlessly in the gut
  - The enzyme they produce make the infections more difficult to treat
  - Faeces, urine and moist skin sites are the most common sites for colonisation or infection

#### **6.0 Route of transmission of ESBL producing bacteria**

- 6.1 ESBL producing coliforms survive best in moist environments. Endemic strains may persist in health care settings for years because of patient colonisation, environmental contamination and hand transmission.
- 6.2 Person to person spread via the hands of healthcare workers is thought to be the main route of transmission for ESBLs in the health care environment
- 6.3 ESBL can be introduced into the gut flora via the faecal oral route and establishes itself in small numbers as a result of a break down in infection control precautions. Faecal colonisation may play a critical role in facilitating spread.
- 6.4 Some ESBL outbreaks have been attributed to contaminated medical devices (e.g. ultrasound gel). Commodes, toilets, wheelchairs, floors, sinks, linen and medical devices may all become contaminated.

#### **7.0 At Risk Groups**

- 7.1 The colonisation rate for ESBLs is low in healthy individuals in the general population.

7.2 Patients who have underlying medical conditions and who are already very sick, and the elderly have an increased risk of being colonised with ESBLs

7.3 Those who have indwelling devices especially urethral catheters are at increased risk.

## **8.0 Infections Caused by ESBL Producing Bacteria**

8.1 Many ESBL infections will be urinary tract or gut associated, although they may cause other infections e.g. pneumonia and blood stream infections.

8.2 Infections with ESBLs are a concern for the following reasons:

- The infections they cause are difficult to treat because the ESBL enzymes produced by the bacteria destroy a large number of common antibiotics.
- Patients may experience significantly longer hospital stays with increased costs.

## **9.0 Pathology Specimens**

9.1 Standard infection prevention precautions apply.

9.2 Clinical details, recent and current antibiotic history must be written on the request form.

## **10.0 Treatment of ESBL- producing Bacteria**

10.1 Asymptomatic patients do not require treatment neither do those with resolving or very mild symptoms.

10.2 Medical staff to review the requirement for antibiotic(s) with advice from the Consultant Microbiologist if needed. Inappropriate use of antibiotics may encourage colonisation and secondary infection.

10.3 Any serious infection that may be due to ESBL bacteria should include antibiotics to which the organism is known to be susceptible.

## **11.0 Prescribing Antibiotics**

11.1 Prescriptions to be prescribed according to the Trust Antibiotic Guidelines.

11.2 There should be a daily review of the need for continuation of antibiotics for all patients on antibiotics with the clinical indication documented in the drug chart and the patient notes

11.3 In an outbreak situation, Consultant Microbiologist and Antimicrobial Pharmacist may suggest interim alternative antibiotic prescribing to clinicians

## 12.0 Preventing the Spread

12.1 Standard infection prevention precautions such as hand hygiene, appropriate use of personal protective equipment (PPE), environmental cleaning, and restriction of antibiotics, have been shown to be effective in preventing transmission in outbreak situations.

### 12.2 Hand Hygiene

12.2.1 Hand hygiene is a simple and effective infection prevention and control intervention. Hand washing with soap and water is effective; however alcohol hand rubs are a quick and accessible alternative when hands are not visibly soiled and are very effective at killing ESBL bacteria when used correctly. Improving hand hygiene compliance will significantly reduce the risk of healthcare associated infection.

12.2.2 It is vital to perform hand decontamination following the 5 moments of hand hygiene

12.2.3 Hands must be washed with soap and water when visibly soiled prior to leaving the isolation room

12.2.4 Hands must be cleansed with alcohol hand rub immediately after leaving the isolation room.

12.2.5 Encourage the patient to decontaminate their hands after using the toilet and before eating.

12.2.6 Visitors should be instructed to decontaminate their hands on entry and when leaving the room.

12.2.7 The use of gloves **does not** replace the need to decontaminate hands.

### 12.3 Isolation

12.3.1 The decision to isolate a patient should be based on the infection risk and routes of transmission should be considered. The risk assessment tool in the Isolation policy should be used to assist with prioritisation of side room allocation. The IPT will also advise. This assessment must be documented in the nursing notes

12.3.2 If possible, the patient should be isolated in a single room, ideally with ensuite facilities according to the isolation policy. If a toilet is not available a commode must be designated for the sole use of that patient. It must be thoroughly cleaned after each use. A standard isolation poster must be placed on the outer door of the single room and can be found in the isolation policy

12.3.3 If more than one patient is affected, these may be cohort nursed, on the

advice of the IPT.

#### **12.4 Duration of isolation**

- 12.4.1 Isolation should be continued until the patient is discharged or a patient with a higher infection risk requires isolation. Please see isolation risk assessment in isolation policy.
- 12.4.2 If the patient is isolated due to diarrhoea then they may be moved out of isolation once they are 48 hours free from symptoms
- 12.4.3 Any queries must be discussed with the IPT

#### **12.5 Protective clothing**

- 12.5.1 Disposable aprons should be used by all staff giving direct care to the isolated patient
- 12.5.2 Disposable gloves and apron should be worn where there is likely to be contact with bodily fluids and when handling contaminated items e.g. dressings.
- 12.5.3 Visitors only need to wear gloves and apron when giving direct care
- 12.5.4 For standard isolation, protective clothing is not required if entry to the room involves delivering meals, drugs or simply to talk to the patient. However, hand hygiene must still be undertaken on entry and exit of the room.
- 12.5.5 Prior to exit from the room, aprons and gloves must be removed and placed in a clinical waste bin followed by thorough hand decontamination. Alcohol hand rub must be applied after leaving the room.

#### **12.6 Disposal of faeces/urine**

- 12.6.1 Excreta can be disposed of directly into the toilet adjoining the room. If no toilet is available, a designated commode should be used.

#### **12.7 Disposal of clinical waste**

- 12.7.1 Any waste from the isolation room must be disposed of in the orange waste stream.

#### **12.8 Cutlery/crockery**

- 12.8.1 Cutlery and crockery must be washed in the ward dishwasher. Disposable is not required.

## **12.9 Medical equipment**

12.9.1 Use single patient use equipment whenever possible. If equipment is to be used on other patients ensure it is decontaminated after each use following the manufacturer's guidelines

## **12.10 Room cleaning**

12.10.1 Rooms must be cleaned daily, paying special attention to dust-collecting areas and horizontal surfaces according to the cleaning policy and isolation policy.

12.10.2 If the patient is being cared for in isolation, a terminal clean must be carried out on discharge.

## **12.11 Linen**

12.11.1 Use a water-soluble clear bag then put into a white bag. Refer to the linen policy.

## **12.12 Visitors**

12.12.1 Encourage visitors not to have contact with other patients in the ward or hospital, or if visiting more than one patient, to visit the isolated patient last.

12.12.2 Visitors need only wear protective clothing if they are going to be involved in direct care.

12.12.3 Visitors should be instructed to decontaminate their hands on entry and leaving the room.

## **13.0 Decolonisation**

13.1 There has been no successful decolonisation therapy described. Even once the selective pressure of antibiotics has been removed the ESBL organism may persist in the gut flora at very low levels.

## **14.0 Discharge from Hospital**

14.1 The presence of ESBL must not impede the discharge of the patient to their own home or alternative care facilities. However if the patient is discharged to alternative care facilities then the presence of ESBL must be communicated to the GP and the admitting facility in the discharge summary.

14.2 If the patient is discharged to another hospital then the receiving ward and Infection Prevention Team of the receiving hospital must be informed.

14.3 Following discharge or transfer, a terminal clean of the room is required according to the cleaning policy. The curtains must also be changed.

## **15.0 Outbreaks**

- 15.1 If there is an outbreak (two or more cases epidemiologically linked), patient screening will be used for control purposes on the advice of the IPT
- 15.2 Identified cases should be isolated in single rooms and standard infection prevention precautions maintained
- 15.3 Continue to screen exposed patients weekly until the outbreak ends. The end of the outbreak will be declared by an outbreak control group.
- 15.4 Outbreaks of infection caused by ESBL producing organisms will be reported as serious untoward incidents associated with infection. The Essex Health Protection Unit will be notified should such a course of action be taken.

## **16.0 Surveillance**

- 16.1 The DIPC will include in the monthly and annual DIPC report the number of ESBL cases in blood cultures and those from clinical specimens in both hospital and community
- 16.2 Cases of ESBL bacteraemia are reported to Public Health England by the DIPC as part of mandatory reporting of infections.

## **17.0 Audit and Monitoring**

- 17.1 Compliance with this policy will be monitored as part of the Infection Prevention and Control audit programme and results are reported in the divisional scorecards which are monitored at The Infection Prevention and Control Group. Directorates are required to develop localised action plans as appropriate.
- 17.2 The Infection Prevention and Control Group reviews the Infection Prevention and Control policies.
- 17.3 Any untoward incidents around ESBL would be recorded in the monthly DIPC report and shared across the organisation as appropriate.

## **18.0 Implementation and Communication**

- 18.1 This policy will be issued to the following staff groups to disseminate. ;
  - Ward Sisters/Charge nurse
  - Bed Management Team / Service Co-ordinators
  - Clinical Directors
  - Heads of Nursing and Lead Nurses
  - Hotel Services Manager

18.2 The guideline will also be issued via the Staff Focus and made available on the Intranet and Website with a hard copy available in the Ward/Department Infection Prevention Policy folder.

## 19.0 References

Department of Health (2015) *The Health and Social Care Act 2008 Code of Practice for the NHS on the prevention and control of healthcare associated infections and related guidance*

[http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/documents/digitalasset/dh\\_093761.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_093761.pdf)

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D M Livermore, N Woodford. Guidance to diagnostic laboratories: Laboratory Detection and Reporting of Bacteria with Extended-spectrum R-lactamases. Health Protection Agency, London, 2004. Available via

<https://www.gov.uk/government/organisations/public-health-england>

Investigations into multi-drug resistant ESBL producing Escherichia coli strains causing infections in

England. Available via [www.gov.uk/government/organisations/public-health-england](http://www.gov.uk/government/organisations/public-health-england)

Department of Health (2007) Saving Lives: reducing infection, delivering clean and safe care. Isolating patients with healthcare-associated infection.

Marsden Manual (2008) Barrier Nursing: Nursing the Infectious or Immunosuppressed Patient. The Royal Marsden Hospital. Wiley-Blackwell.

Loveday, H. P. Wilson, J. A. Pratt, R. J. Golsorkhi, M. Tingle, A. Bak, A. Browne, J. Prieto, J. Wilcox, M. (2014) EPIC 3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England.

[http://www.his.org.uk/files/3113/8693/4808/epic3\\_National\\_Evidence-Based\\_Guidelines\\_for\\_Preventing\\_HCAI\\_in\\_NHSE.pdf](http://www.his.org.uk/files/3113/8693/4808/epic3_National_Evidence-Based_Guidelines_for_Preventing_HCAI_in_NHSE.pdf) (Accessed May 2017)

Extended Spectrum Beta Lactamases- frequently asked questions. Available via:

<http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/ESBLs/GeneralInformation/>

### **Patient Information about ESBL**

Extended spectrum beta-lactamase producing coliforms are identified in the laboratory by their resistance to both second and third generation cephalosporins, and to aztreonam.

The significance of these findings clinically is that ESBLs are resistant to all penicillins and cephalosporins. In addition they are frequently resistant to other antibiotics such as trimethoprim, ciprofloxacin and aminoglycosides.

ESBLs are often susceptible to Nitrofurantoin (suitable for uncomplicated UTI only) and usually sensitive to carbapenems such as Meropenem.

A gene described as 'New Delhi' produces a Metallo beta lactamase which confers resistance to meropenem and ertapenem, leaving colistin as the sole sensitive antibiotic.

Many ESBL infections will be urinary tract or gut associated, although they may cause other infections e.g. pneumonia.

Infections with ESBLs are a concern for the following reasons:

- They are difficult to treat because they carry plasmids that confer resistance to many antibiotics.
- Patients may experience significantly longer hospital stays with increased costs.
- Patients with infections have an increased risk of death. The colonization rate for ESBLs is low in healthy individuals in the general population; however it is increased in hospitalised patients, especially during prolonged hospitalisation or antibiotic therapy. ESBLs are primarily identified in long-term care facilities and hospitals.
- The length of stay in an intensive care unit (with exposure to endemic strains) and health care manipulations, e.g. use of catheters, are associated with a risk of acquisition of ESBLs.