

**Extended Spectrum Beta Lactamases (ESBLs)  
and AmpC Beta Lactamases (AmpCs)**

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**This policy etc. covers:** (Please tick ✓ relevant box below)

Healthcare Standards (CORE)	C04a	Monitor	
Healthcare Standards (DEVELOPMENTAL)		Finance	
Service Development Strategy		Performance Management	
Local Delivery Plan		Business Planning	
Assurance Framework		Complaints	
<b>Other</b> (Please specify): Hygiene Code (Health Act 2006), NHSLA Risk Management Standards for Acute Trusts, 4.9			
Note: This policy has been assessed for any equality, diversity or human rights implications.			
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## **1. General Information**

ESBL and AmpC are enzymes produced by certain Gram negative bacteria that confer resistance to 3<sup>rd</sup> generation or “extended spectrum” cephalosporins e.g. ceftazidime and cefotaxime. They also confer resistance to penicillins and are often linked with resistance mechanisms to other classes of antimicrobials thus limiting the range of options available for their treatment. ESBL producing organisms were first described in the 1980s and first reported in the UK in 2000 affecting in *Klebsiella* spp; Gram negative / “coliform” organisms. Resistance is genetically encoded and may be passed from one species to another; even between species.

## **2. Identification of Infection**

Microbiology will annotate reports of all organisms found to carry the ESBL/AmpC resistance mechanism with a comment drawing attention to the isolate and its resistance mechanism. Antimicrobial treatment is not indicated unless the patient has a symptomatic infection.

## **3. Significance**

These resistance mechanisms affect the facultatively anaerobic Gram negative organisms (“coliforms”). These organisms are found in very high numbers colonizing the large intestine and are most commonly implicated in infections of the gastrointestinal, hepato-biliary and genitor-urinary systems. A minority of these infections will therefore involve strains that have these resistance mechanisms. The majority of ESBL and AmpC related infections are of the urinary tract. However, as the organisms concerned make up normal bowel flora carriage may be asymptomatic. Asymptomatic bacteriuria with these organisms is also seen and is especially common in the elderly; treatment is not indicated without signs or symptoms of infection.

## **4. Screening**

Stool screening for patients known to be carriers of ESBL or AmpC producing organisms is not necessary. Carriage is assumed to be prolonged.

## **5. Treatment**

Clinical judgement is required as to whether the ESBL or AmpC producing organism is causing infection. In many instances antibiotic therapy is not required. Where treatment is indicated, options may be limited. Advice can be obtained from the local duty medical microbiologist via 01392 (40)2977 or via switchboard out of hours.

## **6. Patient Risk Group**

Patients who are most at risk from infections due to ESBL and AmpC producing organism are those who are neutropenic, have undergone organ

transplantation, premature neonates and older persons. Others at risk include those who have received prolonged and extensive antibiotic therapy, those who have undergone gastrointestinal surgery and those with long term urinary catheters.

## **7. Transmission and Prevention**

These organisms are part of the faecal flora and as such are of particular relevance to urinary catheters and faecally contaminated items. Transmission occurs due to poor hand hygiene and contaminated fomites in the clinical setting. Hand hygiene is of paramount importance and alcohol hand gel is very effective against ESBL and AmpC producing organisms. Adherence to good infection control practice regarding urinary catheter care and personal hygiene are vital.

## **8. Infection Control Measures**

In the acute and PCT hospital setting and in other care areas where high risk inpatients groups are found, patients should ideally be isolated in a single room, but if this is not possible, spatial isolation within a bay should be implemented, taking all appropriate precautions. It is, however, important to avoid nursing other patients in high risk groups in the same area where possible (see above). This also includes patients who have indwelling urinary catheters as these increase the risk of urinary tract infection. The use of gloves and disposable aprons is recommended for direct contact and when dealing with urine and faeces.

## **9. Maintaining standards of care**

Infection control measures should not compromise the patient's care and should not affect the patient's freedom to be mobilised or attend other departments for healthcare-related visits.

## **10. Transferring of patients**

It is important to make the receiving clinical area aware that the patient has an ESBL or AmpC producing organism, with emphasis on the importance of good hand hygiene, catheter or urinary tract management.

## **11. Transportation by ambulance or car**

Patients with ESBL and AmpC carriage or infection can be transported with other patients in hospital cars and ambulances. Good infection control practice must be maintained.

## **12. Further Reading**

HPA. (2005). Investigations into multi-drug resistant ESBL producing Escherichia coli strains causing infections in England. Health Protection Agency.

Available at

**[http://www.hpa.org.uk/hpa/publications/esbl\\_report\\_05/2\\_intro.htm](http://www.hpa.org.uk/hpa/publications/esbl_report_05/2_intro.htm)**