

# Infection control lessons learnt due to cross infection with an extremely-drug resistant *Acinetobacter* in a modern intensive care unit

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## The Setting

- North Bristol NHS Trust (NBT) is a 1000 bed hospital with referral centres for neurosurgery, trauma and burns.
- It has a 4 ward, 48-bed intensive care unit (ICU) divided into 4 separate 12 bed pods with each bed in a single room. The unit was opened in 2016 as part of the new build hospital.
- In 2018 the first cross infection of an extremely resistant Gram negative organism between 2 inpatients occurred with an extremely drug resistant strain of *Acinetobacter baumannii* (XDR-AB) occurred. Patients were both in the ICU at the same time but had never been in the same 12 bed pod. This event was managed with immediate necessitating closure of both two intensive care unit (ICU) pending further investigations.
- All patients admitted to ICU are screened on admission and weekly thereafter for multi resistant gram negatives (the purpose of the screen is to identify any isolates resistant to 3 antibiotic classes out of quinolones, 3rd generation cephalosporins, aminoglycosides, and carbapenems; all ESBLs, and any Gram negatives resistant to meropenem).

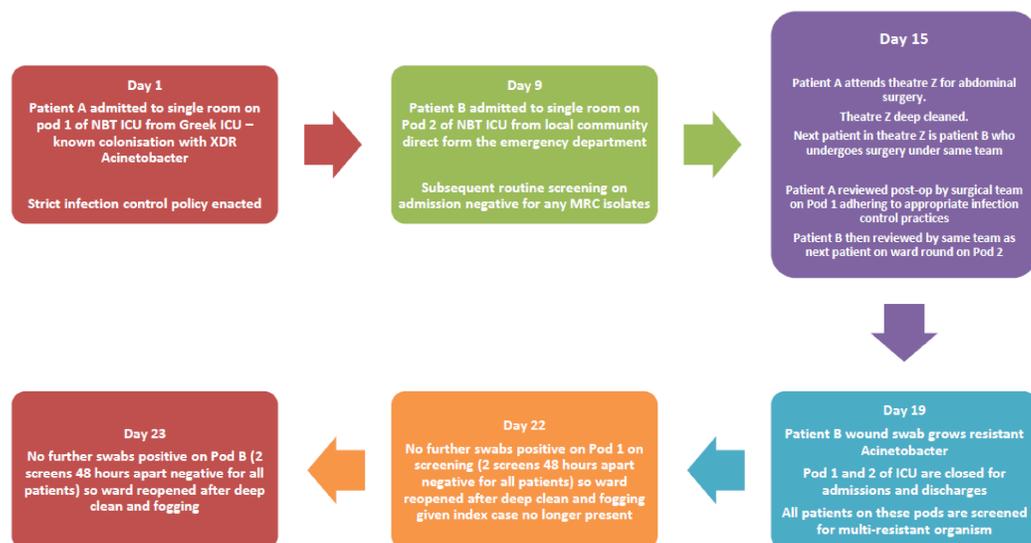
## Experience of Resistant Organisms

- Extremely resistant organisms are not endemic at NBT but multi resistant coliforms (MRC) are actively sought in at risk patients including the screening of all patients presenting to NBT following healthcare abroad and all patients on admission to ICU and weekly thereafter until discharge from ICU.
- MRC Screening is from all surface sites using MRSA screen swabs and also rectal screening specifically for carbapenemase-producing enterobacteriaceae.
- Previously there has been no case of cross infection of an extremely drug resistant Gram-negative organism between patients in NBT.

## What this poster tells you

- We describe the clinical setting and management of this outbreak.
- The subsequent reflections and clinical lessons learnt - from the perspective of the trust's medical microbiology and infection prevention and control teams.

## Timeline of Outbreak



## Organism Information

Resistant to all aminoglycosides, beta-lactams, quinolones, and colistin

Sensitivity testing performed using BSAC disc diffusion methods, Vitek2 automation, and for colistin – broth dilution. Isolate also sent to the reference laboratory at Colindale for confirmatory sensitivity testing for colistin.

Only tigecycline had a susceptible MIC of 0.5mg/L.

DNA sequencing confirmed the isolates from Patient A and B were identical.

Patient A was found to have the resistant organism in multiple screens from different sites prior to the cross infection incident. It was never isolated from any sterile site tested.

Patient B was found to have the resistant organism in multiple screens but also a central line tip, and one peripheral blood culture.

## Patient Outcomes

Patient A died on day 17 of admission from non-infective causes.

Patient B died on day 16 of admission from non-infective causes.

## Conclusions from the Outbreak Investigation

- No single breach of policy could be identified which was likely to have resulted in the cross infection.
- It was felt that the most likely source would have been around the time of the surgical procedures or subsequent review on the ICU by the surgical team.
- An in depth review of theatre cleaning procedures by the infection control team revealed that though staff understood the deep clean policy, there was some confusion about individual responsibilities for aspects of cleaning amongst theatre team members. This may have led to an incomplete deep clean.
- Further educational sessions were delivered to ensure all theatre staff understood their roles in the deep clean of theatre suites, followed by review of theatre environment to confirm cleaning was meeting standards required.

## Reflections

- This outbreak was an isolated and unexpected event.
- The hospital policy for managing patients with multi drug resistant organisms was still felt to be comprehensive and effective
- BUT a failure of understanding of all aspects of the policy may have lead to inadvertent breaches, with the potential to cause cross infection with an almost untreatable organism
- In a hospital where patients colonised with multi drug resistant organism are still uncommon, it is important to ensure all staff are aware of their respective roles when managing a patient colonised or infected with such organisms. There is a need to reemphasise important aspects of control measures, with additional educational sessions if needed, and assess application of the relevant policy this in practice at the time.