STANDARD 5
ACCESS TO DIAGNOSTICS

NHS England

SEVEN DAY SERVICES CASE STUDY

MAY 2015

Chesterfield Royal Hospital NHS Foundation Trust

Seven day blood culture services

AT A GLANCE:

- **Chesterfield Royal Hospital is introducing a 24 hour, seven day blood culture service. This aims to improve antimicrobial management, delivering better clinical outcomes and reduced length of stay.**
- **Many of the improvements will be achieved using existing resources through multidisciplinary working. No staff shift changes will be required.**
- **In many instances, organism identification and sensitivity results on positive blood cultures will be available at least 24 hours earlier.**
- **This process (in part or total) has the potential to be transferrable to most laboratories in the UK.**

GETTING STARTED

- Review data on current service performance'.
- Identify any training needs to deliver new ways of working.
- Engage staff in the process.

Blood culture testing is an essential investigation performed on some of the sickest patients. However, the service offered at weekends and out of hours is invariably less than that provided during normal working hours on week days, with significant inter-laboratory variation. This inequality of service leads to delays in rationalising antimicrobial therapy based on organism sensitivity results, impacting on patient safety, quality of care and length of stay. Chesterfield Royal Hospital's initiative aims to create a seamless blood culture service that operates 24 hours a day, seven days a week.

How the improvements were made

- Data was collected on the current state of services.
- Outcome measures were compiled on turnaround times for positive cultures and times for individual steps in the process.

- Engagement with both blood sciences and microbiology staff was carried out, using meaningful data and showing the impact on the patient journey.
- The blood culture analyser was moved from microbiology to blood sciences, which runs a 24-hour shift system.
- Blood sciences staff have been trained to load the blood culture analyser. The next step is to train them to remove positive bottles and perform a blind subculture outside routine hours. This will take less than ten minutes, and will provide the identity and sensitivity of the pathogen up to 24 hours earlier.
- The final step will be to train blood sciences staff to perform the equivalent of a Gram stain using nanosphere technology. The result will be communicated to the on-call clinicians who, with locally developed algorithms, should be able to manage most patients without having to contact the on-call microbiologist.
- Many of the project's improvements will be achieved without extra resources and with minimal extra training. Improvements were achieved by working differently within the existing establishment. No staff had to change their shifts.

What was achieved

Blood sciences staff are now loading the blood culture machine 24 hours a day, seven days a week. Training is about to commence for blood sciences staff to perform blind subcultures.

The hospital will soon move to the next stage of the programme, nanosphere technology, which enables staff to find out more about the organism in a positive blood culture with minimal extra training. This ensures the best possible care for all septic patients 24 hours a day.

All the changes will be reviewed to ensure sustainability. New standard operating procedures will be developed and there will be an ongoing audit.

What was the impact

The prompt loading of samples on to the blood culture machine should lead to:

- Earlier identification of positive blood cultures, permitting more rapid availability of pathogen identification and sensitivities.
- Issuing 'real time' 36 hour negative blood cultures to the neonatal unit. This permits early cessation of antibiotic therapy, prompt re-uniting of baby with mother and reduced staffing pressures.
- Earlier correction of inadequate or inappropriate antibiotic therapies.

Longer term the project is expected to result in:

- Improved clinical outcomes, including contributing to the national drive on sepsis, sepsis six, and reduced length of hospital stay.

- Improved antimicrobial management through quicker correction of inappropriate therapies or de-escalation of therapy to narrower spectrum and less costly treatment with lower risk of side effects.
- Cost savings and reduced pressure on clinical staff.
- The intervention is in keeping with national drives on seven day services, antimicrobial stewardship, improving outcomes from sepsis and multidisciplinary working.

TOP TIPS

- **Engage all relevant stakeholders at an early stage.**
- **Test out changes as a small trial so staff can see the outcomes and address their reservations.**
- **Ensure good quality, meaningful data and relevant outcomes are defined to demonstrate the benefits of seven day services.**
- **Embed the changes into standard operating procedures to ensure sustainability.**

Contact

Naomi Thompson, Consultant Microbiologist
naomithompson@nhs.net

Chris Ainger, Service Lead, Blood Sciences:
chris.ainger@nhs.net

Michael Weinbren, Consultant Microbiologist
mweinbren1@nhs.net