

For the record: annual audit as a tool to improve patient handover and the quality of microbiology reports

Introduction

- Microbiology at the Newcastle Hospitals (NUTH) provides 24/7 clinical advice for in-patients and outpatients at an 1800-bedded hospital on two main sites, and supports primary care in the area.
- NUTH is a tertiary referral centre providing a wide portfolio of clinical specialties, the patients are often very complex and different microbiologists including trainees may be involved in a patient's management at different times.
- Good inter-departmental handover is therefore essential. Written handovers are used to support out of hours working, supplemented by laboratory bench-rounds and clinical meetings.
- Medical microbiology notes added to the patient's laboratory results provide a permanent record, which can be accessed remotely. These have been encouraged until new integrated electronic patient record (EPR) and laboratory information system (LIMS) are procured.
- Blood cultures are among the most important microbiology results.
- We carried out annual snap-shot audits of the medical microbiology (MM) notes attached to positive blood culture records over the past three years.
- During this time, the laboratory changed from a single to a dual bottle blood culture system.

Figure 1: Automated blood culture system



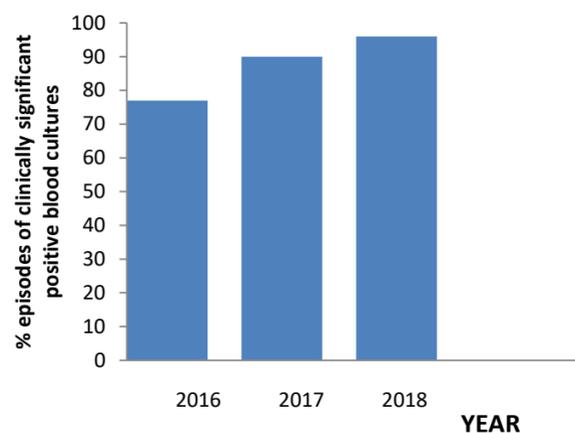
Methods

- Retrospective snap-shot audits of the use of MM notes on positive blood cultures were carried out every year from 2016-18.
- Audits covered the same two week period in June.
- The laboratory work book and computer system were analysed.
- Data collection included
 - number of positive blood cultures
 - presence of MM notes
 - Percentage patient episodes* with significant blood cultures with relevant MM note
 *Patient episodes were defined as all positive blood cultures collected within 48 hours of the first positive blood culture.
- Following each annual audit, results were fed back to the medical microbiology team.
- Interventions were made to improve compliance:
 - Presentation of results and discussion at audit meetings
 - strengthened induction for new staff
 - authorisation training for trainees
 - revision of the departmental authorisation manual.

- The scope of the audit was extended in 2018 to provide some assessment of the quality of microbiology reports:
 - presence of interpretative comments for probable contaminants
 - reporting of appropriate antibiotic sensitivities
- In December 2017, the Trust changed from a single to a dual bottle (aerobic and anaerobic) blood culture system, except for paediatric patients where a single aerobic bottle was retained.

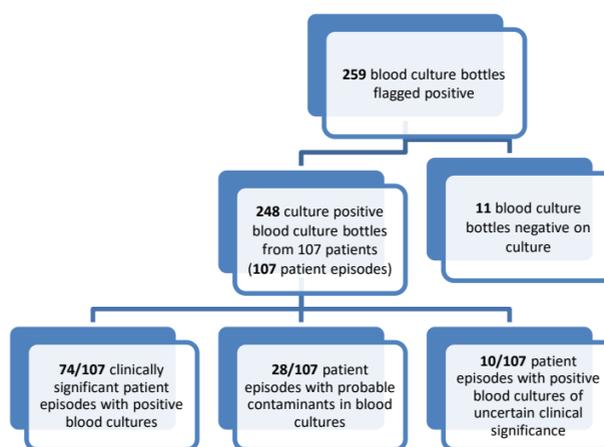
Results

Figure 2: Presence of Medical Microbiology notes



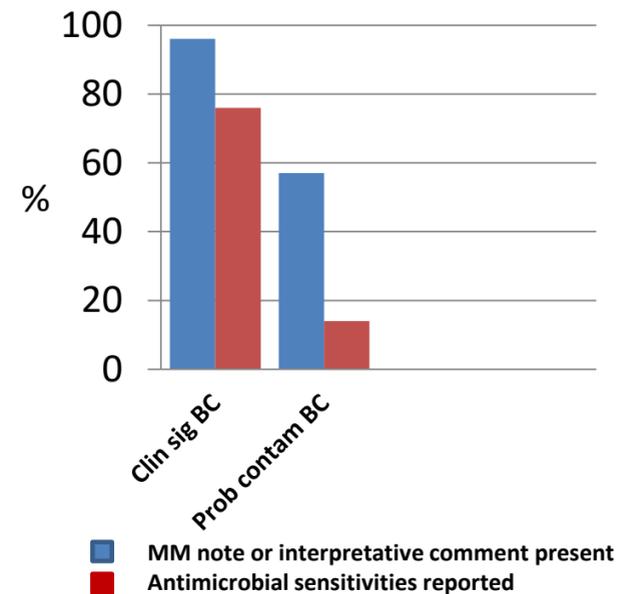
- Use of MM notes in patient episodes with clinically significant positive blood cultures increased year on year from 77% in 2016 to 96% in 2018. (figure 2)

Figure 3: Breakdown of positive blood cultures during two week audit, June 2018



- 2018 audit** (figures 3 and 4)
 - 74 clinically significant patient episodes with positive blood cultures ('Clin sig BC')
 - 28 patient episodes where positive blood cultures were likely to represent contamination ('Prob contam BC')
 - For clinically significant patient episodes, 96% had a MM note and appropriate antimicrobial sensitivities were reported in 76%
 - For blood cultures unlikely to be clinically significant, interpretative comments highlighting the likelihood of contamination were present in only 57%, and antimicrobial sensitivities were reported in 14%.
- Introduction of a dual blood culture system** lead to
 - Increased number of positive blood cultures from 110 in 2017 to 248 in 2018 audit period
 - Increased number of patient episodes with clinically significant positive blood cultures from 59 in 2017 to 74 in 2018.

Figure 4: Assessment of quality of blood culture reports during 2 week audit, June 2018



Discussion

- The complicated and vulnerable patient groups at NUTH mandate reliable recording and handover of patient management within the microbiology team.
- As a Global Digital Exemplar, NUTH is moving towards a 'paperlite' system, but the current LIMS has only a limited facility for medical notation, which is not interfaced with the existing EPR. Pending full integration of these systems, MM notes are used as a record for important clinical specimens such as positive blood cultures, providing a source of clinical notes accessible to microbiologists on site or remotely.
- Clinical audit is used to improve standards of patient care by evaluation of practice against established standards. Where no standards exist, alternative approaches include the use of quality improvement (QI) methods or a Plan Do Study Act (PDSA) cycle.¹
- Annual snap-shot audits of positive blood culture laboratory reports helped to increase compliance with the use of MM notes over three years, from 77-96%.
- Although it is our practice to liaise with clinicians directly about significant microbiology results and record results in the medical notes, it is also essential to produce high quality laboratory reports.
- We now intend to use the QI process to improve the quality of microbiology reports, leading into the introduction of new 'paperlite' systems of working.
- Two basic markers of quality were assessed during the 2018 audit: reporting of appropriate antimicrobial sensitivities for clinically significant blood cultures and whether sensitivities were withheld and an interpretative comment added highlighting the possibility of contamination in blood cultures which were unlikely to be significant.
- Further work is required to improve our reports. We plan to survey clinicians for their views about their quality and utility to inform this development.

Conclusion

- Annual snapshot audit helped improve the use of medical microbiology notes for significant positive blood cultures from 77% in 2016 to 96% in 2018.
- We now intend to use the PDSA cycle to improve the quality of our laboratory reports in preparation for 'paperlite' working.