availability of MRSA results within two hours of specimen reception facilitates more rapid isolation of MRSA-positive patients.
Methods: The study was carried out in a 700-bed tertiary-referral hospital over a 10-week period from October to December 2008.
Patients (n = 319) at risk for carriage of MRSA were investigated. Specimens (n = 704) were collected from nasal and groin sites using Copan double swabs in Stuart's liquid transport medium. One swab was processed by Xpert MRSA; the second was inoculated onto MRSA-Select chromogenic agar (CA) (Bio-Rad) and retained to investigate discrepancies between PCR and culture results. CA plates were incubated for 24 h at 37ºC. Discrepancies were investigated by culturing the second swab in salt enrichment with subculture onto blood agar and CA. Xpert MRSA assay results were compared with results of direct and enrichment culture and also on an amended basis where kit-positive culture-negative specimens were considered true positive results if patients had previously been MRSA-positive or had positive samples from another site.
All Xpert MRSA results were reported to the Infection Control Team twice daily but positive results were communicated immediately. Data were collected on the isolation parameters of patients.
Results: One-hundred and fourteen specimens were positive by the Xpert MRSA assay and 59 were positive by culture. Sensitivity, specificity, positive and negative predictive values of the Xpert MRSA assay were 95%, 97%, 82% and 99%, respectively, compared with amended results. Five specimens were kit-negative and MRSA culture-positive while 21 specimens were kit-positive and MRSA culture-negative. Six of these samples were confirmed to be false-positives.
Seventy-six patients (24%; 76/319) were positive by PCR. On assessment of the impact of these rapid results: six were discharged from hospital and 19 were already isolated/cohorted before results were reported while 51 were isolated/cohorted following the positive result. Seventy percent (36/51) were isolated within 8 hours of specimen result which is up to 48 hours earlier than occurs with routine culture results.
Conclusions: Rapid screening using the Xpert MRSA assay greatly facilitated earlier isolation of MRSA-positive patients and combined with good diagnostic accuracy can contribute to improved MRSA control.

P1558 Evaluation of commercially available molecular and culture-based assays for rapid detection of methicillin-resistant *Staphylococcus aureus*

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Background: The need for rapid methods to accurately detect methicillin-resistant *Staphylococcus aureus* (MRSA) is widely acknowledged. We assessed 3 commercial assays – 2 molecular, GeneOhm (BD Diagnostics) and GeneXpert (Cepheid) – and 1 culture-based, Baclite (3M) – for their ability to correctly identify MRSA utilising well-characterised isolates, either pure or in mixtures, at varying concentrations.
Methods: Fifty-two isolates (27 MRSA of which 9 were animal strains; 25 non-MRSA of which 8 were MRCoNS, 5 MSSA, and 12 enterococci, Enterobacteriaceae and *Acinetobacter* spp.), and 21 mixtures of these isolates were tested on the three assays following manufacturer's recommendations. As pure strains, non-MRSA were tested at 1 dilution (10^5 CFU/ml for GeneOhm and GeneXpert, and 10^8 CFU/ml for Baclite according to manufacturer's instructions), while serial dilutions (10^1 to 10^3 or 10^4 CFU/ml) of the 27 MRSA strains were tested to determine the limit of detection (LoD) of each assay. Mixtures were made using isolates at varying concentrations according to CLSI guidelines. Moreover, 10 µl of each sample was also simultaneously spiral-plated on blood agar with 6 µg/ml cefoxitin and in case of MRSA positive samples, colony counts were made after overnight incubation. Mean sensitivity and specificity and confidence intervals (CIs) were estimated for each assay by logistic regression model using a penalised likelihood approach.
Results: GeneOhm showed the highest sensitivities for both isolates and mixtures at lower (10^3 CFU/ml) concentrations (Table).

Table. Performance of three commercial assays for rapid detection of MRSA

Assay	Mean sensitivity (95% CI) at MRSA concentration		Mean specificity (95% CI)	Minimum limit of detection
	10^3 CFU/ml	10^4 CFU/ml		(CFU/ml)
Using isolates as samples				
GEneOhm™ MRSA (BD Diagnostics, BE)	93.7% (80.2–98.2)	ND*	77.2% (60.0–88.5)	140
GeneXpert™ MRSA (Cepheid, FR)	86.8% (75.2–93.5)	99.5% (97.9–99.9)	82.3% (55.2–94.6)	140
Baclite™ MRSA (3M, USA)	40.1% (26.1–55.9)	93.8% (86.7–97.2)	98.2% (90.5–99.7)	410
Using mixtures as samples				
GEneOhm™ MRSA (BD Diagnostics, BE)	97.6% (90.6–99.4)	ND**	55.6% (31.9–77.1)	44
GeneXpert™ MRSA (Cepheid, FR)	94.8% (88.3–97.8)	99.8% (99.2–100)	63.2% (38.7–82.4)	27
Baclite™ MRSA (3M, USA)	26.9% (14.8–43.8)	89.3% (77.7–95.2)	95.3% (81.7–98.9)	2400

*ND, Not determined. Only samples negative at the lower concentration (n = 2) were tested at this concentration.
**Not determined as all MRSA-positive mixtures were detected at the lower concentration.

Of the 27 MRSA tested, 2 strains that could not be detected at 10^3 CFU/ml were positive at 10^4 CFU/ml, giving a 100% positivity for GeneOhm at the latter concentration. Mean sensitivity for GeneXpert was ⩾100% at 10^4 CFU/ml with narrow CIs indicating high precision of this parameter estimate. Baclite showed the highest mean specificities for both mixtures and isolates. False-positive results with the 2 molecular tests were primarily due to MRCoNS. Minimum LoD for both molecular assays was similar for isolates, while GeneXpert could detect upto 27 CFU/ml of MRSA in mixtures.
Conclusions: A general increase in mean sensitivities of all three assays was observed with increasing MRSA concentrations. GeneOhm and GeneXpert showed comparable performance in terms of sensitivity, specificity and LoD.

P1559 Clinical evaluation of four molecular methicillin-resistant *Staphylococcus aureus* tests: Becton Dickinson GeneOhm, Hain GenoType MRSA Direct and two in-house assays

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Objective: Methicillin-resistant *Staphylococcus aureus* (MRSA) has become an increasing problem in nosocomial infection. Rapid detection of MRSA-colonised patients is a prerequisite to limit spread of the organism in hospitals. Several molecular assays to quickly identify MRSA are available. The performance of such assays depends on many factors among which sensitivity and specificity of the assay. Besides, the incidence and type of MRSA strains that are locally present (foreign influence, presence of animal farms) influence positive and negative predictive values.
Methods: We evaluated the performance of four molecular methods on an ABI 7500 platform (BD GeneOhm MRSA real-time PCR assay, Hain GenoType MRSA direct and two in house real time PCR assays), using samples from 226 patients. In house PCR-1 was based on the detection of a *S. aureus* specific gene together with the MecA gene, in house PCR-2 was an MRSA direct PCR adapted from Huletsky. A minimum of two samples (each containing swabs from nose, throat and perineum) were analysed per patient. Before amplification, samples were enriched by overnight incubation in Tryptose Phosphate Broth with aztreonam. After overnight incubation CHROMagar MRSA and blood agar plates were inoculated. The outcome of the cultures after 2 days was considered gold standard.
Results: Twenty-three of the 226 patients carried MRSA. The sensitivities of the BD GeneOhm, Hain MRSA direct and in house PCR-1 and -2 were 95.7%, 95.6%, 69.9% and 87% respectively. The positive predictive values were 62.9%, 59.5%, 25%, and 33.3% and the negative predictive values were 99.5%, 99.5%, 95.3% and 98.2% respectively. The MRSA that were missed after overnight culture were retested as pure cultures. One MRSA strain remained negative in both the BD and Hain test, none were negative in PCR-1 and PCR-2.
Conclusions: We conclude that in our geographical region both the BD GeneOhm MRSA test and the Hain MRSA direct test displayed excellent