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Methods: 284 consecutive stool samples submitted to the Southern General Hospital diagnostic laboratory were tested by EIA and a combined toxin A/B and GDH kit. Discrepant samples were transferred to Glasgow Royal Infirmary for cell-culture cytotoxicity testing. All stool specimens with discrepant results were cultured for *C. difficile*. All isolates were subcultured overnight in Robertson's Cooked Meat broth and the supernatants tested by EIA, combined toxin A/B and GDH card-based detection kit and cell-culture cytotoxicity.
Results: An initial 2-step diagnostic algorithm, based on GDH and EIA testing allowed accurate reporting of 91% of results on the day of specimen receipt. After 2 days 96% of results were available, and the remaining 4% by the end of day 3. Off-site cell-culture cytotoxicity testing was not helpful in resolving discrepant results, whereas on-site toxigenic culture resolved all discrepant results.
Conclusion: The application of this testing protocol allowed reporting of the majority of CDI tests within 24 hours, utilising existing technology widely available in diagnostic laboratories.

P21.08
Novel applications of ATP bioluminescence for specific rapid microbial detection

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Background: ATP bioluminescence technology is well established with 30 years of proven use in several industries. Its primary application has been rapid, direct, objective assessment of cleanliness and hygiene viz a non-specific determination of organic residues. For this application it has received Category 1 recommendation by Health Protection Agency, Rapid Review Panel. Elsewhere, ATP bioluminescence has been used successfully as a non-specific monitor of biomass in a variety of foods, cosmetics, pharmaceutical products.
Obectives were to engineer the biochemistry to enable the detection of specific bacteria and determine limits of detection.
Methods included the re-formyulation of the biochemistry of the luciferase reaction with specific substrates to facilitate the detect specific bacteria and retain its exquisite sensitivity and speed of result. The effect of time, temperature, and substrate specificity was determined.
Results show that the novel bioluminogenic tests will detect low numbers of specific bacteria in 4–7 hours including Enterobacteriaceae, *E. coli*, and other organisms such as Extended Spectrum Betalactmase (ESBL) organisms, and *Staphylococcus aureus* (both methicilin resistant and sensitive strains). The construction of this new bioluminogenic assay utilises traditional diagnostic characteristics which confers a high degree of specificity and sensitivity compared to traditional methods. The technique is robust because there is no interference from background ATP in the sample. Similarly the early and sensitive detection eliminates the interference for other competing microbes that often cause a problem in traditional cultural microbiological methods.
Conclusion: The new bioluminogenic assay provides a simple rapid screening tool for specific bacteria and in combination with novel sensitive portable instrumentation, this technology has the potential to provide new products suitable for point of care testing.

Poster Session 22 – Operating Theatres

P22.01
Validity of preventive measures against needlestick injuries in the operating theatre

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Background and Aims: Our hospital is a 476-bed emergency hospital in the heart of the Tokyo metropolitan area, providing primary, secondary and tertiary emergency services. Total reports of needlestick injuries between 2002 and 2005 were 131. Particularly the number of cases in the operating theatre was 41; the rate was rather high (31%). We needed to prepare a scheme to prevent needlestick injuries in the operating theatre.
Methods: We asked the working committee of operating theatre to draft preventive measures in 2005. After investigation by task force, new preventive measures were settled on. Measures consist of appropriate use of protective devices and blunt-tip needles, so-called 'hands-free' methods at delivery of instruments, and so on. We examined from reports between 2006 and 2009 and compared four years each before and after the implementation to evaluate their validity.
Results: Total reports between 2006 and 2009 were 129. The number of cases in the operating theatre was 29; the rate was significantly decreased to 22%. Analyzing the contents, cases at intraoperative management were decreased from 22 to 13 and cases at delivery of instruments were decreased from 9 to 4. In contrast cases at disposal were slightly increased from 5 to 8. The rates of HCV positive injuries are almost similar; 10% (4/40) and 14% (4/29).
Conclusions: Our preventive measures against needlestick injuries in the operating theatre proved to be valid for decreasing cases at intraoperative management and at delivery of instrument. We need further measures to protect injuries at disposal. Standard precautions are not enough for protecting occupational injuries in the operating theatre but advanced precautions should be investigated.

P22.02
Estimating operating room ventilation system performance in realistic scenarios

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Background: Results of large-scale studies of surgical site infections have been subdivided in mixing and laminar flow systems. Some studies indicate that the influence of the type of system is negligible, others indicate a positive influence. Recent engineering studies show a large difference in performance between various laminar flow systems where the performance of the ventilation system is defined as the ability to remove airborne pollutants from the wound area and the instrument tables.
Objective: In this investigation a new method is tested that can be used to estimate the performance of an OR ventilation system.
Methods: The tests are performed in two separate hospitals. During an operation, the use of the operating room is observed. The location of operating table, instrument tables, equipment and people in the room is recorded, as well as the temperature of objects using a thermal imaging camera. The ventilation rate is measured before the operation is started. Afterwards, computer simulations of the airflow are made using measured ventilation rates and observed table arrangements as boundary conditions. The performance is estimated using the spread of particles in the simulation.
Results: In hospital 1 the operating table and instrument tables are well shielded from particle sources in the periphery. Contaminants from sources inside the operating area were not removed efficiently from the wound area. In hospital 2 the wound and the instrument tables were also well shielded from sources in the periphery, but here, contaminants produced in the operating area are removed 4.7 times more effectively.
Conclusions: The performance of ventilation systems differs according to the ventilation system design and way the room is used. The method estimates the performance of the ventilation system in a realistic situation. Including the estimated performance in a statistical analysis together with the surgical site infection incidence could improve correlation.