Quasi-randomised trial of silicone-based and silver-coated Foley catheters for the prevention of catheter-related complications in Japan

Device-associated infection surveillance project by the Japanese Society for Infection Prevention and Control. Data summary for 4 years.

Modified urinary catheters with controlled release of antimicrobials agent to prevent biofilm-associated UTIs in an experimental murine model.

Device-associated infection surveillance at a District General Hospital – Embedding best practice so that no person is harmed by a preventable infection.

Device-associated infection surveillance in an acute hospital in a low-risk region.

Infection control in care homes – A proactive approach.

Creating awareness and improving the uptake of an e-learning tool in a neonatal intensive care unit.

The Big Move – A hospital move from an infection prevention and control viewpoint.

A systematic literature review on the core components for national infection prevention and control programmes.

Infection control and cancer: A perfect storm.

A feasibility study.

Improving the uptake of sharps and waste management training among doctors.

Infection control and cancer: A perfect storm.

A systematic review of the evidence.

Using a multimodal intervention incorporating audit and targeted feedback to improve hand hygiene compliance and reduce surgical site infections. A quasi-experimental retrospective before and after study design.

Device-associated infection surveillance at a District General Hospital.

Exploring the “Urgh Factor”: To what extent can behavioural theory (inherent/elective) contribute to improving processes of hand hygiene measurement and education? Results from Phase 1.
Oral presentations

Abstract ID: 4444
Outbreak of Panton-Valentine Leucocidin-associated *Staphylococcus aureus* (PVL-SA) skin infection linked to a diving club at a national sports centre: Case management, environmental assessment and control measures
Elizabeth Marchant¹, Ms Jean Bywater², Ms Esther Dias³, Professor Keith Neal¹, Ms Jane de Burgh¹, Ms Louise Bishop¹, Dr Albert Mifsud¹, Dr Andrew Mackay³, Professor Angela Kearns¹, Dr Rebecca Cordery¹
¹Public Health England, ²London Borough of Bromley, ³King’s College London NHS Foundation Trust

Introduction
Routine follow-up of a teenage child with a microbiologically confirmed Panton-Valentine Leucocidin-associated *Staphylococcus aureus* (PVL-SA) skin infection in January 2015 showed the child was a diver and that other children in the competitive club had had similar infections. The club confirmed that 5–10 children and a coach had been affected; at least two children remained symptomatic and the latest case was a new onset, suggesting ongoing transmission.

Methods
Information was sent to all parents of children attending the diving school. A site visit was undertaken and an online questionnaire was sent to all parents to allow case finding and to further elucidate risk factors for acquisition and transmission.

Results and discussion
Three confirmed cases (all spa type t034 PVL-MSSA), two probable and five possible cases, all with soft-tissue infection were identified in this outbreak. All confirmed and probable cases had onset in spring 2014 except one, with onset in January 2015. Ninety-nine questionnaires were completed (269 clients were emailed). Whilst numbers of cases were too small to allow multivariable analysis, several likely routes of transmission were identified:

- Sharing of shammy (diving) towels
- Piling shammy towels at poolside
- Infrequent washing of shammy towels
- Shared equipment, e.g. harness in dry gym, with no cleaning between use

Control measures centred on reducing spread of infection by improving cleaning in the dry gym and at poolside. Further infection control measures focussed on education around washing and personalisation of shammy towels. Outcomes of the investigation were shared with the pool management team and diving club with a view to wider dissemination at national competitions.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4474
Exploring nurse independent prescribers’ beliefs about prescribing antimicrobials for upper respiratory tract infections
Valerie Ness, Dr Lesley Price, Professor Kay Currie, Professor Jackie Reilly
Glasgow Caledonian University

Introduction
Antimicrobial resistance (AMR) is an urgent public health concern. Resistance can be accelerated with the imprudent use of antibiotics. Previous research suggests that inappropriate prescribing is apparent in practice; however, much of this has focused on doctors. With a growing number of nurses potentially prescribing antimicrobials, their practice is of particular concern.

Methods
The Reasoned Action Approach (RAA) model proposes that behavioural (advantages/disadvantages of carrying out the behaviour), normative (individual or groups who would approve/disapprove; likely/unlikely to carry out this behaviour) and control beliefs (enablers or inhibitors to carrying out the behaviour) are the psychological foundation for human behaviour. In order to assess the beliefs of nurse prescribers, one-to-one, open-ended telephone interviews were carried out using the RAA model’s guidance. Interviews were recorded and content analysed to identify the population’s modal (most frequently occurring) salient (accessible) beliefs.

Results
Twenty-seven nurse independent prescribers (NIPs), from a variety of settings across Scotland, were interviewed. The most frequently occurring advantage for managing patients presenting with upper respiratory tract infections without prescribing an antibiotic was the prevention of AMR (n=21, 78%), the disadvantage was stress from patient pressure/expectation (n=11, 41%). Other NIPs were most frequently mentioned as being most likely to manage patients without prescribing (n=11, 41%), with GPs least likely (n=16, 60%). Finally, having the time to educate/reassure/advise the patient was the most frequently mentioned enabler (n=24, 89%) and patient pressure was the greatest inhibitor (n=18, 67%).

Discussion
Some of these findings are similar to those found in the literature; however, many others have emerged – one of the main categories being patient expectation and the challenges this creates when trying to manage patients without prescribing an antibiotic. This elicitation work has therefore identified the salient beliefs for this population and will be used to develop a national questionnaire.

Declaration of interest
I do not have any conflict of interests to declare.
Abstract ID: 4549

Attitudes of student nurses to the use of non-sterile clinical gloves

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Introduction
Recent studies suggest non-sterile clinical gloves (NSCG) are used for a wide range of care activities not involving contact with blood and body fluid (BBF). Their use has been associated with cross-contamination because they are put on too early, removed too late and transfer pathogens to susceptible sites, other surfaces and patients. Understanding influences on healthcare workers’ attitudes to glove use is important for changing glove-use behaviour. This study investigated student nurses’ attitudes to using gloves.

Methods
A cohort of 3rd year student nurses completed a questionnaire to indicate which of 46 clinical tasks they would routinely wear NSCG for and influences on their decision. They had no prior information about the use of NSCG except as part of their normal training. Exploratory factor analysis was used to identify correlations in reported NSCG use.

Results
All 67 students completed the questionnaire. Almost all would routinely wear NSCG for tasks involving contact with BBF. However, some reported behaviour was inconsistent: a higher proportion would wear gloves for washing an adult (88.1%) than a baby (25.4%) and for changing an incontinence pad (98.5%) than a nappy (61.2%). More than 40% of respondents indicated they would routinely wear NSCG for tasks where they would not be necessary, for example giving IM/SC injection (76%) or taking MRSA swabs (79%). Correlation between tasks could be summarised under four factors: probable contact with BBF; definitive indication; “just in case”; and personal hygiene. 94% of respondents cited their own judgement as a key influence on their glove use.

Discussion
This study has demonstrated that student nurses’ rationale for using NSCG is not always based on accurate assessment of risk of exposure to BBF. Their decision to wear gloves is perceived to be personal, and suggesting improvement strategies which rely on encouraging challenge by peers or education may not be effective.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4589

Development of national guidance for the decontamination of semi-invasive ultrasound probes

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Introduction
Semi-invasive ultrasound probes (SIUPs) are a cornerstone in the diagnosis and treatment of patients; however, infection control concerns exist over the use of probes and their role as a vector for pathogen transmission. No guidance was available within NHS Scotland, and a number of health boards over recent years have requested expert advice on the use of and decontamination of SIUPs.

Methods
Health Facilities Scotland (HFS) conducted a national survey of transoesophageal (TOE), transvaginal (TV) and transrectal (TR) ultrasound probes to identify current decontamination practice across NHS Scotland. A scientific literature review was undertaken by HPS regarding the effectiveness of the decontamination of SIUPs, including a review of manufacturers’ guidance.

Discussion
The literature review found limited evidence upon which to make recommendations on universal high level disinfection (HLD) methods of decontaminating SIUPs. Review of manufacturer instructions highlights variation in decontamination instructions and lack of material compatibility of different makes and models of SIUPs. HPS and HFS worked together to produce the Scottish National Guidance for Decontamination of Semi-Critical Ultrasound Probes; Semi-invasive and Non-invasive Ultrasound Probes. The guidance was developed using a wide consultative method and included some health boards trialling the three decontamination systems covered within the literature review. Where evidence was lacking to inform the guidance, expert opinion was sought from the reusable medical devices expert advisory steering group, which consists of national decontamination and infection-prevention experts.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4592

Establishing caesarean section surveillance as a patient safety initiative – A Trust’s success story

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Guy’s & St Thomas’ NHS Foundation Trust

Improvement issue and context
Surgical site infections (SSI) cause significant morbidity following caesarean sections (CS). CS surveillance commenced at Guy’s & St Thomas’ NHS Foundation Trust in 2010. An initial data validation took place in 2013, followed by a series of improvement initiatives which included a CS guideline and care plan both reflecting NICE recommendations, asepsis principles awareness for midwives and introduction of an Aquacel dressing left in situ for 5 days in 2015.

Methods and measurement
Data was collected using surveillance forms during inpatient stay and post discharge by community midwives up to 10 days. Patient postal questionnaires and telephone surveys were also used for post-discharge SSI data collection. Patient feedback was collected on general post-operative experience and experience with the new dressing.

Evidence of improvement
We have demonstrated a reduction in our SSI rates from 13.3% in 2013 to 6.8% in 2015 through various interventions targeted at improving patient outcomes. We used patient feedback to improve patient experience and developed patient information leaflets to empower patients. Feedback from the dressing evaluation suggested that dressings were painful at removal, and when additional staff support was provided patients’ experience with the dressing improved, highlighting the power of utilising patient feedback to improve patient safety and experience. The telephone survey was found to be a powerful method for detecting SSIs post discharge as it captured at least 40% of the infections. More than 80% of the infections were detected post discharge with a mean day to SSI presentation of 13 days. Our data was reproducible for the two validated quarters in 2013 and 2015, respectively.

Future steps
We are very confident that our surveillance systems sufficiently capture all cases of CS-SSI and will continue to validate our data at least one quarter annually. We will also continue to explore other strategies to further reduce SSI incidence.

Declaration of interest
I do not have any conflict of interests to declare.
Abstract ID: 4609

Reducing naughty CAUTI
Carole Hallam, Maggie Shepley
Calderdale and Huddersfield NHS Foundation Trust

Improvement issue and context
Urinary tract infections (UTIs) are the single largest cause of healthcare-associated infections (HCAI) and account for approximately 19% of all HCAI. The presence of a urinary catheter and duration of insertion are contributing factors to the development of a UTI. The project aim was to reduce the number of indwelling urinary catheters and their associated risks by improving patient assessment in patients with urinary retention, offering intermittent catheterisation (IC) as the first-line management option rather than the current practice of indwelling catheters. The project was also to improve the management of those patients requiring indwelling catheters.

Methods and measurement
The improvement work was led by a project nurse to provide training and education associated with IC to ward staff, development of a bladder management protocol and revision of care plans. Data was collected on the number of patients with indwelling catheters on the project wards: the Stroke Unit; medical wards; trauma and elective orthopaedics. In addition, data was collected on the completion of documentation which included an evidence-based bundle for both insertion and ongoing catheter management.

Evidence of improvement
The project has seen a significant reduction in patients with indwelling catheters from a monthly average of 60 to 40 per month. Cost savings were also noted in consumables estimated at £12,000 per year. A number of positive patient stories have been collected along with positive feedback from healthcare professionals.

Future steps
IC is now embedded into the training programme and a number of ward-based champions will ensure the sustainability of the change in practice. The work will be extended to all wards in the acute trust. In addition, the use of IC in failed “trial without catheter” patients in the community could provide a welcome alternative for some patients.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4635

A randomised controlled trial to compare medical-grade honey with mupirocin for MRSA decolonisation
Toney Thomas¹,³, Dr Georgina Gethin², Dr Deirdre Hughes-Fitzgerald³, Professor Hilary Humphreys³
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Introduction
Mupirocin is an important component in MRSA control specifically for nasal decolonisation, but resistance limits its use. Medical-grade honey (MGH) is used for the treatment of burns and infected wounds. The antimicrobial activity of natural honey may offer potential in MRSA eradication. We report the results of a randomised controlled trial (RCT) on nasal decolonisation of MRSA.

Aim
The purpose of this research was to compare the efficacy of MGH to mupirocin 2% to eradicate nasal MRSA.

Methods
Consenting MRSA-colonised patients were recruited and MGH 30% or mupirocin 2% was applied intra-nasally. Up to two courses of either treatment, three times a day for 5 days, was administered. Three consecutive negative MRSA screening results confirmed successful decolonisation.

Results
The mean age of the study participants was 73.2 years and 36% were female. Of the 100 study participants, 93% were previously known MRSA cases, 89% had a history of attempted decolonisation with 34% receiving two or more courses of nasal mupirocin, 43% had concomitant multi-drug-resistant bacteria colonisation and 68% non-nasal site MRSA carriage. In total 57% (57) were isolated either in a single room or were cohorted with contact precautions. Of the 86 participants who completed the study protocol, 36% (31) in the intervention group and 50% (25) in the control group were decolonised ($p=0.196$, $\chi^2=1.675$) in an intention-to-treat analysis. The success rate for MGH and mupirocin was 43% and 57%, respectively, according to the protocol analysis. In total, 14% (14) participants were lost on follow-up, withdrawn or deviated from the allocated protocol.

Discussion
The results from this first RCT of its type confirm the potential of MGH. However, further work is required to confirm the findings and optimise the concentration of MGH.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4638

Decreased bacterial contamination of dental unit waterlines with the introduction of reverse osmosis water
Emma Best¹, Sharon Kelly¹, Dr Kavita Sethi¹, Peter Parnell¹, Paul Verity²
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Improvement issue and context
Dental unit waterline (DUWL) systems are used to irrigate the oral cavity during treatment. These waterlines can become heavily contaminated with bacteria, leading to microbial biofilm formation despite decontamination and regular flushing. Leeds Dental Institute (LDI) uses a continuous dosing with 1% Alpron to achieve the water quality; however, we experienced repeated microbiological testing failures with the currently used Alpron system for water decontamination. A trial was instigated to investigate the contamination level and prevalence of bacteria in DUWL output water following the addition of reverse osmosis (RO) water instead of tap water. RO water has been purified by a process of diffusion and by applying an external pressure to reverse the natural solvent flow through a semi-permeable membrane.

Methods and measurement
RO water was added in four different dental chairs in LDI over a period of 18 weeks. Weekly microbiological testing of the water was carried out during this period, where a total of 72 water samples were collected from four different dental chairs and the bacteria (CFU/ml) were enumerated.

Evidence of improvement
Over the 18-week period the introduction of RO water showed a reduction in the levels of bacteria in all four dental chairs when compared with the bacte-rial levels at baseline when Alpron and tap water were used. Mean results for all four dental chairs at baseline (before introduction of RO water) was $7.7\times10^3$ CFU/ml compared with a mean count of $3.2\times10^2$ CFU/ml with the RO water.

Future steps
In this 18-week trial the introduction of RO water reduced bacterial counts in the routine water testing of four dental chairs. As a result of this, we intend to introduce the use of RO into all dental chairs within the dental institute, to provide consistent water quality for our patients and staff.

Declaration of interest
I do not have any conflict of interests to declare.
Abstract ID: 4652
The importance of room set-up (staging) on efficacy of UVC whole-room disinfection in a single side-room with en-suite
Angela Beal, Karren Stanforth, Natalie Vaughan
Nottingham University Hospitals NHS Trust

Introduction
A variety of whole-room disinfection units are available, which use the bactericidal effects of ultraviolet radiation (100nm–280nm for UVC). These are most effective in direct line of sight. Shadowing (created by furniture, etc.) can inhibit disinfection using these systems. This project examines the effects of room set-up (staging) on the efficacy of UVC whole-room disinfection.

Method
UV indicator cards were placed in a cleaned side-room, with en-suite (11 sites including line of sight and partial shadow). UVC was deployed at three locations using a 10 minute cycle time form each. Device and furnishings were re-staged prior to each deployment, in accordance with a protocol which was designed to maximise exposure of all surfaces by managing or eliminating shadowing. Indicator cards were used to visualise the UV exposure, after each deployment, providing a semi-qualitative measure of total UV light and correlating this to MRSA and Clostridium difficile kill (bactericidal and sporicidal activity).

Results
Where card location or positioning of the equipment did not allow line of sight to the UVC device, the colour change was less intense and took more cycles to reach the level indicated for MRSA or C. difficile kill. This confirms that positioning of equipment is key to the success of UV light in room decontamination. With three 10-minute deployments and careful attention to staging, it is possible to achieve bactericidal (MRSA kill) or C. difficile (sporicidal) exposure at all of the sites tested.

Conclusion
The indicator cards provide a rapid means of verifying UV exposure, and are a useful means of verifying the staging procedure employed prior to UV-C deployment. All cards changed colour but were affected by shadows and placing of equipment. This demonstrates the need to verify and optimise staging prior to UVC deployment in any new environment.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4662
A student-led investigation: Hand-washing in a primary school setting
Dona Foster1, Dr Christopher Flaherty2, Jo Eagle1, Edoardo Benali1, Isabelle Bonnie1, Harry Creak2, Oscar Firth2, Harry Foster2, Harriet Goddard2, Charlie Hodges2, Lydia Johnson2, Will Matthews2, Ellie McBride2, Louis Sharpe-Wood2, Tom Smith2, Professor Derrick Crook2
1IPS, 2Cokethorpe School, 3University of Oxford

Introduction
Hand hygiene to prevent infection in children is becoming increasingly important as Government policy seeks to reduce antibiotic prescribing. This study investigates whether hand hygiene education reduces absenteeism among school children. Study aims include student participation and engagement in science and development of a partnership with Cokethorpe School.

Methods
First-year A-Level students learnt about bacteria, transmission and hygiene. They swabbed sites around the school and took handprints on blood agar. An assembly was presented to children in the lower school (aged 4–11 years, approximately 150 pupils). Following this, younger students created posters for a competition, with winners receiving a giant Rhinovirus. Anonymised data on sick days for 4 weeks following the assembly in January 2016 and the same time-period in 2015 were obtained.

Results
Older students successfully grew and examined bacteria from hands, door handles and other site cultures. Morphology and Gram staining suggested common bacteria were isolated between sites, although formal identification was not undertaken. There was no significant difference in the number of episodes between the two time periods (2015: n=43; 2016: n=46). The number of half-days recorded as sick was similar (2015: n=29; 2016: n=25). There were more episodes of 1 day or more in 2016 due to an outbreak of scarlet fever that coincided with the study (2015: 14; 2016: 21, not significant). Members of the Crook Public Engagement group chose the winning artwork, now on permanent display in the Children’s Hospital, John Radcliffe Hospital, Oxford.

Discussion
The null hypothesis was not refuted but secondary goals were successful with older students keen to do more. In September the older students plan to develop a questionnaire to establish what (if anything) young children take away from targeted messages around hygiene. Ongoing data collection and molecular biology experiments are also planned.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4665
Managing repeated screening for known CPE carriers: Once positive always positive?
Siddharth Mookerjee, Eleonora Dyakova, Frances Davies, Kathleen Bamford, Tracey Galletly, Eimear Brannigan, Alison Holmes, Jonathan Otter
Imperial College NHS Healthcare Trust

Introduction
Once a patient becomes colonised with carbapenemase-producing Enterobacteriaceae (CPE), there are no recommended decolonisation strategies. This leads to uncertainty around how to manage known carriers of CPE while in hospital and on subsequent admissions. We evaluated the results of repeated CPE screens from known carriers to establish the pattern of colonisation.

Methods
From June 2015, our hospitals performed risk factor-based CPE screening of all admissions, universal screening in high-risk specialties, weekly screening in wards where known carriers were present, and contact tracing around newly detected carriers. During June–December 2016, 70 patients were known CPE carriers. The result of serial screens of each patient was scrutinised.

Results
A total of 409 screens were collected from the 70 patients (median 4, range 1–28), with 247 (60.4%) negative and 162 (39.6%) positive. Of the 70 patients, 60/64 patients who had more than one screen (93.8%) had at least one negative screen (93.8%) had at least one negative screen during their hospital stay. Of the 51 that had least three screens, 24 (47.1%) had a “+−+−” pattern, suggesting that apparent spontaneous decolonisation reverted to a positive carriage status.

Discussion
Several factors could explain an apparent reversion from a negative to a positive screen in known CPE carriers, including acquisition of a different CPE while in hospital and on subsequent admissions. This leads to uncertainty around how to manage known carriers of CPE while in hospital and on subsequent admissions. We evaluated the results of repeated CPE screens from known carriers to establish the pattern of colonisation.

Methods
From June 2015, our hospitals performed risk factor-based CPE screening of all admissions, universal screening in high-risk specialties, weekly screening in wards where known carriers were present, and contact tracing around newly detected carriers. During June–December 2016, 70 patients were known CPE carriers. The result of serial screens of each patient was scrutinised.

Results
A total of 409 screens were collected from the 70 patients (median 4, range 1–28), with 247 (60.4%) negative and 162 (39.6%) positive. Of the 70 patients, 60/64 patients who had more than one screen (93.8%) had at least one negative screen during their hospital stay. Of the 51 that had least three screens, 24 (47.1%) had a “+−+−” pattern, suggesting that apparent spontaneous decolonisation reverted to a positive carriage status.

Discussion
Several factors could explain an apparent reversion from a negative to a positive screen in known CPE carriers, including acquisition of a different CPE following genuine spontaneous decolonisation, natural fluctuation in the level of gastrointestinal colonisation perhaps prompted by antibiotic exposure, or a poorly collected microbiological specimen. It is not possible for us to conclude which of these explains the observed apparent changes in carriage status, but the frequent reversion from an apparent negative carriage status to positive carriage status in known CPE carriers suggests that a negative CPE screen should not be interpreted as an indication of loss of colonisation in an individual who has previously been positive.

Declaration of interest
I do not have any conflict of interests to declare.
Abstract ID: 5039

Frequency of use and activation of safety-engineered sharps devices: A sharps container contents audit in seven UK Hospital Trusts

Terry Grimmond
Grimmond and Associates

Introduction
Safety-engineered devices (SED) became mandatory in UK healthcare facilities in May 2013; however, few publications are available as to the impact of the law on adoption of SED in the UK. Monitoring of activation is recommended as non-use and incorrect activation of SED are a common cause of post-procedure sharps injuries. This paper outlines a sharps container (SC) contents audit conducted in seven UK NHS trusts.

Methods
Reusable SCs (Sharpsmart, Daniels Corporation, Melbourne) were randomly selected from seven healthcare facilities (HCF) in central UK. Wearing protective apparel, the operator opened and decanted the SC and sorted and counted hollow-bore needles (HBN) into: SED and non-SED; capped vs. uncapped non-SED needles; and activated or non-activated SED. WinPepi v2.78 was used to calculate probability (p set at 0.05), relative risk and 95% confidence limits.

Results
In total, 322 L of sharps (59.0 kg) from 22 SCs from seven hospital trusts were audited. Many devices were blood-contaminated. Of the 2425 HBN: 49.9% (1210) were SED; 16% of the SED were not activated. Of the 1215 non-SED, 13.4% were capped needles or needle-syringes. Overall, 52.7% of devices were discarded “sharp”.

Conclusions
It is disturbing that over 50% of HBN were discarded sharp, indicating that a high proportion of UK clinical staff are unnecessarily at risk of sharps injuries while handling sharps. The high non-use of SED and non-activation of SED is also disturbing and needs further confirmation. Widespread SED evaluation and adoption (automatic and semi-automatic SED where feasible), repetitive competency training, and safety-ownership by staff, are needed.

Declaration of interest
I do not have any conflict of interests to declare.
Poster presentations

Antimicrobial prescribing and stewardship

Abstract ID: 4445
The susceptibility rates of flomoxef against extended-spectrum beta-lactamase-producing organisms
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Introduction
Flomoxef belongs to cephamycin antibiotics, which cannot be hydrolysed by extended-spectrum beta-lactamase (ESBL). Hence, flomoxef can be used to treat infections caused by ESBL-producing organisms. This study was conducted to evaluate whether the susceptibility rates of flomoxef against ESBL-producing organisms were decreasing year by year.

Methods
At a regional hospital in southern Taiwan, from 2012 to 2015, all isolates of ESBL-producing organisms reported by the clinical laboratory were enrolled in this study. Screening of ESBL production was according to the recommendation of the Clinical and Laboratory Standards Institutes. The screened organisms included Escherichia coli, Klebsiella pneumoniae/oxytoca, and Proteus mirabilis, and a double disc method was used as a method for screening. The disc diffusion method was used for antimicrobial susceptibility testing of flomoxef. The interpretive criteria of flomoxef recommended by the manufacturer were as follows: zone size of susceptibility was ≥18 mm, that of intermediate was 13–17 mm, and that of resistance was ≤12 mm. All intermediate-resistant results were regarded as resistant results in this study.

Results
A total of 3954 isolates of ESBL-producing organisms, including 2912 ESBL-E coli, 895 ESBL-K pneumoniae/oxytoca, and 147 ESBL-P mirabilis, were enrolled. The susceptibility rates of flomoxef against these ESBL-producing organisms were 71.7% (515 of 718), 64.8% (667 of 1029), 64.7% (669 of 1034), and 75.4% (844 of 1120) in 2012, 2013, 2014, and 2015, respectively.

Discussion
This study found that the numbers of ESBL-producing organisms were increasing year by year; however, the susceptibility rates of flomoxef against these organisms did not evidently decline, indicating that flomoxef can be used to treat infections caused by ESBL-producing organisms, and flomoxef-resistant ESBL-producing organisms may not be easily selected. However, further studies may be necessary to confirm these viewpoints.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4446
Doripenem may be the most optimal carbapenem to treat Pseudomonas aeruginosa infections
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Introduction
When antipseudomonal carbapenems, including imipenem, meropenem, and doripenem, were chosen to treat infections caused by Pseudomonas aeruginosa, previous studies revealed that imipenem readily selected imipenem-resistant P aeruginosa, but doripenem did not readily select doripenem-resistant P aeruginosa. This study was conducted to re-investigate this viewpoint.

Methods
At a regional hospital in southern Taiwan, from 2014 to 2015, all isolates of carbapenem-resistant P aeruginosa (CRPA), defined as P aeruginosa being resistant to one or more of antipseudomonal carbapenems, reported by the clinical laboratory were enrolled in this study. The disc diffusion method was used for antimicrobial susceptibility testing. The interpretation criteria were according to the recommendation of the Clinical and Laboratory Standards Institutes 2014. All intermediate-resistant results were regarded as resistant results in this study. The susceptibility rates of each individual antipseudomonal carbapenem against CRPA were analysed.

Results
A total of 296 CRPA isolates, including 136 in 2014 and 160 in 2015, were enrolled in this study. The susceptibility rates of imipenem, meropenem, and doripenem against CRPA were 6%, 4%, and 15%, respectively, in 2014. These were 9%, 19%, and 28% of imipenem, meropenem, and doripenem, respectively, in 2015.

Discussion
This study found that doripenem had the highest susceptibility rates against CRPA, indicating that doripenem did not readily select CRPA. In contrast, imipenem had the lowest susceptibility rates, indicating that imipenem readily selected CRPA. These findings echoed previous studies. According to the results of this study, we suggest that doripenem should be regarded as the first choice when antipseudomonal carbapenems are used to treat infections caused by P aeruginosa. In addition, doripenem may be the optimal carbapenem for empiric treatment of hospital-acquired infections because P aeruginosa should be considered as the likely pathogen in these infections.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4459
In vitro antifungal susceptibility profiles of clinical and environmental species of Aspergillus section Flavi isolated from Iran from 2008 to 2014
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Introduction
Aspergillus species are the most common and life-threatening fungal pathogens among immunocompromised patients, causing a wide range of infections depending on the immune status of the host. Notably, A. flavus is the leading cause of invasive aspergillosis in tropical and sub-tropical countries, including Iran. We therefore aimed to evaluate in vitro antifungal susceptibility (AFST) of nine antifungals against clinical and environmental Aspergillus section Flavi isolates collected in Iran from 2008 to 2014.

Methods
Two hundred strains belonging to Aspergillus section Flavi were identified down to species level by using PCR-sequencing of β-tubuline rDNA gene. In vitro AFST was performed against nine antifungals using the CLSI-M38-A2 protocol for filamentous fungi.

Results
Sequencing analysis on suspected species to Aspergillus section Flavi resulted in A. flavus (118/200, 59%), A. oryzae (69, 34.5%), A. nomius (10, 5%) and
A. tamari was the most prevalent species in Aspergillus section flavi. As our results showed that the new azole itraconazole can be recommended as the most effective antifungal against systemic infections caused by species in Aspergillus section Flavi, awareness is needed about the resistance of these species to amphotericin B. Luliconazole and lanoconazole showed a high efficacy against Aspergillus section Flavi, which make them promising antifungal agents against cutaneous infections such as non-dermatophyte onychomycosis.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4496
Molecular differentiation and antifungal susceptibilities of Candida parapsilosis isolated from the skin of patients with acne clinical protests

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Introduction
Acne is a pathological disorder and a chronic inflammation in the sebaceous follicles and one of the most widespread dermatology problems, and has become more antibiotic-resistant. Probiotics have been found to be efficacious in preventing UTIs in post-menopausal women.

Conclusion
I do not have any conflict of interests to declare.

Abstract ID: 4581
Recommendation for empirical antibiotic therapy in catheter-associated urinary tract infection in persons with spinal cord injury based on a randomised controlled trial (ProSCIUTTU)

Dr Swee-Ling Toh1, Dr Bonnie Bon San Lee1, Dr Kate Clezy1, Dr Peter Taylor2, Dr Ryani Pratama2, Dr Obaydullah Marial1, Professor Judy Simpson2, Dr Justin Tan1
1Prince of Wales Hospital, 2South Eastern Sydney Local Health District, 3University of Sydney

Introduction
Current Australian antibiotic therapeutic guidelines recommend that symptomatic catheter-associated urinary tract infections (CAUTIs) should be treated by removing or changing catheters and treating CAUTIs based on results of cultures and susceptibility testing obtained from a new catheter. The empirical antibiotic therapy for severe UTIs is intravenous gentamicin and amoxy/ampicillin. Persons with spinal cord injury (SCI) with neurogenic bladders who require ongoing catheterisation often have asymptomatic bacteriuria. Current treatment of UTI in SCI is not well standardised with limited evidence.

Method
ProSCIUTTU was a randomised controlled trial investigating whether probiotics reduce UTIs in participants with neurogenic bladder secondary to SCI. For study endpoint, participants had to meet clinical and microbiological criteria. The urine cultures and antibiotic susceptibility testing of endpoint participants were studied. The aim was to see whether empirical antibiotic therapy suggested by the therapeutic guidelines for severe UTI applies to SCI persons with catheters.

Results
53/207 participants met study endpoint criteria for UTI. 51% were tetraplegics. 45% had suprapubic catheters. 77% were outpatients. 42/53 urines reported pure growth of an organism. 36/42 urines grew Gram-negative organisms. The predominant species was Escherichia coli (14/36). 20/22 of the Enterobacteriaceae were susceptible to amoxycillin + clavulanate. Only a small number were tested for sensitivity to gentamicin. 2/6 of the Gram-positive were sensitive to ampicillin/amoxycillin. 9/36 grew Pseudomonas. Pseudomonas was susceptible to ceftazidime in 5/6 of UTIs and to gentamicin in 8/9 of UTIs.

Conclusion
Current Australian antibiotic guidelines for severe UTI are applicable for persons with SCI who are catheterised. However, if there is a history of prior colonisation or infection with Pseudomonas species, amoxy/ampicillin should be substituted with ceftazidime. It is reassuring that, despite prolonged catheterisation and frequent hospitalisation in this cohort of participants, the prevalence of multi-resistant organisms was low in each category of organism.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4582
Probiotics (RC14-GR1 or LGG-BB12) versus placebo as prophylaxis for urinary tract infection in persons with spinal cord injury (ProSCIUTTU): A randomised controlled trial

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Background
Urinary tract infections (UTIs) are very common in people with spinal cord injury (SCI). UTIs are increasingly difficult to treat as the organisms that cause them become more antibiotic-resistant. Probiotics have been found to be efficacious in preventing UTIs in post-menopausal women.
Aim
The main aim of this study is to determine whether probiotic therapy with combinations of *Lactobacillus reuteri* RC-14 + *Lactobacillus rhamnosus* GG + *Bifidobacterium* BB-12 (LGG-BB12) and/or *Lactobacillus rhamnosus* GR-1 (RC14-GR1) and/or *Lactobacillus rhamnosus* GG + *Bifidobacterium* BB-12 (LGG-BB12) are effective in preventing UTI in people with SCI.

Study design
A double-blind factorial-design randomised controlled trial with 3-year recruitment was used.

Setting
The research took place in multiple spinal units in New South Wales, Australia with their rural affiliations.

Methods
Eligible participants were people with SCI and stable neurogenic bladder management. Two hundred and seven participants were randomised to one of four arms: RC14-GR1+LGG-BB12, RC14-GR1+placebo, LGG-BB12+placebo or two placebo capsules for 6 months. All regimens were indistinguishable in appearance and taste. Randomisation was stratified by bladder management type and inpatient status. The primary outcome was time to occurrence of symptomatic UTI.

Results
Patients randomised to RC14-GR1 did not have a longer time to UTI than placebo (HR 0.68, 95% CI: 0.39–1.19, *p*=0.17) after allowing for pre-specified covariates. Patients randomised to LGG-BB12 also did not have a longer time to UTI than placebo (HR 1.30, 95% CI: 0.74–2.26, *p*=0.36). Multivariable post hoc survival analysis for RC14-GR1 only vs. the other three groups showed a possible protective effect of RC14-GR1 only (HR 0.46, 95% CI: 0.21–0.99, *p*=0.03), but this result would need to be confirmed in another study before clinical application.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4583
To treat or not to treat: A review of indeterminate *Clostridium difficile* cases and their antibiotic management
Joanne Prince, Mr Paul Bolton, Dr Layth Alsaffar
The Royal Bournemouth & Christchurch Hospitals NHS Foundation Trust

Improvement issue and context
We investigated antibiotic treatment of inpatients with indeterminate *Clostridium difficile* results (GDH positive, toxin negative) over the period October 2014 to May 2015 within one 609-bedded Acute Trust. We found that out of 67 patients identified with indeterminate *C. difficile* results, 26 (40%) were treated for *C. difficile* infection, including five who tested negative by PCR (Gene Expert) and were therefore treated inappropriately with antibiotics.

Methods and measurement
The management of indeterminate *C. difficile* cases was reviewed and a revised plan was implemented. The new plan required all indeterminate *C. difficile* results to have a further PCR test. Indeterminate samples that were PCR positive would then have a repeat toxin A/B test performed on subsequent samples obtained at 48 and 72 hours after the stool sample. Antibiotic treatment would only be commenced if this subsequent test was positive or if *C. difficile* seemed the mostly likely clinical diagnosis based on raised WCC, Bristol score stool type 5 to type 7 >3 times per day or evidence of acute renal failure (creatinine >150% above baseline) following review by the Infection Prevention and Control team. Indeterminate cases that were PCR negative were not recommended for treatment.

Evidence of improvement
Evaluation of these changes was carried out by reviewing patients with indeterminate *C. difficile* results from September 2015 to April 2016. During this period only 19% (12/64) indeterminate patients were treated with antibiotics. An incidental finding was that the average length of stay for these patients decreased by 5 days and the average length of diarrhoeal symptoms decreased by 1 day (as defined as passing a Bristol score type 1 to type 4 and 48 hours symptoms free).

Future steps
Further repeat evaluations should be utilised to ensure that this policy change is embedded in our Trust and continues to have a positive impact on patient outcome and care.

Declaration of interest
I do not have any conflict of interests to declare.
Decontamination of environment

Abstract ID: 4486
From moor to shore: The Water Safety Care Bundle
Sally Fletcher, Haill Claire, Peter Jenks, Julie Richards, Phil Tarbuck
Plymouth Hospitals NHS Trust

Improvement issue and context
Like most developed countries, we take the water that comes out of our taps for granted. In reality, a lot of work goes on behind the scenes to ensure that our water is safe. Water safety is not the responsibility of one person or department. It requires a team approach, uniting outside agencies with in-house cooperation.

Lapses in water safety can have devastating results, as the Pseudomonas aeruginosa outbreak in the Neo-natal Units in Northern Ireland demonstrated.

The implementation of HTM 04-01 raised awareness of water safety, not only in augmented care areas but throughout our hospital.

Echoing the principles of the Saving Lives High Impact Interventions, the Water Safety Care Bundle recognises that all groups – South West Water, Site Services, Pro-economy, Water Assurance Group, Infection Prevention and Control, Serco and clinical staff – must play their part if water safety is to be maintained.

Methods and measurements
Each group has specific actions and responsibilities as set out in the Water Policy. Measurements of compliance include regular water sampling, total viable counts (TVC), flushing logs, observations on our “water walk arounds” and a review of sink traps during augmented care environmental sampling.

Evidence of improvement
Standard Operating Procedures are now in place for positive Pseudomonas aeruginosa and Legionella samples. The Pseudomonas database for augmented care areas has increased our knowledge of strains within the hospital. Increased compliance of flushing is reflected in the TVCs.

Future steps
Maintenance and improvement of the Water Safety Care Bundle depends on developing our relationship with South West Water and Pro-economy whilst encouraging clinical engagement within our Trust. Our network of infection prevention link practitioners will be essential to ensuring that water safety practices are maintained in a pressurised and fluid healthcare organisation.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4622
Critical care be Pseudomonas aware
Mark Garvey, Mr Craig Bradley, Ms Kerry Holden, Mrs Jane Parkes, Mrs Tracey Martin
University Hospitals Birmingham NHS Foundation Trust

Introduction
Pseudomonas aeruginosa is a ubiquitous and important opportunistic pathogen in the healthcare setting, particularly affecting those with impaired host or mucosal immunity. It is found in a wide range of moist, nutrient-limited environments and may colonise hospital and domestic water taps, sinks, drains, toilets, and showers. Here we report our experience in reducing the transmission risk of P. aeruginosa from water in a critical care unit.

Methods
To reduce the risk of transmission we examined: the role of disposal of patient waste water; the installation of new tap outlets that are redesigned either to prevent contamination or enable decontamination; the cleaning of taps appropriately; and the frequency of water sampling to identify outbreaks. Water samples were taken from the tap outlets and tested for the enumeration of P. aeruginosa and the number of tap outlets being colonised with P. aeruginosa was monitored daily, with all strains being molecularly typed via pulse-field gel electrophoresis.

Results
From the water sampling undertaken on the critical care unit, 25% of the outlets were positive for P. aeruginosa over a year. New taps are to be installed on part of the unit; in addition to this a new three-cloth cleaning method has been implemented, as well as using gel sheets to solidify patient waste water being disposed of in a macerator. All these initiatives have resulted in a reduced number of tap outlets being colonised with P. aeruginosa and the number of patients acquiring P. aeruginosa infections.

Abstract ID: 4614
What interventions brought a reduction in CPE cases at the University Hospital of South Manchester NHS Foundation Trust
Jay Turner-Gardner, Dr Stephanie Thomas
University Hospital of South Manchester NHS Foundation Trust

Service improvement
Improvement issue and context
Antimicrobial resistance is one of the defining public health problems of our age. New resistance mechanisms continue to emerge, making control of infection both more difficult and more important than ever. The rapid spread of carbapenem-resistant Enterobacteriaceae (CPE) is one of the most worrying examples, as it is usually asymptomatic, highly transmissible and is almost impossible to treat.

Methods and measurement
In 2015, University Hospitals of South Manchester (UHSM) introduced new initiatives to combat the growing number of CPE cases each month. Interventions were as follows: reactive Hydrogen Peroxide Vapour following discharge of CPE patients. This ensured that patients were being admitted to safe environments. Further to this, we introduced an HPV managed service which enabled us to decontaminate high-risk areas proactively and reduce environmental bio-burden in shared areas such as toilets and sluices. In 2013, Public Health England published the “Toolkit”, a package of interventions to help hospitals detect, manage and control CPE, which UHSM also implemented.

Evidence of improvement
UHSM had some of the highest rates of CPE in the country. The interventions stated above led to substantial reductions in infections and outbreaks. The Trust has seen a 58% reduction in CPE incidences in 2015/2016 compared with 2014/ 2015. Evaluation suggests that compliance with the CPE Toolkit and the introduction of emergency and elective screening of patients who fit the criteria of admission to a hospital within 12 months, full multi-disciplinary team (MDT) outbreak meetings and the introduction of a HPV managed service has played a key part in this reduction.

Future steps
UHSM will continue to identify methods of decontaminating areas we are currently unable to reach with HPV, and potentially look to implement new, faster technology for these areas. UHSM will also continue to train staff to ensure an ever greater compliance with the CPE Toolkit.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4610
I do not have any conflict of interests to declare.
Discussion
Our report shows that the role of water-borne transmission of P. aeruginosa in a critical care setting cannot be overlooked. In units where transmission is seen, more frequent water sampling should be undertaken to monitor the risk. To reduce the risk of transmission we show that healthcare institutions need to examine intrinsic, holistic, and engineering factors to be successful.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4624
The efficacy of a new superoxide water on biofilms
Professor Steven Percival, Dr Louise Suleman
SD Health Protection Group Ltd

Introduction
Superoxide water is composed of a number of active agents that predominantly include hypochlorous acid, sodium hypochlorite and chlorine. Different concentrations of these active agents exist in different superoxide compositions. Despite this, they are all known to be fast-acting antimicrobials with a broad spectrum of activity on planktonic micro-organisms, as well as clostridium spores, warranting their usage in the area of infection prevention and control. The efficacy of the different superoxide water compositions available has been reported on planktonic micro-organisms. However, the efficacy of superoxide waters on biofilms is lacking. Consequently, the aim of this study was to investigate the efficacy of a new superoxide composition on in vitro mono-culture and polymicrobial biofilms, utilising a range of different biofilm models relevant to infection prevention and control.

Methods
A range of clinically significant Gram-positive (including meticillin-sensitive and meticillin-resistant Staphylococcus aureus), Gram-negative (Pseudomonas aeruginosa, Acinetobacter baumannii), spore-forming bacteria (Clostridium difficile) and yeasts/fungi (Candida albicans and Aspergillus sp) were exposed to a novel superoxide formulation in various non-biofilm models. In addition, the anti-biofilm efficacy of the new superoxide composition was evaluated in numerous biofilm models that included the Centers for Disease Control (CDC) Biofilm Bioreactor, the Minimum Biofilm Elimination Concentration (MBEC) model, the drip slide model and a novel poloxamer model.

Results and discussion
All antimicrobial studies evaluated on planktonic microbes demonstrated that the new superoxide composition was a fast-acting and effective broad spectrum antimicrobial following a contact time of only a few minutes. Within all the mono-culture and polymicrobial biofilm models evaluated, the new superoxide formulation also demonstrated effective anti-biofilm activity on both mono-culture and polymicrobial immature and mature biofilms. Overall, this new superoxide water composition has demonstrated both a broad anti-microbial and anti-biofilm activity that would warrant its usage for applications in the prevention and treatment of biofilms.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4640
A dry biofilm model for clinical disinfectant efficacy testing
Dr Jawal Said1,2, Tamara Perez Outeiral2, Professor Jean-Yves Mailler2
1GAMA Healthcare Ltd, 2Cardiff University

Introduction
Recent evidence has shown persistence of viable organisms in dry biofilms found in clinical settings even after terminal cleaning and disinfection. The work presented here demonstrates the use of a dry biofilm model to investigate the efficacy of various disinfectants with the overall aim of eliminating biofilm on dry environmental surfaces following appropriate cleaning/disinfection combinations.

Materials and methods
Staphylococcus aureus (NCIMB 9518) biofilms were grown in tryptone soy broth on 10 mm diameter AISI 430 stainless steel discs at room temperature (20–23°C) for 12 days with rotation between wet and dry phases (at 37°C) every 48 hours. Dry biofilms were then exposed to disinfectant solutions with varying exposure times or wiped with disinfectant wipes using the ASTM2967-15 test. For comparison, wet biofilm of S. aureus grown for 48 hours and dried S. aureus inoculum on stainless steel discs (BS EN 13727) were used. Disinfectants included chlorine, glutaraldehyde and peracetic acid. Assessment of efficacy measured biomass reduction by crystal violet staining, biofilm recovery after 24 hours and beyond indicated by a pH indicator colour change in the growth medium and transfer of bacteria from surface to surface immediately and then 24 hours following intervention.

Results and conclusions
Dry biofilms were found to persist even after biocidal exposure – with a difference in susceptibility when compared with “wet” biofilm or planktonic bacteria dried on surfaces. The complete removal/destruction of dry biofilms from surfaces appears not to be currently achievable using current disinfectants without damaging the surfaces, although disinfectant wipes were more effective. Some biofilm recovery was observed with the colorimetric medium after 24–48 hours following some but not all interventions. The results highlight that while the aim of eliminating dry biofilm is not currently achievable, a realistic approach may still involve making surfaces safe by controlling biofilm regrowth and by preventing transfer of micro-organisms.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4645
Development of rapid process-monitoring devices to support the validation and use of hydrogen peroxide decontamination systems in hospitals
Neil McLeod, Mrs Melanie Clifford, Dr Mark Sutton
Public Health England

Introduction
Hydrogen peroxide vapour (HPV) decontamination systems are increasingly used in hospitals to reduce the incidence of infections. Whilst HPV has demonstrated efficacy against many healthcare pathogens, it remains crucial to consider environmental factors (i.e. room-volume, furniture and construction) to ensure decontamination is effective. HPV providers validate their systems using biological indicators (BIs) containing 10° Geobacillus stearothermophilus spores. BIs require specialist facilities for growth, up to 7 days to confirm decontamination efficacy and can be unreliable. In this study, the possibility of monitoring decontamination efficacy using a thermosetable adenylate kinase (tAK) “enzyme indicator” (EI) was evaluated. EIs showed proportional inactivation following HPV exposure and provided quantifiable and auditable data within minutes. EIs could provide rapid reassurance on process efficacy for hospital infection control teams and HPV system providers.

Methods
BIs and EIs were exposed to HPV in a whole-room setting using a commercial system. The process was performed using a range of HPV exposure times, doses and environmental changes. Following exposure, remaining viability/activity was assessed; BIs were incubated at 56°C and monitored for bacterial growth over 7 days whilst tAK activity was measured using ATP-luciferase assay in a benchtop luminometer.

Results
EIs provided a rapid and sensitive measure of the HPV process. Both BIs and EIs were able to demonstrate sub-optimal HPV cycles, resulting from reduced time, dose and environmental factors. BIs gave a qualitative pass/fail answer within 7 days whilst EIs provided a quantifiable measurement within minutes.
By defining a threshold value, the EIs could predict subsequent failure of BIs with high probability.

**Discussion**

TAKE EIs can provide rapid information on HPV process-efficacy, that can be acted upon in near real time, to support management of facilities being decontaminated. The ability to show performance that is equivalent to inactivation of BIs enables the process to be benchmarked against industry standards.

**Declaration of interest**

I do not have any conflict of interests to declare.

**Abstract ID: 4654**

**Biofilms, anti-biofilm agents and wounds**

Professor Steven Percival, Dr Louise Suleman

5D Health Protection Group Ltd

**Introduction**

High-risk acute and chronic wounds that demonstrate a poor response to prophylactic and therapeutic levels of antisepsics and/or systemic antibiotics, and deteriorate once the antimicrobial is removed, are considered a good marker for biofilm evidence. Biofilms in wounds have been documented and are considered to delay wound healing and increase the wound’s propensity to infection. Consequently, it is important that for those wounds which are infected with a virulent biofilm, new anti-biofilm agents are developed which focus on breaking down the biofilm and preventing microbial re-attachment. In addition to this, biofilms are also known to house *Acanthamoeba spp*, enabling them to act as potential reservoirs of opportunistic pathogens and increasing a wound’s risk of infection. The aim of this study was to evaluate the anti-microbial and anti-biofilm ability of a new patented broad spectrum anti-biofilm formulation designed to be used in central venous catheters, urinary catheters, skin and wound care.

**Methods**

The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) was determined against 50 clinical isolates – Gram positive (*Staphylococcus epidermidis*, *S. aureus*, meticillin-resistant *S. aureus*), Gram negative (*Enterococcus faecium*, *E. faecalis*, *Klebsiella* sp, *E. coli, Enterobacter cloacae, Pseudomonas aeruginosa, Acinetobacter baumannii* and *Proteus* sp) and yeasts/fungi. The anti-biofilm ability of this novel anti-biofilm formulation was determined on preformed young (24 h) and old (6 months) biofilms. The anti-biofilm activity was also evaluated on pure cultures of *Acanthamoeba spp* and also *Acanthamoeba spp* that had ingested viable opportunistic pathogens.

**Results and discussion**

The anti-biofilm agent was shown to be effective against both young and old biofilms. The anti-biofilm efficacy varied between species, with the greatest efficacy observed on Gram-positive bacteria. *Acanthamoeba spp* was eradicated following 24 hours exposure to the anti-biofilm composition. The anti-biofilm formulation provides a novel alternative for wounds at risk of infection and/or infected.

**Declaration of interest**

I do not have any conflict of interests to declare.
Decontamination of equipment

Abstract ID: 4487

Have you cleaned your stethoscope today? A national, multi-centre study on stethoscope cleaning practices

Maria Goryaeva, Shair Ali, Nicholas Cereceda-Montelova, Rafał A Kotronias, Nicholas Ward, Gabriel Sherliker, Chidi Amadi, Ibrahim Sheriff, Daniel Fountain
FMLM Medical Student Group

Introduction
Stethoscopes have been implied to transmit micro-organisms, including methicillin-resistant Staph aureus (MRSA) and Clostridium difficile. Therefore, a contaminated stethoscope could conceivably confer a significant risk of healthcare-associated infections (HCAIs). Currently, there is no consensus on optimal stethoscope cleaning methods. This study aims to assess current cleaning practices at four sites across the UK.

Results and discussion
92.5% of respondents felt it is clinically important to clean the stethoscope regularly and 76.9% felt that clean stethoscopes could reduce the number of HCAIs. Reasons given against were that of a lack of evidence. Only 7.5% of respondents clean their stethoscope in between every patient, and 11% of respondents have never cleaned theirs. 61.3% of respondents noted that they use their stethoscope in isolation rooms, with 23% of those never cleaning their stethoscope either before or after the consultation. Better distribution of antiseptic wipes around clinical areas was identified as the best motivator to increasing stethoscope cleaning. Despite a consensus among medical professionals about the importance of stethoscope cleaning, current stethoscope cleaning practices are inadequate and could therefore play a role in infection spread. Personal stethoscopes are frequently used in isolation rooms, which is pertinent in view of previous reports demonstrating contamination of stethoscopes with micro-organisms such as *C. difficile* and *MRSA*. The study highlights that a better availability of antiseptic wipes in clinical areas may motivate healthcare providers to clean their stethoscopes more frequently. Future studies could look at the distribution of antiseptic wipes in clinical areas and also the role of visual reminders such as posters in improving current practices.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4510

What lies beneath? Do Emergency Department (ED) patient trolleys present an infection risk to our patients?

Chris Paterson
NHS Ayrshire and Arran

Introduction
Emergency Departments (EDs) are facing an unprecedented future: unannounced audits by Infection Prevention and Control Teams and the Healthcare Environmental Inspectorate; arduous waiting time targets set by the government and treatment of an increasing number of patients with ever more complex conditions and needs – all of which contribute to the extreme challenges within an ED. Nevertheless, safe patient care is a fundamental priority in reducing healthcare-associated infection (HAI).

Methods
Six ED patient trolleys were selected from two acute University Hospitals that were either prepared (n=3) or had just been cleaned (n=3) for a new arrival to the department. Firstly, the trolleys were inspected for any visible contamination. Then, after the swabs were dipped into normal saline, the trolleys were swabbed on a symmetrical 10–15 cm section of the handrail, trolley frame and head rest. The swabs were immediately plated onto blood agar, sealed, then taken to the labs for an incubation period of 48 hours.

Results
Three of the six trolleys had visible blood contamination. Total colony count ranged from 5 to >450 for each swab. The hand rail had the highest colony count of organisms, followed by the bed frame, then the headrest. Organisms included *Staphylococcus aureus*, *Staph sp.*, *Bacillus cereus*, *Bacillus sp.*, *Dermacoccus nishinomiyaensis*, *Micrococcus luteus* and *Kocuria rhizophila*. No antimicrobial sensitivities or viral testing was conducted.

Discussion
In spite of ED trolleys being cleaned between patient use and as per local protocol, blood and body fluid contamination and substantial bacterial counts remain. The number of HAI's which originate from an ED trolley is unknown; likewise, acceptable colony counts or organism species would be speculative. Therefore, a more proactive, robust approach is required to decrease visual contamination and potentially pathogenic micro-organisms which may compromise the care and safety of our patients.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4596

An organisation’s city-wide approach to decontamination

Claire Hayward, Emma Spooner
Royal Wolverhampton NHS Trust

Introduction
The organisation’s previous method of decontamination was to use a two-stage process of detergent and alcohol for patient equipment and medical devices. Observational evidence identified that this process was not being followed, with areas using just alcohol to disinfect equipment without prior cleaning, thus rendering the process ineffective.

Method
The Infection Prevention Team (IPT) explored ways of improving compliance and it was decided that a combined detergent/disinfectant wipe could be beneficial. A trial was held to evaluate compliance and staff views on the change in practice and products. The areas chosen had been noted on audit to have poor compliance with equipment and medical device decontamination.

Collaborative working with IPT and Procurement enabled the exploration of a single-stage process for decontamination and the opportunity to standardise products across the organisation. The costs for using the single-step and two-stage processes were compared.

The combined detergent/disinfectant wipe was rolled out to all areas of the organisation across three separate inpatient sites. Following successful acute implementation and positive evaluation, the product was rolled out to community sites, ensuring a standardised city-wide approach to decontamination.

The roll-out was supported by the company, with training sessions delivered to all areas on correct usage, and dispensers were fitted bespoke to all clinical areas based upon need.

Discussion
The introduction of a single-step approach to decontamination has shown an increase in compliance and a reduction in healthcare-associated infection (HCAI). Environmental assurance data has shown an average increase from
85% to 90% between December 2015 and February 2016. The *Clostridium difficile* infection rate reduced from 29.27 per 100,000 bed days on introduction to 8.65 following full implementation. The introduction and the change to a single supplier has also made a significant cost saving to the organisation.

**Declaration of interest**
I do not have any conflict of interests to declare.

**Abstract ID: 4664**

**Reducing SSI risk from water heater/cooler units in cardiothoracic surgery**

Moya Alexander, Anan Ghazy, Kathleen Bamford, Eimear Brannigan, Hugo Donaldson, Henry Bishop, Jonathan Otter

Imperial College NHS Healthcare Trust

**Improvement issue and context**
A small number of patients undergoing cardiac surgery where cardiopulmonary bypass machines were used developed a surgical site infection (SSI) with *Mycobacterium sp.*, including one locally. We report the measures implemented to reduce the risk of contaminated aerosols from heater cooler units (HCU) used in cardiothoracic surgery, guided by PHE and the MHRA.

**Methods and measurements**
Water and air sampling commenced in June 2015. The frequency of disinfection was increased in September 2015. The Trust has purchased a new HCU (an increase from five to six) to allow HCUs to be returned for manufacturer decontamination on a rotational basis, commencing September 2015. A dedicated tap with a point-of-use filter has been installed at Hammersmith for filling the machines. The HCUs have been located as far from the patient as possible, and surveillance for water-related organisms in SSIs has been enhanced.

**Evidence of improvement**
All HCUs have grown *Mycobacterium sp.* in water and air. The proportion of air samples growing *Mycobacterium sp.* or overgrown with fungi was significantly lower after September 2015 (40% of 50 vs. 16% of 50, p<0.01). Use of disposable warming mattresses was maintained and decontamination of connectors included in disinfection routines.

**Future steps**
We are looking at ways of capturing aerosols from the machines, and potentially moving HCUs out of theatres. Air and water testing for fungi has commenced to evaluate a potential further risk of aerosolising fungi in the theatre. The levels of *Mycobacterium sp.* are decreased and remain at a static level for both water and air.

**Declaration of interest**
I do not have any conflict of interests to declare.
Education and training

Abstract ID: 4484

The impact of implementing a structured educational programme on hospital environmental cleanliness

Adila Zahir
McGill University Health Centre, Royal Victoria Hospital, Montreal

Issue
Clostridium difficile infection (CDI) is considered to be one of the most uncontrolled nosocomial infections in a colorectal surgery unit “4NW” of a tertiary hospital in Montreal. Environmental contamination with CDI spores has been associated, in the literature, with its indirect transmission. Thus, appropriate environmental cleaning and disinfection in healthcare facilities remain a fundamental aspect of CDI control.

Aim
This study aims to determine whether the establishment of a structured educational programme based on repetitive teaching and cleaning monitoring could improve environmental cleaning practice.

Method
We used an experimental design pre/post-test with a controlled group represented by 3W (a surgical unit), while 4NW represents the pilot unit. In both units, random rooms including frequently touched surfaces and equipment were tested using the fluorescence technique (Glo-Germ). Staff on 4NW exclusively received instant feedback on the audit result and were instructed repeatedly on proper cleaning. Rooms and equipment were retested on three other occasions. Pre- and post-intervention values were then compared. Our intervention was guided by the Model for Improvement as a framework using Plan–Do–Study–Act cycles to test the changes on a small scale.

Results
The percentage of cleaned surfaces improved incrementally on 4NW between the trials and went from 28% pre-intervention to values of 70%, 72%, and 66%. The percentage of cleaned equipment had also improved and went from 11% to values of 46%, 71%, and 67%. No significant improvement was observed in the controlled unit where the results never reached 15% among nursing equipment and 52% among surfaces.

Conclusion
An educational programme may result in improvement of hospital environmental cleanliness. Such a programme should include efforts to control quality with continuous feedback to employees to effectively support the change.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4493

Mental health and learning disability: The evolving role of the IPC Champion!

Claire Foster, Emma Rolfe
Tees, Esk and Wear Valley NHS Foundation Trust

Service improvement
Improvement issue and context
This discussion of the evolving role of the Infection Prevention and Control (IPC) Champion takes place in the context of the ever-changing challenge of clinical staff providing support to IPC teams regarding communication and ownership of IPC within a Trust of over 6500 staff, providing mental health and learning disability services to patients across a large geographical area.

Methods and measurements
The evolving role
2004–2010 Traditional IPC “Link Nurse”. Delivery model: Face to face on Trust sites, and staff attended educational sessions.
2010–2013 IPC “Link Practitioners”. Commencement of annual study days, basic roles and responsibilities established and electronic quarterly newsletters introduced.
2014–Present IPC “Champions”. Introduced annual induction days to support new champions. Continuation of annual study events for all providing training updates and networking opportunities.

Roles and responsibilities have been reviewed and updated. A contract between the champion, IPC team and ward manager has been developed which is linked to Knowledge Skills Framework and Infection Prevention Society competencies. An Intranet page and specific email account has been established which facilitates communication and education.

Biannual champion initiatives address relevant IPC issues and further develops the champion’s role. Champions complete audits as part of their role to monitor, maintain and improve standards of IPC.

Evidence of improvement
A questionnaire has been devised and disseminated to all champions to evaluate the success of introduced changes. Modern matrons support the role of champion and information is shared at the IPC Committee quarterly.

Initiatives delivered successfully:
- A poster was developed explaining the importance of decontaminating multiple patient equipment and is now displayed Trustwide.
- Twenty-six areas received a “Sharp Safety” presentation.
- An electronic version of the Essential Steps Audit Tool was created and guidance for use disseminated to IPC champions.

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Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4544

Use of a Diarrhoea Assessment and Management Pathway to promote best practice

Angela Craddock, Mrs Louise Caisley
Queen Elizabeth Hospital Gateshead

NHS Trusts in England are required to report all Clostridium difficile toxin-positive cases in patients over the age of 2 years to the Department of Health mandatory surveillance programme. The NHS has made great impact in reducing the numbers of Clostridium difficile (CDI) infection, with Trusts needing to demonstrate year-on-year reductions.

However, nationally, the rate of improvement for CDI has slowed in recent years. A significant proportion of healthcare-acquired infections can be prevented by the adoption of evidence-based infection prevention and control standards.

Our acute Trust developed a bespoke Diarrhoea Assessment Management Pathway (DAMP record) to assist in the identification and management of the patient with potentially infective diarrhoea. The document promotes consistent record keeping and prompts staff to implement a bundle of risk-reducing interventions.
It is important for clinical staff to understand risk assessment, recognising infection potential in their patient group. Comprehensive assessment is required to establish type and possible cause of diarrhoea, to isolate the patient at the earliest opportunity and submit a stool sample for testing, where appropriate.

The DAMP record should commence following the patient’s first episode of Bristol Stool Chart type 5–7. The Bristol Stool Chart is incorporated in the DAMP record. It is a comprehensive tool, informative guide and monitoring record requiring education and training, engagement and ownership by clinical teams. The pathway is subject to continuous audit and development by our team to measure compliance across the Trust, encouraging continuity of care throughout the patient journey.

The IPC supports ward teams in cultivating clinical excellence, positive communication and reinforcement of best practice. We engage with staff, sharing lessons learned as part of our ongoing commitment to patient safety.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4598
Exploring local and worldwide staff attitudes to the flu vaccine
Jennifer Adams
Cheshire & Wirral Partnership NHS Foundation Trust

Introduction
In the Flu Plan for Winter 2014/2015, Public Health England stated that “Flu is an unpredictable but recurring pressure that the NHS and public faces each winter…” (PHE: 4). The same document also acknowledges that an increase in the uptake of the flu vaccine is still required for all healthcare workers (HCWs) with direct patient contact.

HCWs are at risk of occupational exposure, and can act as vectors in the transmission of the virus. Despite the risks associated with influenza, uptake in HCWs remains suboptimal.

Methods
In order to explore both local and worldwide attitudes toward the uptake of the influenza vaccine, a literature review was conducted as part of the “Management of an Infection Prevention and Control Service” (MICS) course at the University of Manchester, in January 2015. The aim was to explore potential methods of improving uptake amongst HCWs, based on some of the reasons given for non-acceptance of the vaccine. The literature search included research papers from France, the USA, Srinagar, the United Arab Emirates, Kuwait, Oman, the Republic of Korea and the UK. Papers selected were based on quantitative research, with findings expressed as numerical data. Primary sources were preferred over secondary sources.

Results and discussion
Common themes were identified worldwide. Although influenza causes high numbers of deaths, vaccination rates amongst HCWs remain suboptimal. Aspirational rates of 75% were seldom achieved. Knowledge and understanding of the aetiology of the influenza virus was seen to directly affect uptake rates. Inhibiting factors, barriers and reasons for low uptake were similar across the world. There is a general acknowledgement that ongoing education regarding the risks and benefits of the vaccine for HCWs is essential, in order to minimise the effects of popular myths about flu and the flu vaccine. Education campaigns need to be innovative and ongoing. Information is essential!

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4600
Paediatric infection prevention and control in Critical Care: What do nursing staff really know?
Claire Oliver, Dr Richard Cooke
Alder Hey Children’s Hospital

Introduction
Paediatric critical care units (CCUs) are highly specialist areas managing complex patients at increased risk of healthcare-associated infections. As a consequence, staff need more bespoke Infection Prevention Control (IPC) training to address their learning needs. Our IPC nursing team therefore wished to assess the existing knowledge of CCU nursing staff in order to provide an IPC training programme tailored to staff’s needs.

Methods
A brief electronic survey of 10 questions, taking approximately 5 minutes to complete, was sent to all CCU nursing staff. The questions were unambiguous and asked nurses to rate their personal IPC knowledge, self-assess their ability to implement IPC best practices and suggest ideas for future IPC training.

Results
Out of 269 questionnaires sent out, only 74 staff (26%) responded to the survey. The majority of respondents were band 5 or 6, reflecting the commonest nursing bands on our CCU. Analysing the responses, there was considerable confusion over the understanding of contact/droplet/airborne IPC isolation precautions and associated use of appropriate personal protective equipment. The survey did provide the IPC team with some very positive feedback both on staff engagement and future trainings needs.

Discussion
Though most staff rated their personal IPC knowledge as above average, the survey did identify areas of weaknesses which require further IPC support. This will allow the IPC team to develop a more in-depth training programme to fit the needs of our CCU staff.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4610
Establishing proof of concept for a tablet-based dynamic visualisation tool for use in staff training for the prevention of healthcare-associated infections
Professor Alastair Macdonald1, Dr Colin Macduff2, Dr David Loudon3, Ms Susan Wan1
1Glasgow School of Art, 2Robert Gordon University, 3Formerly Glasgow School of Art

Introduction
Developments in computer-generated visual imaging and mobile computing devices, combined with new research evidence on the behaviour of people and pathogens in hospitals, present opportunities for innovative training to prevent healthcare-associated infections (HAI)s. Within this context, this poster summarises the development and evaluation of a new tablet-based tool.

Method
A three-stage iterative prototyping and co-development process involved doctors, nurses, domestic staff and hospital staff in other job roles (n=150). Themes of pathogen location, pathogen survival (before and as a result of cleaning) and pathogen transmission were developed and visualised for each of three pathogens – MRSA, C. difficile and norovirus – using an evidence-based approach, e.g. employing pathogenic data showing recontamination after cleaning and covert observational data on “who touches what” in the ward setting. Context was provided through a virtual ward setting, enabling zoom-in and zoom-out to various locations and to provide macro/micro-scale views. Learning points, risk to patient and other text-based information relevant to job roles and tasks accompanied the visualisations. Data was acquired at each of the three stages from staff completing workbooks as they viewed and interacted with the prototype tool, and participated in group discussion.

Findings
Visualisations were engaging and supportive of different learning styles. They offered staff a new perspective on pathogens, being able to “see” them contextualised in the virtual ward, making them seem more real. Information proved relevant for different staff cohorts, with a mix of experience levels. They increased participants’ awareness about pathogens by explaining “why” (through dynamic visuals and information) IPC procedures should be followed.
Further applications were suggested, including at clinical induction, education in schools/universities, and refresher courses.

Discussion/conclusion
This systematic process has established proof of concept for the tool. A stage 4 prototype is now being developed with the intention of trialing by IPC managers during in-ward use.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4612
Increasing influenza vaccine uptake from 44% to 77%
Samantha Moorehouse
Bradford District Care Foundation Trust

Improvement issue and context
Each year, particularly during winter, influenza is a significant cause of morbidity and mortality. The influenza vaccine has been shown to be effective at reducing the severity of illness and preventing death. For this reason the Department of Health has a vaccination policy for vaccinating frontline workers within the NHS. In 2013–2014 the target that NHS Trusts needed to meet was increased to 75% and the author’s Trust at this time had an uptake of 44%.

Methods and measurement
The service improvement to increase uptake of the influenza vaccine had a number of components, which included a multidisciplinary team approach, education, launch events, offering vaccines at meetings and training, and social media. The infection prevention team and employee health and wellbeing teams worked collaboratively throughout the campaign as the “flu fighter team”. Education was provided prior to the campaign commencing, with all teams who had a poor uptake being invited to a presentation on influenza which included how it is spread, signs and symptoms, risk groups and examples of outbreaks in the local area.

The campaign was launched with events at different venues across the Trust, with staff members being invited to have their vaccine, then enjoy a slice of homemade cake. Social media was used to support the campaign, with staff members having their photos taken holding a banner saying “we’ve had our flu jab have you had yours?” These were shared on social media and got staff members talking about having the flu jab.

Evidence of improvement
The Trust has increased the uptake from 44% to 77% and has been the top performers during in-ward use.

Future steps
Future steps should involve the further development of the educational element prior to commencing vaccinating staff members, in particular targeting areas with lower uptake figures.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4627
Improvements in the use of personal protective equipment in Japanese dental facilities after infection control seminar participation
Keiko Okamori, Mayumi Aminaka, Hiroko Inda, Hitomi Kurosu, Kazuyo Ono, Chie Shibuya, Masako Uchiyama
Healthcare Associated Infection Control Support Institute

Introduction
In dental settings where the risk of cross-contamination and occupational infection is high, adequate use of personal protective equipment (PPE) is important. We held a series of infection control seminars for dental healthcare personnel and conducted a survey of the participants after the seminar. We report the current status of the use of PPE in Japanese dental facilities and the improvements reported after seminar participation.

Methods
A self-administered questionnaire was mailed to the 181 dental facilities who attended our infection control seminar.

Results
We received a total of 74 responses (response rate 40.9%), of which 39 (52.7%) were from dentists, 24 (32.4%) from dental hygienists, 10 (13.5%) from dental assistants, and one (1.4%) from a pharmacist. A total of 43 facilities (69.6%) had been actively using PPE before attending our seminar. However, 49 facilities (66.2%) changed and/or increased the use after seminar participation. A total of 29 facilities (39.2%) increased glove use, 15 facilities (20.3%) improved correct glove use, 13 facilities (17.6%) started to change gloves between each patient, 29 facilities (39.2%) increased eye protection use, and 10 facilities (13.5%) introduced eye protection. In addition, six facilities (8.1%) started to change protective clothing between each patient, and six facilities (8.1%) newly introduced protective clothing.

Discussion
Proper use of PPE is essential for infection control in dental settings. Although most dental facilities in Japan already comply with PPE, improvements were observed after participating in the infection control seminar. It was suggested that the seminar served as an effective learning opportunity for proper PPE use. We will continue to promote not only the necessity of PPE but also its correct use, which may contribute to improving infection control in dental settings.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4630
Descriptive study of vaccination programme for nursing students, healthcare workers and caregivers in A prefecture in Japan
Matsunaga Sanae, Professor Hanako Misao
Miyagi University

Background
The vaccination programmes of hepatitis B (HBV), hepatitis C (HCV), measles, mumps, varicella, and rubella (ID) for nursing students and healthcare-related workers (HCRW) including healthcare personnel and care workers have been varied, but not clarified. Therefore, the purpose of this study was to investigate the current vaccination programmes for HCRW in A prefecture in Japan.

Methods
After approval from the ethical committee of the institution to which the first author belonged, an anonymous self-reported questionnaire about vaccination programmes and their expense was distributed to the following institutions: 305 healthcare facilities, clinics, visit nursing stations, long-term care facilities, and public health centres which were randomly selected, and 14 nursing schools in A prefecture in Japan.

Results
The response rate was 30.7%. Of nursing schools, 86% conducted HBV, HCV, and the above ID antibody titre tests. Also, about 60% of the nursing school carried out a tuberculin reaction test.

Among the healthcare facilities, all employees had to take the HBV antibody titre tests, and 19.2% of them carried out an HIV antibody titre test. Approximately 50% of them carried out the above ID antibody tests.

Although visiting nursing stations, long-term care facilities, clinics, and public health centres carried out HBV antibody titre tests and its vaccinations, the above four IDs antibody titre tests as well as TB screening tests were not conducted.

The cost of antibody titre tests were paid by 75% of nursing schools. The cost of vaccination of HBV and HCV and the above ID antibody titre tests were paid by 87.5% of nursing schools.

Discussion
This systematic process has established proof of concept for the tool. A stage 4 prototype is now being developed with the intention of trialing by IPC managers during in-ward use.

Declaration of interest
I do not have any conflict of interests to declare.
Conclusion
The percentage of nursing schools that performed the vaccination programme was fairly high; however, the percentages for other healthcare-related facilities were low.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4633
ApProPriatE: Developing a personal protective equipment tool
Carly Baker, Carolyn Dawson, Kate Prevc, Allison Bradley, Melanie Gallo, Fiona Wells, Merja Thomas, Nicola Chamberlain, Darren Wheldon, James Parr, Emily Connor
University Hospitals Coventry and Warwickshire NHS Trust

Improvement issue and context
As one of the largest teaching hospitals in the UK, our Trust’s Infection Prevention and Control Team (IPCT) receives large numbers of calls each week surrounding personal protective equipment (PPE). Despite an isolation guideline outlining PPE use, there appears to be confusion from medical and nursing teams around what PPE to wear for certain infectious pathogens and for how long. Research from across the globe indicates this confusion is not a local issue.

Methods and measurement
The IPCT recognised the need for a tool to aid staff to learn, remember and recall PPE information. It was decided a visual tool should be created, that could be used as reference, but also a learning method. The PPE wheel was born.

The wheel is broken into four sections based on the transmission routes of the pathogens (droplet, contact, airborne, and faecal–oral). Each section is broken down into what PPE should be worn. In line with epic3 guidance, correct removal of PPE is included due to contamination risks upon removal.

Focus groups using patient care scenarios conducted across 10 units have established current levels of knowledge and confidence surrounding PPE use. These confirm the need for a tool, with widely varying confidence levels across the Trust (range: 0–80%). Knowledge of PPE was particularly poor when respiratory conditions were involved.

Evidence of improvement and future steps
The tool was previewed at our 2016 IPC link staff study day. Staff felt the tool was potentially useful, and multiple requests for the finished tool were received. Final prototype development is scheduled for completion by December 2016 and the tool will be disseminated within the Trust during 2017. Evaluation of its efficacy in helping staff learn about PPE will be conducted via repeat focus groups at 3, 6, and 12 months after launch.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4641
Preventing infection workbook for domiciliary care
Mrs Gill Johnson, Mrs Sonya Ashworth, Mrs Jane Cozens, Mrs Helen Degnan, Mrs Anna Padget, Mrs Jill Roe, Mrs Bev Smalls, Mrs Kath Banfield
Harrogate and District NHS Foundation Trust

Improvement issue and context
Provision of infection prevention and control (IPC) training for domiciliary care workers can be challenging. This group of staff are mobile workers with little or no access to electronic training or IPC resources during their working day.

Methods and measurement
To support the domiciliary care sector and their care workers with an easy access source of IPC education and information, we have developed an infection prevention workbook containing guidance for staff providing care at home. This follows on from the successful workbooks developed for Community Health and Social Care and General Practice.

This innovative 68-page workbook is A5 size, is suitable for a wide range of staff who provide care at home to service users, such as domiciliary and rehabilitation teams undertaking personal care or who assist with daily living activities. It is designed for all levels of staff and each member of staff should receive their own copy, working through at their own pace.

It provides latest national guidance, evidence-based information, 16 topics including seven standard precautions, four key topics and five specific infections. Each section includes “test your knowledge” questions. When 100% competence is achieved, managers sign the “Certificate of Completion”, providing evidence for registration requirements. Staff should keep the workbook as evidence of learning and a reference guide for day-to-day working.

Evidence of improvement
The workbook, published in March 2016, is now used locally and nationally. Positive feedback includes:

“The workbook is a brilliant resource and staff are lucky you are there to support them. Completion of the workbook would be an ideal way for Domiciliary Care agencies to demonstrate staff training”

“The workbook is excellent and a good source of information for our Support Workers”.

Future steps
Future steps should include raising awareness of the workbook with key stakeholders in public and private sectors.

Declaration of interest
I do not have any conflict of interests to declare.
Epidemiology and surveillance of HCAI

Abstract ID: 4441
A prospective cohort study of the incidence of vascular surgical site infection using dalykylcarbamoyl chloride-coated postoperative dressings

Nelson Bua, Mr George Smith, Dr Daniel Pan, Dr Tamsin Nash, Professor Ian Smith
Hull Royal Infirmary, Hull, UK

Introduction
Surgical site infection (SSI) rates are particularly high (up to 20%) in vascular surgery patients, reflecting the significant co-morbidities in this group. Dressings coated with highly hydrophilic Dialkylcarbamoyl chloride (DACC) irreversibly bind multiple types of bacteria and should prevent their ingress into wounds. We aimed to determine if the use of coated postoperative dressings could reduce SSIs in non-implant vascular surgery.

Methods
Between August 2015 and February 2016, we followed 100 consecutive patients before and 100 after the introduction of DACC-coated postoperative dressings for surgical sites at a single vascular centre. Wounds were reviewed at day 5 and day 30 according to the ASEPSIS score to determine the presence of SSI. Dichotomous outcomes of SSI versus no SSI were assessed using a two tailed Chi-squared test with Yates correction.

Results
The 200 patients included 120 males with mean age 63 (range 27–97) including 184/200 current or ex-smokers and 91/200 diabetics. SSI at 5 days was significantly lower in the DACC-coated dressings’ group compared with standard dressings (1/100 versus 10/100: p = 0.01). Subsequent SSI rate from 5 to 30 days between DACC and standard dressings was not significantly different (9/99 versus 9/90: p = 0.85).

Conclusions
DACC-coated dressings showed a significant reduction in SSI rates at 5 days post procedure (p<0.01). No statistically significant difference in SSI was seen beyond 5 days post procedure. DACC-coated dressings appear to have value in SSI prophylaxis in this patient group and would warrant further investigation.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4447
Multidrug-resistant Gram-negative bacterial isolates causing nosocomial pneumonia in a tertiary care hospital, Nepal

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Introduction
Nosocomial infection is becoming a leading problem for medical practitioners nowadays, placing an extra burden on individual patients worldwide. Nosocomial pneumonia caused by multidrug-resistant (MDR) pathogens is a major threat in intensive care unit patients in developing countries, with increasing numbers in Nepal. The aim of this study was to determine the aetiology of nosocomial pneumonia caused by MDR Gram-negative bacterial isolates.

Methods
A total of 100 Gram-negative bacterial strains isolated from patients diagnosed with nosocomial pneumonia were studied during 2011 and 2012 at Tribhuvan University Teaching Hospital (TUTH). Antibiotic sensitivity was determined using a modified Kirby Bauer Disc Diffusion method as described by the Clinical and Laboratory Standards Institute (CLSI).

Results
Nosocomial pneumonia caused by the Acinetobacter calcoaceticus baumannii (Acb) complex was found to be predominant (36%), followed by Klebsiella pneumoniae (28%) and Pseudomonas aeruginosa (17%). Of the total isolates, 87% were MDR, which was much higher in Acb complex and Escherichia coli (100% each).

Discussion
The emergence of MDR bacterial strains causing nosocomial pneumonia is increasing. The high prevalence of MDR has demanded special attention for the management of such patients and prevention of dissemination of such strains into hospitals.

Declaration of interest
I do not have any conflict of interests to declare.
Abstract ID: 4541

An increase in numbers of glycopeptide (vancomycin)-resistant Enterococcus: A new unexplained trend?

Marietta Niala, Dr Rohinton Mulla, Sue Fox
Luton and Dunstable University Hospital

Introduction
Enterococci are Gram-positive bacteria that commonly live in the bowel and occasionally colonise or infect the urinary tract. When spread occurs beyond the gut they can be responsible for other serious infections like endocarditis. Environmental contamination with enterococci can occur and become a source of infection to other patients. Enterococci are often sensitive to beta-lactam antibiotics like amoxicillin, glycopeptides (vancomycin, teicoplanin), linezolid, tigecycline and daptomycin.

In the last 3 years there has been an unexplained increase in beta-lactam and glycopeptide resistance in our hospital. In 2011–2013, there were 26 glycopeptide-resistant Enterococcus (GRE) cases while in 2014–2015, there were 60 GRE cases.

Methods
A retrospective analysis of clinical results from January 2011–December 2015 was performed. A review of patient notes was undertaken for cases in the last 2 years to identify contributory factors.

Results
We identified 12 GRE cases in 2011, six in 2012 and eight in 2013 (26 GRE cases in 3 years). In 2014 and 2015 there were 19 and 41 cases of GRE. The majority of the samples, 57 out of 86 samples, were from urine, while 14 of them were from blood culture, and other samples were from wound swabs, faeces and other sites. From October 2014 onwards, a total of 65 isolates were sent for PFGE typing and results revealed several “clusters”. The most common type was labelled LUTOPEC 5 (16/56).

Discussion
Following a review of patients’ notes from the last 2 years, most of the patients identified have acquired the GRE within 48 hours of hospital admission. The majority of specimens were from urine. Twelve patients had been treated with a glycopeptide (teicoplanin or vancomycin) before GRE was identified. Other risk factors were also analysed. A risk-based screening process may be required locally to limit further spread of this organism.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4570

Implementing effective surgical site infection surveillance 2012–2015

Kim Corbett, Jodie Winfield, Vanessa Whatley, Dr Mike Cooper, Claire Hayward, James Parr, Lateef Olayanju, Adam Bernard, Dawn Newman, Chrisda Davis
Royal Wolverhampton NHS Trust

Introduction
This poster will demonstrate the reduction of surgical site infection (SSI) by the implementation of a dedicated SSI Surveillance Team (SSIST) into a large acute NHS Trust in 2012.

The NHS performed 9.920 million surgical procedures in 2014/2015 (most recent HES data), many posing a risk of SSI which remains largely unquantified. Published evidence is that SSI accounts for 16% of all healthcare-associated infection and remains a significant clinical and costly control.

Methods
The team monitors patients who have had knife-to-skin procedures (6195 patients in 2014/2015). Telephone questionnaires are completed at 30 days and the surveillance continues at 3 months, 6 months and 12 months if implants have been used.

An electronic surveillance system (ICNet) is used to identify patients who are included in the surveillance and any subsequent admissions. Each SSI is categorised according to the published definition set by the Centre for Disease Control (CDC). Data is banded into four groups: patient reported only; post discharge (confirmed); readmission and inpatient. Risk factors are collected; however, these are reported on in response to specific enquiries or variances in data.

Anonymised feedback is provided to surgeons monthly via a data dashboard to allow a wider discussion within the Trust and to enable surgical colleagues to review their own data.

Results
Confirmed infection rates reduced from 10% to 2.6%. In the initial period, savings were gained in bed days saved, reduced readmissions and theatre time through a decrease in patients requiring reoperation due to SSI. The reduction in SSI has continued across specialties. The average follow-up rate is 58%.

Discussion
Continuous all-specialty SSI data provides a measure of continuous quality improvement at relatively low investment. The benefits should be discussed in the context of the wider NHS.

Declaration of interest
I do not have any conflict of interests to declare.
Abstract ID: 4574
Theme analysis: Trust-appointoned Clostridium difficile
Ashley Flores, Dr Karen Knox
Surrey & Sussex Healthcare NHS Trust

Introduction
During the financial year 2015–2016 there were 34 Trust-appointoned cases of Clostridium difficile at Surrey & Sussex Healthcare NHS Trust.

Methods
A root cause analysis (RCA) investigation was carried out for each case, including a review with the commissioners to assess whether there have been any “lapses in care”. An RCA theme analysis was carried out, in order to identify lessons learned.

Results and discussion
Each RCA action plan is followed up and signed off by the relevant Division, and lessons learned are disseminated within the division and across the Trust. The main themes from the RCA investigations are:

1. Lack of diarrhoeal risk assessment and MDT review and documentation of this
2. Missed opportunity/delay to sample sending
3. Delay to patient isolation (requirement for complex patient transfer(s) to available single room)
4. Testing delay, e.g. unlabelled sample
5. Delay to commencement of CDI treatment
6. Prescription errors (inappropriate route of administration; incorrect dose interval; incorrect dose; unsigned dose)

In order to address the lessons learned, a number of initiatives have been put in place. These include:

- A “Stop Assess Send” campaign to increase awareness of the importance of prompt stool and isolation
- The management of diarrhoea is included in the quality improvement “Virginia Mason” programme
- Programme of education in the SIM lab, designed and run by the IPCAS team
- Algorithm for the clinical assessment of diarrhoea
- Increased presence of IPCNs on the ward to facilitate review of diarrhoea and cases of Clostridium difficile
- Maintenance of isolation of patients with toxigenic strains for duration of inpatient stay (regardless of symptoms)

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4580
Interdisciplinary approach to healthcare-associated infections surveillance in Japan
Mayumi Aminaka1, Keiko Okamori2, Kiyomi Hosoda3, Naoko Konishi4, Chie Shibuya4, Hisami Tanimura4, Atsuko Tsutsui5, Yumiko Zamma6, Kunikazu Yaman6, Satowa Suzuki5
1National College of Nursing, Japan, 2Seikai Medical Treatment Corporation Headquarters, 3Fukuiken Saiseikai Hospital, 4Japanese Nursing Association, 5HAICS Okinawa, 6National Institute of Infectious Diseases, 7Saka General Hospital, 8Yonago Medical Center

Introduction
Japan Nosocomial Infections Surveillance (JANIS) is a voluntary national surveillance with more than 1800 participating hospitals. In Japan, where hospital epidemiologists are not common, surveillance is usually a part of an infection control practitioner’s multiple, diverse responsibilities. However, the rate of data submission to JANIS is quite high (>95%) and the dropout rate is low (<3%). Here we investigate which types of professionals are involved in JANIS.

Methods
We conducted on-site structured interviews using a questionnaire developed by a working group of infection control practitioners. Hospitals were chosen from JANIS member hospitals that participate in both the surgical site infection (SSI) and antimicrobial-resistant bacterial infection (ARBI) divisions.

Results
A total of 20 hospitals in seven areas of Japan with beds counts ranging from 80 to 1063 (median, 355.5) were visited. More than two types of professionals are conducting surveillance at 13 (65%) and 17 (85%) hospitals for SSIs and ARBIs surveillance, respectively. The most prevalent profession in charge of SSI surveillance was nurse (90%), followed by medical doctor (60%) and clerk (30%). For the ARBI surveillance, they were nurse (90%), clinical microbiologist (75%), and medical doctor (60%). There was no association between hospital size (bed count) and whether the surveillance involved multiple professions or not (SSI division, 397 beds vs. 299 beds, p=0.57; ARBI division, 380 beds vs. 468.5 beds, p=0.84).

Discussion
Most Japanese hospitals are conducting surveillance with multiple professionals that are keen to share data, regardless of hospital size. Although nurses and medical doctors play key roles, the workload for surveillance was shared with other professionals, which resulted in high sustainability. This interdisciplinary approach to surveillance may help improve infection control practices in all professions and departments.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4590
Reducing CDI below the irreducible minimum: A multi-faceted approach
Joanne Ellison
Walsall Healthcare NHS Trust

Service improvement
Improvement issue and context
In April 2007 the Department of Health introduced targets to NHS Acute Trusts to focus reduction of Clostridium difficile (CDI) toxin-positive cases. C. difficile is the major cause of infective hospital-acquired diarrhoea in the UK, and has been associated with more than 16,000 cases per year in England and Wales. The targets look to reduce only the toxin-positive cases once patients are already symptomatic, but prior to this is improving the quality and safety of care by preventing colonisation from occurring in the first place. Colonisation can occur in one of three ways: contact with a healthcare worker; contact with a contaminated environment and from direct contact with a patient with C. difficile infection.

The aim of this work is not to look at the treatment of C. difficile infection, but to explain the measures used to prevent colonisation in the first place.

Methods and measurement
A multi-faceted approach has looked at daily side-room utilisation, isolation on diarrhoeal symptoms not results, standard precautions, environmental decontamination, 30-day health economy-wide patient review and self-directed staff learning packs. For each intervention, PDSA cycles have been used to evaluate and then disseminate interventions across the organisation.

Evidence of improvement
The work has resulted in year-on-year reductions over the last 3 years, with results of 33 cases, then 16 and, for 2015/2016, seven cases against a target of 18. This has been identified by the Trust Improvement agency as exemplary and our approach is discussed to provide ideas for other organisations.

Future steps
We aim to not become complacent with the results and undertake systematic review of the evidence to ensure current practice is the best, to continue to use the PDSA cycle to implement new ideas and to publish.

Declaration of interest
I do not have any conflict of interests to declare.
Abstract ID: 4606

Analysing the effect of skin prep solution on surgical site infections in cardiac surgery

Melissa Rochon¹, Ellie Wishart², Carlos Morais¹
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Introduction
Royal Brompton & Harefield NHS Foundation Trust utilises a predictive surgical site infection (SSI) score, the Brompton Harefield Infection Score (BHIS), for patients undergoing coronary artery bypass graft (CABG) surgery. In 2015, analysis of over 4000 cases and 42 variables was performed, whilst also determining the impact of interventions to prevent SSSs. The study found no significant difference between skin prep solutions based on either chlorhexidine (CHG) 2% in 70% alcohol or povidone iodine (PVI) 10%. In this additional study, a separate analysis of over 4000 cases and 42 variables was performed, whilst also determining independent variables of skin preparation and SSI risk category.

Methods
This research involved continuous, prospective surveillance on 2375 cases. It included 75 SSIs from January 2013–October 2015 (primary or re-admission), while simultaneously, data was collected for theatre skin prep solutions and BHIS risk group.

Results
The results indicate:
- The overall model and skin prep solution were statistically significant (LR chi²=56.0715, p=<0.001) and (LR chi²=0.0011)
- No statistically significant effect of the interaction between SSI risk using BHIS and the skin prep preparation

Discussion
Recommendations arising from the Darouiche et al (2010) publication were quickly incorporated into surgical guidelines, including the DoH care bundle programme. Similar to the 2015 BHIS analysis, this study finds no statistical difference between solutions used.

Although not RCT-level evidence, this study is relevant to our cardiac patient group. The application of the skin prep products is carried out in a consistent manner, with attention to application technique, drying time, etc. Our findings suggest that PVI 10% and CHG 2% products in alcohol are equally efficacious and safe in this patient group. This work can provide assurance to commissioners of the best available evidence for practice.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4611

Setting up line surveillance to drive improvement

Carole Hallam
Calderdale and Huddersfield NHS Foundation Trust

Improvement issue and context
Central venous catheter-related blood stream infections (CRBSI) cause increased mortality and morbidity in patients; many of these are preventable using evidenced-based care. Matching Michigan is a national project focused on critical care units to reduce central line infection rates using a quality improvement programme. Following improvements in critical care, it was agreed that the principles should be adopted across the whole hospital, ensuring that all patients with central venous access devices (CVAD) received safe and effective care.

Methods and measurement
A CVAD Steering Group was set up to bring together all key stakeholders involved in the care of CVAD, including a lead clinician to oversee best clinical practice. It was important from the outset to establish an outcome measure to demonstrate improvements in practice, with the obvious measure being CRBSI. Potential CRBSI were identified by the microbiologists (numerator) and a process to collect the number of line days (denominator). All cases of CRBSI are investigated using root cause analysis (RCA) and the learning shared with the Steering Group to action changes to practice.

Evidence of improvement
During the last 5 years, learning from CRBSI has allowed improvements to practice including standardised care pathways, training and competency framework, routine MSSA and MRSA screening and a change to chlorhexidine island dressings. Evidence of the improvement is seen in the surveillance data with the rate of CRBSI falling from 5/1000 line days in 2011 to 0.6/1000 line days.

Future steps
We are able to monitor the rate of CRBSI for each department with patients with CVAD and we can accurately assess problems and spot trends at an early stage to implement effective change as required. Further work includes the development of a patient-held record and training package for patients in the community with their CVAD in place.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4613

Building works danger on the ward: Works can release high numbers of concentrated organisms!

Amy Mbuli
University Hospitals of Morecambe Bay NHS Foundation Trust

Improvement issue and context
To keep the buildings in good physical condition means hospital renovation, and it has been proven that hospital-acquired infections occur in higher numbers when hospital renovations are taking place (Pini et al, 2007); this includes major and minor works (Chang et al, 2008). Ross et al (2011) state that renovation should be delayed until patients have been moved to an alternative setting; however, this is not always possible and many works are necessary and must be done whilst patients are in situ. When emergency renovation is required then the patients may not be able to be moved, but Ross et al (2011) go on to discuss that measures can be put in place to minimise the risk to the patient.

The Trust’s “Better Care Together” strategy states that changes will have to be made to existing facilities to ensure they are appropriate for 21st century health care.

Methods and measurement
As part of the Infection Prevention (IP) annual plan, to maintain a clean and safe environment, the team will be involved in capital planning, supporting refurbishments and new builds. The IP team have worked closely with the estates team for IP training; we have invited external contractors to complete the same training focusing on the guidelines that HBN 00-09 (2013) sets out. We are working with the staff on the wards to understand the risks involved with works going on whilst patients are on the ward.

Evidence of improvement
We are undertaking environmental audits with the Infection Prevention Society environmental audits structure. Evidence of improvement is the reduction of Clostridium difficile figures shown in the DIPC annual report.
Future steps
We will continue to work with all staff that work within the hospital to ensure a clean and safe environment for our patients.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4616
Microbiological study of organisms (bacteria, fungi and parasites) causing vaginal discharge
Dr Achut Barakoti, Dr Ritu Amatya
Nepal Medical College and Teaching Hospital

Background
Vaginal discharge is one of the most common complaints seen in the gynaecology outpatient department (GOPD). Alteration in the balance of normal vaginal flora can lead to overgrowth of other organisms that causes abnormal vaginal discharge.

Method
One hundred and one patients attending the GOPD of Nepal Medical College and Teaching Hospital (NMCTH) between August 2011 and July 2013 with vaginal discharge were evaluated to determine microbiological aetiology. Three high vaginal swabs were taken from each patient who came to the outpatient department with complaint of vaginal discharge. These specimens were subjected to different microbiological evaluation using standard microbiological techniques.

Results
Of the total patients studied, the mean (SD) age was found to be 30.15 (6.93) years. Around 57% (57.42%) of women had vaginal discharge of infectious aetiology. The most prevalent disease was bacterial vaginosis (29.7%) followed by candidiasis (24.75%). Of the total candidal infections, 56% were caused by Candida albicans and the remaining by Candida glabrata, Candida tropicalis, Candida parapsilosis and Candida krusei. Trichomoniasis was among the least common cause of vaginal discharge (0.99%).

Conclusion
Our study concluded that the most common cause of vaginal discharge is bacterial vaginosis followed by candidiasis. Trichomoniasis was less prevalent in our part of the world. Although the syndromic approach for treatment of vaginal discharge is being followed, this study clearly depicted around 43% of those presenting with vaginal discharge had normal vaginal flora and were not in need of any treatment. Therefore, even if simple microbiological tests are employed in the final diagnosis of vaginal discharge, this would avoid unnecessary treatment and thus avoid the economical, social and psychological burden to the women in question, and also will avoid unnecessary exposure to drugs.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4617
Understanding the epidemiology of Clostridium difficile across North Wales: Outcomes of a whole-genome sequencing study
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1Betsi Cadwaladr University Health Board, 2Public Health Wales, 3Nuffield Department of Medicine, Oxford

Introduction
In 2013 the Betsi Cadwaladr University Health Board (BCUHB) had a large outbreak of Clostridium difficile infection (CDI), with background rates the highest in Wales. In response a range of actions were implemented. This included a collaborative study between BCUHB, Public Health Wales (PHW), and Nuffield Department of Medicine, Oxford, which used whole-genome sequencing in order to better understand the epidemiology of the CDI, and assist in targeting control measures.

Methods
A prospective cohort study of all laboratory-confirmed CDI cases between February and July 2015 was undertaken. Risk exposure data on cases, and organisational factors such as cleaning and staffing levels and both hospital and community antibiotic prescribing, were considered alongside phylogenetic information obtained by whole-genome sequencing. A comprehensive programme of stakeholder engagement was developed with the aim of using the information obtained to drive change. Tableau analytical software was used to aid visualisation of results.

Results and discussion
Phylogenetic analysis of 76% of toxin-positive and 63% of toxin-negative CDI cases that were successfully sequenced indicated that the majority (75.9%) of CDI cases in North Wales were unrelated to others. The number of closely related cases was greater in samples from hospital settings than from the community. This implies that factors other than immediate healthcare environments are driving the number of cases in North Wales. Contextual data indicated considerable scope to improve both antibiotic stewardship and compliance with audits relevant to infection prevention. Visualisation of broad but relevant data using interactive analytical software has the potential to support the application of research findings to clinical and wider hospital practice. The process of stakeholder engagement to drive action in these areas will be discussed.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4618
Effectiveness of preoperative chlorhexidine bathing to reduce surgical site infections in intensive care unit patients who underwent cardiac surgery in Japan
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Introduction
Surgical site infection (SSI) among patients after cardiac surgery is a life-threatening complication. Some existing studies showed the effectiveness of daily chlorhexidine (CHG) bathing as a precaution to reduce bloodstream infections and SSIs. However, there is a lack of evidence of the effectiveness of daily CHG bathing among patients after cardiac surgery.

Objective
This study aimed to examine the effectiveness of preoperative CHG bathing on SSIs among patients undergoing urgent cardiac surgery, defined as patients who needed to enter ICU after admission and were scheduled for surgery within 72 hours.

Methods
We analysed patients with cardiovascular disease who underwent cardiac operations at our specialised hospital in Japan between 1 January 2014 and 30 April 2016. Preoperative CHG bathing was introduced from 1 January 2015 as a measure to prevent SSIs. We compared the data (such as demographic and laboratory data, treatment and drug used, and so on) with and without preoperative CHG bathing. SSI was defined using the CDC and National Healthcare Safety Network criteria. This study was approved by the Institutional Review Board of the hospital and Miyagi University in Japan.

Results
Among 35 patients undergoing urgent cardiac surgery, 20 patients received the preoperative CHG bathing (CHG group) and 15 did not (non-CHG group). Demographic characteristics were similar between the groups. The incidence rates of SSI for CHG and non-CHG groups were 5% and 26.7%, respectively (relative risk 0.145; confidence interval 0.014–1.464; p=0.141). There was no statistically significant difference on SSI rates between the two groups; however, the incidence rate of the CHG group was decreased compared with the rate of the non-CHG group.
Conclusion
Although some limitations of this study were identified, CHG bathing may be an effective measure to decrease SSI among patients needing urgent cardiac surgery.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4626
Device-associated infections surveillance project among neonatal intensive care units by the Japanese Society for Infection Prevention and Control: Data summary during the first year

Haruyo Sakaki1, Yaoko Takano2, Tokiko Watanabe3, Retsu Fujita4, Hitomi Kurosu5, Ryoko Shibatani6, Fumie Sakamoto7, Keita Morikane8, Yasushi Harihara9
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Introduction
The Japanese Society for Infection Prevention and Control launched the device-associated infection surveillance project in neonatal intensive care units (NICUs). The purpose of this study was to evaluate the results and to explain our surveillance system during the first year.

Methods
This study was conducted from 1 January to 31 December 2015. Two types of device-associated infections in NICUs were selected to be surveyed: central line-associated bloodstream infection (CLABSI) and ventilator-associated pneumonia (VAP). In this surveillance, the protocol was based on the National Healthcare Safety Network (NHSN) surveillance system and used standard infection definitions from the Centers for Disease Control and Prevention (CDC) for international comparison. We used the clinical sepsis (CSEP) criteria for CLABSI in addition, to reduce the underestimation of CLABSI rate. NICU locations were categorised into two types: level III or level II/III. The data were collected for each of five birth-weight categories (<750 g, 751–1000 g, 1001–1500 g, 1501–2500 g, and >2500 g) and were compared with NHSN data.

Results and discussion
A total of nine NICUs participated. Pooled mean incidence by birth-weight categories in level III was 3.4, 1.5, 0.0, 2.2, and 2.1 per 1000 central line days for CLABSI; 1.5, 0.0, 2.5, 2.6, and 2.5 per 1000 ventilator-days for VAP, respectively. Pooled mean incidence by birth-weight categories in level II/III was 17.7, 4.4, 4.0, 0.7, and 8.5 per 1000 central line days for CLABSI; 1.3, 0.0, 5.4, 5.3, and 9.8 per 1000 ventilator-days for VAP. There were 39 CLABSIIs, and 26 (66.7%) of them were identified by CSEP criteria. We have established the surveillance system of device-associated infections in the NICU. Incidence of CLABSI and VAP in this study was higher than that in NHSN.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4628
Quasi-randomised trial of silicone-based and silver-coated Foley catheters for the prevention of catheter-related complications in Japan

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Background
In Japan, the durations of indwelling urinary catheters have been reported as longer than those in other developed countries including the United States and England. Catheter-related complications (CRC) include catheter-associated urinary tract infections (CAUTI) and catheter obstruction (CO). Although CAUTI has been well investigated, there are a lack of studies about CO. Therefore, the purpose of this study was to examine the incidence rate and risk factors of CAUTI and CO among patients with silicon-based and silver-coated Foley catheters (FC).

Methods
After the approval of the ethical committee in Miyagi University, a quasi-randomised trial was conducted. Adult in-patients with a new indication of indwelling urinary catheter were grouped into silver-coated FC (silver group) or silicon-based FC (silicon group). Binary variables were analysed using a chi-square test, and quantitative variables were analysed with the Mann–Whitney U test.

Results
The results of 42 patients in the silver group and 16 patients in the silicon group were analysed. The mean durations of silver group and silicon group were 15.5 (SD 15.7) days and 18.3 (SD 17.9) days. The incidence rates of CRC were 4.8% (silver group) and 0% (silicon group) respectively (p=0.374). The incidence rates of CO were 28.6% (silver group) and 6.3% (silicon group) respectively (p=0.068). Female gender (p=0.005) and administration of antibiotics (p=0.005) were statistically significant factors for CO.

Conclusion
Although small sample size and non-equal numbers of both groups were the main limitations of this study, the type of FC could be a possible risk factor for CO. From the results of this study, CO happened more than CAUTI among inpatients with an indwelling urinary catheter. In addition, female gender is a risk factor for CO. Administration of antibiotics during indwelling FC showed a preventive effect on CO; however, this issue should be examined further.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4629
Device-associated infection surveillance project by the Japanese Society for Infection Prevention and Control: Data summary for 6 years

Retsu Fujita1, Yaoko Takano2, Tokiko Watanabe3, Haruyo Sakaki4, Hitomi Kurosu5, Ryoko Shibatani6, Fumie Sakamoto7, Keita Morikane8, Yasushi Harihara9
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Introduction
The Japanese Society for Infection Prevention and Control launched the device-associated infection surveillance project in 2009. This surveillance project is designed to provide the society members and medical institutions with information on the occurrence of device-associated infections in Japan, and to make an international comparison of surveillance data. The objective of this presentation is to explain our surveillance system and to evaluate the results of 6 years.

Methods
Three types of device-associated infections were selected to be surveyed: central line-associated bloodstream infection (CLABSI); catheter-associated urinary tract infection (CAUTI); and ventilator-associated pneumonia (VAP) in intensive care units. In this surveillance, definitions and methods for calculating the infection rate used are in line with those specified in the National Healthcare Safety Network (NHSN) manual, in order to compare and analyse nationwide surveillance data from the United States and Europe. In terms of comparison with NHSN data from 2013, “medical-surgical ICU less than 15 beds” was selected for similar patient background.
Results
As of March 2015, a total of 108 institutions participated. The pooled mean BSI rate per 1000 device-days was 1.7, with a median value of 2.2 (NHSN, pooled mean: 0.8, median value: 0). The pooled mean CAUTI rate was 1.5, median value was 1.2 (NHSN, pooled mean: 1.3, median value: 0.4). The pooled mean VAP rate was 3.7, median value was 3.4 (NHSN, pooled mean: 1.1, median value: 0).

Conclusions
Infection rate for VAP was remarkably high in comparison with NHSN data from 2013. Future issues to be addressed are: to assess the validity of the NHSN’s diagnostic definition in Japan; to examine the cause of the high rate of VAP; to commence the VAE surveillance.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4651
Measuring and improving compliance with risk factor-based CPE admission screening
Siddharth Mookerjee, Kate Martin, Itziar Atucha-Zambrano, Nadine Corbin, Tracey Gallyet, Alison Holmes, Jonathan Otter, Kathleen Banford
Imperial College NHS Healthcare Trust

Introduction
Screening for carriage of carbapenemase-producing Enterobacteriaceae (CPE) is an important measure in preventing in-hospital transmission. We implemented risk factor-based CPE admission screening in June 2015, using a modified version of the CPE Toolkit. Risk factors that trigger screening are overnight hospitalisation in the previous 12 months, and overseas residence. Implementing CPE risk factor assessment and screening into the admission pathway has proved challenging operationally.

Methods
A private patients ward in an acute NHS hospital Trust was selected for a quality improvement programme in collaboration with NHS Improvement to improve compliance with CPE admission screening. A measure of CPE screening compliance was calculated by determining the number of admissions with overnight hospitalisation in our Trust in the past 12 months (denominator) and the number of patients who were screened within 24 hours of admission (the numerator).

The intervention to improve compliance began in April 2016 and included a range of measures involving staff and patient education, information and investigation of barriers co-developed with the ward team. The rate of CPE screening was compared using a Fisher’s Exact Test for June 2015–March 2016 (pre-intervention) and April–mid-June 2016 (intervention).

Results
In total, 150 patients with overnight hospitalisation in the Trust were admitted to the private patients ward between June 2015 and mid-June 2016. Of 126 admissions, 71 (56%) were screened within 24 hours pre-intervention compared with 21 (88%) of 24 admissions during the intervention (p<0.05).

Discussion
An intervention based on raising staff and patient awareness of the need for risk factor-based CPE screening significantly increased compliance in a private patients ward. Identifying patients colonised with CPE is vital for preventing “silent transmission” of CPE. We plan to extend this successful intervention across all private patients wards, and then across the Trust to improve compliance with CPE admission screening.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4655
A case of congenital rubella syndrome and infection in South East London in 2015: Implications for infection control and the public health response
Elizabeth Marchant1, Ms Louise Bishop1, Mrs Debbie Flaxman2, Mrs Jenni Jagodzińska2, Dr Mahesh Nanjundapp2, Dr Prasanna Muniyappa2, Dr Rebecca Cordery1
1Public Health England, 2Lewisham and Greenwich NHS Trust

Introduction
In 2015, the South East London Health Protection Team was notified of a case of rubella infection and suspected CRS in a 17-day-old infant. We describe the risk assessment and infection control measures, as well as considerations relating to the cessation of rubella susceptibility screening in pregnancy.
Risk assessment and infection control measures

The risk assessment considered patients, staff and visitors in the delivery suite and NICU. Ninety-six staff were identified as involved in the birth or care of the baby and required follow-up by Occupational Health.

Standard infection control precautions including hand hygiene and use of PPE were assessed as sufficient. The baby was isolated in a side room and was cared for by staff with documented immunity.

Infants with CRS can continue to excrete virus for more than a year, and therefore a weekly oral fluid sample was arranged to monitor duration of virus excretion as a marker of infectiousness.

Recommendations

A number of lessons learnt are highlighted, including a reminder of the importance of the MMR vaccine for all women of child-bearing age, in particular those arriving in the UK as children or young adults; of asking about history of rash in early pregnancy; the early consideration of CRS in infants with congenital abnormalities; and the importance of consistent staff MMR vaccination policies in healthcare organisations.

In April 2016, rubella susceptibility screening in pregnancy ended. This further highlights the importance of asking about history of rash in pregnancy and considering rubella as a possible cause of intrauterine growth restriction.

Declaration of interest

I do not have any conflict of interests to declare.

Abstract ID: 4657

Embracing technology to improve patient safety and experience: Surgical site infection surveillance at Guy’s & St Thomas’

Lilian Chiwera, Dr Neil Wigglesworth
Guy’s & St Thomas’ NHS Foundation Trust

Improvement issue and context

Limited voluntary surgical site infection surveillance (SSIS) is currently undertaken in England since data collection is considered resource intensive. Guy’s & St Thomas’ NHS Foundation Trust introduced an ICNet SSI module to the organisation in 2012 to improve efficiency in infection control / SSI data collection, management and security. This would release more time for other patient safety activities. Organisations could take advantage of the “Safer hospitals safer wards technology fund” launched in May 2013 to introduce similar suitable IT systems.

Methods and measurement

After initial collaborative work to introduce an efficient IT system, data for eligible surgical patients is now selectively imported into ICNet. This system links up a Galaxy theatre management system and Patient Administration system to facilitate eligible patients to be accurately monitored for SSIs. This has facilitated our organisation to sustain surveillance of 12 specialties with a surveillance team of only three staff (1 × band 7 team leader and 2 × band 3 HCAs).

Evidence of improvement

Our surveillance has expanded from mandatory orthopaedic surveillance to effective continuous surveillance of 12 surgical specialties. The expansion could not have been achieved without an efficient IT data management system that eased the burden of data collection and gave us the following benefits:

- Stopped manual entries in Excel databases
- CSV exports to PHE
- Readmission alerts
- Positive wound swab results alerts
- Infection markers trends (WCC, CRP, etc.)
- Secure database
- Audit trail

We have reduced the number of non-communicating password-secured IT applications we used for our surveillance from six to two and released time for effective caesarean section post-discharge surveillance and for raising awareness on SSIS. Huge cost savings were realised through reduction of SSIs and not recruiting additional staff to sustain our surveillance.

Future steps

We are happy with our SSI module, which we modified to suit our needs. We are working hard to incorporate ASA scores in Galaxy to enable us to go “paperless”.

Declaration of interest

I do not have any conflict of interests to declare.

Abstract ID: 4666

Detecting and managing CPE outbreaks: Seek and you shall find

Tracey Galletly, Eimear Brannigan, Siddharth Mookerjee, Frances Davies, Alison Holmes, Jonathan Otter
Imperial College NHS Healthcare Trust

Introduction

Carbapenemase-producing Enterobacteriaceae (CPE) have begun to cause outbreaks in the UK. Risk factor-based screening of admissions for CPE was introduced in June 2015 to enhance universal screening of admissions to high-risk specialties. We explore whether increases in CPE screening resulted in the detection of further outbreaks.

Methods

From June 2015, our hospitals performed risk-factor-based CPE screening of all admissions, universal screening in high-risk specialties, weekly screening in wards where known carriers were present, and contact tracing around newly detected carriers. Each CPE case identified and confirmed by PCR locally was sent to the reference laboratory for VNTR genotyping. An outbreak was defined as two or more cases of CPE with the same VNTR type with epidemiological links. We report the number of outbreaks of CPE since implementing enhanced CPE screening in June 2015.

Results

The Trust experienced five separate outbreaks of CPE first identified in the 2015/2016 financial year: two K. pneumoniae NDM outbreaks (40 and four patients), two Klebsiella pneumoniae OXA-48 outbreaks (seven and seven patients), and a K. oxytoca GES-5 outbreak (14 patients). Of these patients, 55/72 (76%) were first identified by screening specimens. Only one CPE outbreak had been identified in the Trust previously (in 2013). Control measures included an emphasis on high-quality hand hygiene, cleaning of equipment and ward environment including hydrogen peroxide vapour (HPV) decontamination of patient rooms at the time of transfer or discharge of case patients, and continued screening. All outbreaks have been controlled.

Discussion

We believe that enhanced screening for CPE has resulted in the detection of CPE outbreaks that would otherwise have gone undetected. Controlling these outbreaks has led to several challenges, including compliance with admission screening, staff education, and limited single rooms. We expect to detect more outbreaks of CPE as our screening programme continues.

Declaration of interest

I do not have any conflict of interests to declare.

Abstract ID: 4674

Antimicrobial resistance in unnoticed Northern Cyprus: Emerging rate of nasal methicillin-resistant Staphylococcus aureus (MRSA) carriage in nurses

Mumtaz Guran, Cemil Hurturk, Yagmur Balkoglu, Asem Muhsen, Melis Ulusan, Zehra Boraci
Eastern Mediterranean University

Introduction

In this study, we aimed to investigate nasal methicillin-resistant Staphylococcus aureus (MRSA) carriage rates, risk factors and knowledge problems regarding nosocomial infections among nurses in Northern Cyprus.
Methods
In this cross-sectional study a stratified sampling method is used, and two state and two private hospitals were visited for data collection. Nasal samples were taken with swabbed liquid media and cultivated overnight. Cefoxitin (4 μg/ml) added Mueller Hinton Agar media and usual phenotypical tests were used to differentiate MRSA from other possible pathogens. Results were evaluated by using Fisher’s Exact Test in SPSS v19.0.

Results and discussion

<table>
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<th>MRSA carriage</th>
<th>Total</th>
<th>State hospitals</th>
<th>Private hospitals</th>
<th>General polyclinic services</th>
<th>Operation room personnel</th>
<th>Personnel working years (&gt;16)</th>
<th>Personnel working years (&lt;16)</th>
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<td>75%</td>
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<td>p: 0.045</td>
<td>p: 0.021</td>
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The rate for nasal MRSA carriage among nurses was one of the highest (57.7%) reported in nurses to date, as the rate of nasal MRSA carriage varies in a range of 3.2–10.5% in such countries. The high rate of MRSA carriage among nurses in North Cyprus should be urgently taken into account, as nurses are the most important route for MRSA transmission. Moreover, 67.9% of the nurses, of which 54.7% were identified as carriers, had no knowledge about MRSA. Nurses who stated that they have information about this problem were found to be carriers with a rate of 64% (p=0.43). The most important reason for this emerging rate of MRSA carriage is due to low knowledge among nurses about MRSA precautions and lack of infection control strategies. There was a significant increase of nasal MRSA carriage as nurses work and get older. Ongoing education in MRSA prevention should be provided to nurses, including an evaluation of sufficient knowledge and skills, to come to a better point.

Declaration of interest
I do not have any conflict of interests to declare.
Innovation and improvements in practice

Abstract ID: 4419
Changing knowledge and best practice to reduce breast surgical site infections: A service improvement project
Mel Burden, Judy Potter
Royal Devon & Exeter NHS Foundation Trust

Improvement issue and context
Surgical site infection (SSI) surveillance data for breast surgery during April–June 2014 confirmed an overall SSI rate of 7.0% and inpatient and readmission rate of 2.2%. National benchmarks were 4.4% and 1.0%, respectively. Notification received from Public Health England (PHE) suggested discussions with surgeons to agree actions to reduce the rate of SSIs. Results presented to the breast team were used to drive practice transformation through audit and observation, identifying areas of change to improve patient safety while providing foundations for an MSc thesis.

Methods and measurement
The Department of Health (DH), 2007 high-impact intervention care bundle along with National Institute of Clinical Excellence (NICE, 2013) Quality Standards and Clinical Guidelines were used to measure the implementation of key care elements known collectively to impact on SSI rates. The project presented opportunities to promote infection prevention while suggesting care improvement strategies and behaviour change in partnership with the breast team.

Evidence of improvement
The overall SSI rate reduced from 7% to 1.9%, with inpatient and readmission rates reducing from 2.2% to 0.7%. The Trust is now below National benchmarks of 4.2% and 0.9%, respectively. The enriched relationship between the infection control and breast surgery teams enabled collaborative working to challenge and improve clinical practice. Participating hospitals were contacted by PHE for contributions on how surveillance influenced practice and improved patient safety through behaviour change. The Trust submission was published in the PHE 2014/2015 annual report of infections in NHS hospitals in England.

Future steps
Future steps involve using the bundle approach to reduce SSIs in other specialties as standard practice, not just where a high incidence of SSI is recorded, while maintaining the change within breast surgery through further surveillance.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4443
Optimising the use of bladder ultrasound scanners to improve the quality and safety of patient care and reduce costs: An economic assessment
Dr Jacqui Prieto
University of Southampton

Improvement issue and context
Portable bladder ultrasound scanning offers a non-invasive, fast and painless method to measure urine volume in the bladder. As an alternative to bladder catheterisation, it has been shown to significantly reduce urinary tract infection (UTI) and increase patient comfort. However, its adoption has been slow and inconsistent.

Methods and measurement
A detailed, monetised case study was undertaken. Cost avoidance analysis was used to demonstrate avoided spend associated with bladder scanning. Data on actual use of scanners during a 1-month trust-wide audit was used to inform the assessment. The impact of scanning in both high and low-use environments was analysed. Cost consequence analysis was used to compare the existing approach to the management of bladder scanners, namely localised management by wards, with a centralised approach using the trust’s Medical Equipment Library (MEL).

Evidence of improvement
Avoided spend was estimated to be in the region of £1,226,822 per year. This did not include the cost of bacteraemia attributed to UTI, or benefits of using a scanner, such as avoidance of treatment delays and avoiding overnight stay in hospital. The set-up and running costs of a scanner were estimated to be met within 6 to 24 months, depending on usage, after which significant ongoing cost efficiencies would be realised over its 8–10-year lifespan. Management of the trust’s fleet of bladder scanners within the MEL was considered advantageous in order to create efficiencies within the system.
Future steps
Bladder scanners improve the quality and safety of patient care and reduce costs. This economic assessment has demonstrated the significant avoided spend associated with scanner use and identified the key benefits to patients, staff and the organisation as a whole. There is a compelling case for management of bladder scanners within a MEL to ensure resources are better allocated.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4455
Commissioning for Quality and Innovation (CQINN) project: Reducing catheter-associated urinary tract infections, can change be sustained?
Diane Holland, Lisa Bree, Rebecca Griffiths
Chesterfield Royal Foundation Trust, UK

The 2012-2013 data from the monthly national “Safety Thermometer” revealed catheter-associated urinary tract infection (CAUTI) rates were consistently double the national average.

The IP&C team completed a baseline audit in March 2013 to assess urinary catheter usage, management and associated infections within the trust. This audit captured 502 adult in-patients who were reviewed for catheter usage; of these, 23% (113) had a urethral catheter in situ, and 17% (18) of the catheterised patients developed a CAUTI. As a result of this audit, North Derbyshire CCG established a Commissioning for Quality and Innovation (CQINN) goal. The Trust formulated an action plan to achieve this goal using a multi-modal approach.

On 6th January 2015 the infection prevention and control team repeated the prevalence audit.

Audit results
Key findings:
- 526 adult in-patients were reviewed for catheter usage in the January 2015 audit.
- 16% had a urethral catheter in situ. Compared with the March 2013 audit, this shows a 30% reduction in urinary catheter usage.
- 5% of patients developed a CAUTI, which is a 71% reduction compared with 17% in March 2013.
- 70% of patients had a daily review by the nurse using the HOU DIDI protocol compared with only 4% pre-implementation of HOU DIDI.
- 34% of patients had their catheter secured compared with only 2% in March 2013.
- 2 litre night bag usage has fallen from 50% to 19%.
- In addition to this, since August 2014 there has been a sustained decrease in the number of hospital-acquired CAUTIs reported via the Trust’s “Safety Thermometer” data and this has been sustained.

The project has seen a significant decrease in harm to patients, reducing length of stay for this patient group, improved patient flow within the organisation, and equating to potential cost savings of approximately £38,578 for CRHFT in line with evidenced-based research.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4476
Commissioning for Quality and Innovation (CQINN) project 2013/2014: Reducing catheter-associated urinary tract infections (CAUTIs) at a District General Hospital
Diane Holland, Lisa Bree, Rebecca Griffiths
Chesterfield Royal Foundation Trust

In 2012/2013, data from the monthly national “Safety Thermometer” revealed catheter-associated urinary tract infection (CAUTI) rates were consistently double the national average. A baseline point prevalence audit was completed in March 2013 to assess urinary catheter usage, management and associated infections within the trust. This audit captured 502 adult in-patients who were reviewed for catheter usage; of these, 23% (113) had a urethral catheter in situ. 17% (18) of the catheterised patients developed a catheter-associated UTI.

Evidence of improvement
The project has reduced the number of C. difficile cases that have associated lapses in care whilst also recognising good practice. Over the last 3 years and through strengthening of the process, an increase in the number of non-sanctioned cases, i.e. no breaches in key policy identified, has risen from 17% in the pilot year to 50% in 2015/2016.

Future steps
The joined-up whole-economy approach will continue to be key in future developments and the aspiration to further reduce the number of sanctioned cases.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4467
Clostridium difficile – Embedding best practice so that no person is harmed by a preventable infection
Lynn Rodrigues, Belinda Sadler
Cambridgeshire and Peterborough CCG, UK

Improvement issue and context
Clostridium difficile can be limited through combinations of good practice and adherence to key policies. Root cause analysis (RCA) is used to examine the patient pathway with the intent of identifying lapses in care in the prevention, treatment and management of the disease. National guidance has focused on taking this a step further using a post-infection review (PIR) process. As nurses within the CCG, we have supported our providers to maximise the benefits of PIR and prevent avoidable infection.

Methods and measurement
A pilot project set up by NHS England (East) in 2013/2014 was based on a modified PIR used nationally for MRSA bacteraemia. Using this template, scrutiny of each individual patient care pathway is enabled for C. difficile cases following the initial RCA. All levels of care staff are engaged in the process. Providers are supported to embed best practice across their organisations and gain high profile at Board level. An agreed local Healthcare-Associated Infection (HCAI) Strategy focuses on the patient experience and recognises good practice by following national guidance to reach the irreducible minimum through non-sanctioned cases.

Evidence of improvement
The project has reduced the number of C. difficile cases that have associated lapses in care whilst also recognising good practice. Over the last 3 years and through strengthening of the process, an increase in the number of non-sanctioned cases, i.e. no breaches in key policy identified, has risen from 17% in the pilot year to 50% in 2015/2016.

Future steps
The joined-up whole-economy approach will continue to be key in future developments and the aspiration to further reduce the number of sanctioned cases.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4457
Improvement of patient flow within the organisation as a whole. There is a compelling case for management of bladder scanners within a MEL to ensure resources are better allocated.
This paper explores the methodology used to create and sustain a change in practice when commissioners and providers utilise CQINNS to support and promote best practice and reduce harm.

**Declaration of interest**
I do not have any conflict of interests to declare.

**Abstract ID: 4481**

**Point prevalence survey of asymptomatic Clostridium difficile in a Community Foundation Trust**

Kath Hughes, Mrs Mandy Brailey, Mrs Lynn Whitehouse  
**Birmingham Community Healthcare NHS Foundation Trust**

There has been a plethora of research studies approximating the morbidity and mortality of patients with *Clostridium difficile* infection (CDI). As infection and prevention nurses, we wanted to investigate how to prevent transmission of CDI in the patient areas to prevent further harm to others from asymptomatic carriers, cross-infection, contamination from fomites, staff hands and the equipment they use. Following a CDI outbreak, a research forum was assembled and a research question hypothesised to identify asymptomatic carriage. The forum, Patient and Public Involvement, aimed to explain the study and how the survey would be conducted. The proposed survey was taken forward to the Ethics Committee for approval, who agreed it could go ahead.

All 11 adult hospital inpatient wards (seven) and inpatient units (four) were included in the study;

- The study took place over the winter 2015–2016;
- There were a total of 407 patient samples collected;
- 154 faeces samples were analysed;
- 253 skin swabs were collected and analysed;
- A total of 22 faecal samples were found to be positive for *Clostridium difficile* asymptomatic colonisation;
- 0 (n0) skin swabs were shown not to have any carriage;

These results show a prevalence of 14.3% asymptomatic positivity for *Clostridium difficile* asymptomatic colonisation;

- All positive asymptomatic carriers had received antimicrobials within the last 3 months;
- All positive asymptomatic carriers had received proton pump inhibitors within the last 3 months;
- All positive asymptomatic carriers had received care in an Acute Hospital within the last 3 months.

It was predicted that the rate of colonisation would be approximately 20%. The actual results were 14.3%.

Isolating identified asymptomatic carriers of as *C. difficile* potentially confines and prevents further contamination of the environment, and staff employing extra precautions concerned with source isolation protects other vulnerable patients in the vicinity.

**Declaration of interest**
I do not have any conflict of interests to declare.

**Abstract ID: 4482**

**Water Walk Arouneds – A systematic approach to water safety**

Sally Fletcher, Mrs Claire Haill, Dr Peter Jenks, Mr Phil Tarbuck, Mr Paul Commander  
**Plymouth Hospitals NHS Trust**

**Improvement issue and context**
Water is considered to be pure and clean. In reality it can be the perfect medium in which micro-organisms can grow. *Legionella, Pseudomonas Aeruginosa* and *Mycobacteria* have all been associated with hospital outbreaks linked to water.

Our Trust is a large tertiary hospital that is located within the South West Peninsula. Opened in 1981, it is a maze of corridors, wards and departments that have been configured numerous times to meet the changing needs of health care. This has led to a cat’s cradle of pipework, dead legs, sinks and outlets that present the perfect conditions for the creation of biofilms and the stagnation of water.

To reduce the risk of water contamination by micro-organisms, the Infection Prevention and Control team joined forces with Site Services to introduce the Water Walk Arouneds.

**Methods and measurements**
Every Friday at 10:30, the Infection Control Nurse Consultant and the Mechanical Services Manager rendezvous at a designated location, schematic drawings in hand. With the Ward Manager, all water outlets are examined for cleanliness, integrity and frequency of use. Actual locations of pipes and outlets are compared with those on the drawings. Clinical participation is essential. A snap shot of actual clinical practice is gained and all parties can raise concerns directly to those who can facilitate action.

Remedial works are instigated. Sinks no longer in use and discovered dead legs/ends are removed. Within the year, the whole hospital is reviewed in this way.

**Evidence of improvement**
Three hundred remedial works have been raised via this process. Water safety awareness has increased amongst Clinical Managerial staff. Schematic drawings are up to date and the Infection Control Team can give assurance to the Trust and the population it serves that a robust system for water safety is in place.

**Future steps**
This system is set to continue as it benefits all parties involved.

**Declaration of interest**
I do not have any conflict of interests to declare.

**Abstract ID: 4489**

**Enhanced observation project**

**Jill Wingham, Kizzie Hodgson**  
**South Tees NHS Hospital**

**Improvement issue and context**
The Infection Prevention and Control Team (IPCT) has developed an observation/training programme to provide increased support and on-going development to improve infection prevention control standards in the clinical area. The two assessment units – male and female – were identified as areas that would benefit from the training programme. The assessment units are very busy clinical areas that can have up to 60 admissions and discharges per day. The aim of the training programme was to increase visibility of the Infection Control Team, to improve infection control practice and identify any learning needs that the areas might need.

**Methods and measurements**
Two infection control nurses visited the Assessment Units daily and observed practice; they collected data such as time spent on discharge bed cleaning. To clean a discharge bed area thoroughly should take 20 minutes. With the discharges and transfers to other ward areas, it was calculated that up to 6 hours a day could be spent on cleaning discharge bed areas; sometimes, due to pressures on nursing staff, this did not always occur.

Medication Kardex were audited – the pharmacist had introduced a SPARED (Samples, Policy, Allergy, Reason, End date and Daily review) campaign for the use of antibiotics for doctors and non-medical prescribers and the ERA (End date, Reason and Allergy) for nurses – to see if the end date of antibiotics, reason and allergies were documented. The nurses also audited the Diarrhoea Assessment Tool to ensure that it was being utilised correctly and that the medics were aware of patients with suspected infectious diarrhoea.

**Evidence of improvement**
Following the project, the Trust introduced Environmental Support Workers (ESWs) to work in the Assessment Units; their role includes cleaning discharge bed areas, preparing beds for new admissions and transferring patients to the receiving wards. This allows nurses to care for their patients, and ensures that the bed areas are thoroughly cleaned ready for the next patient.

Based on the results from other audits, a “toolbox teaching” session on antibiotics, promoting the SPARED and ERA campaign, was devised and nurses were encouraged to sign up to be Antibiotic Guardians.

**Diarrhoea Assessment Tools** were not being utilised correctly; therefore, the infection prevention and control nurses (IPCNs) attended the areas and taught the nursing staff how to use them.
Being visible on the Units allowed the IPCNs to answer any queries that the staff may have had, and also ensured that patients had the correct isolation precautions and isolation stop signs.

Future steps
The aim of the poster was to summarise the enhanced observation project the IPCNs had undertaken and hopefully roll out the project to other wards/areas.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4507

Manikin Made Moments: Promoting good hand hygiene practice using a manikin for overseas nurses
Diane Melling-Picken
Royal Devon and Exeter Hospital

Improvement and issue context
On induction, staff receive theoretical infection control training, including the five moments for hand hygiene, using traditional didactic teaching methods. This has proved particularly challenging for nurses when English is not their first language as the lecture is delivered rapidly and provides little or no time for questions and discussion. Information from a matron indicated that whilst the overseas nurses on her ward were able to name the five moments for hand hygiene, they were unable to apply it to practice. Evidence for this was reflected in the monthly hand hygiene observation audits, which showed that compliance had fallen below the required standard of 85%. This suggested that a practical method of education was required to overcome the language issues.

Methods and measurement
The infection prevention nurse developed everyday nursing scenarios and, using a manikin rather than a real patient, worked with the overseas nurses who delivered “care” to the manikin. Other colleagues observed and questions were encouraged from all parties. The correct moment for hand hygiene and the rationale was explained at each intervention. A series of six sessions were undertaken, each lasting 20–30 minutes.

Verbal feedback from the matron and monthly hand hygiene observational audit results were used to measure the impact.

Evidence of improvement
Compliance prior to the intervention was 75–80%. Following the intervention, compliance improved with scores of 85–90%.

Future steps
This project has confirmed that demonstration and discussion has improved compliance in a clinical setting, at least in the short term. Audit will continue to determine whether the improvement will be sustained. Tailored hand hygiene sessions are now incorporated into the infection control training programme delivered to overseas nurses joining the Trust. It will be considered whether any other cohorts will benefit from this approach.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4511

Best Practice Express: Diarrhoea Roadshow
Dawn Westmoreland, Jennie Lovell, Sonia Mellor, Martha Bird, Pauline O’Keeffe, Manjula Natarajan
Kettering General Hospital NHS Foundation Trust

Improvement issues and context
Staring over the abyss at the 2015/2016 C. difficile trajectory, the 6-month position (20 against a 26 annual total) was looking precarious. How could we get back on track? The light bulb moment: we needed to think differently!

Methods and measurements
The Best Practice Express became a Trust-wide theme with screen savers, catchy rhythms asking staff to get on board, and there were A–Z emails with photos updating the Trust on everyone’s position. We rewarded areas for the number of C. difficile “free” days rather than focusing on “how many” infections they had. Wards received posters, regular league tables, highlighted good and consistent practice, bronze, silver and gold stars, and cakes made to look like the Bristol Stool Chart.

We introduced a Trust Mascot, ran a competition to name it and “Colin Oscopy” was born. He became a “firm” favourite, spending time at the Trust Board, attending meetings, and having his own Twitter and Facebook pages.

Evidence of improvement
We came in on trajectory: at 6 months, if we hadn’t changed, we would have been 10 over.

Future steps
Continuing the “Best Practice Express” theme, using the same methodology, we will add topic-specific carriages to the train, each quarter.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4519

Investigating the pharmacokinetics and pharmacodynamics of kanamycin and capreomycin in patients with DR-TB and the relationship between hearing levels: A feasibility study
Cara Hollander1, Karin Joubert1, Natalie Schellack2
1University of the Witwatersrand, 2Sefako Makgatho Health Sciences University

Background
In South Africa, administration of the DR-TB medication regimen has been simplified across four weight bands which accommodate the formulations available in the country, while complying with international requirements for minimum, maximum and average dose per kilogram. Broadly, at population level, people fall into one of three categories: responders, non-responders, and toxic responders, based on their inter-individual variation in DNA sequencing. These differences can result in under or over-dosing of the aminoglycosides (kanamycin/KM) and polypeptides (capreomycin/CM), which may affect efficacy, or result in toxicity. To achieve this ideal concentration, pharmacokinetics and pharmacodynamics of KM/CM could be considered in reducing toxic effects, (ototoxicity and nephrotoxicity) and improving treatment outcomes. Thus, the aim of this study was to investigate the pharmacokinetics and pharmacodynamics of KM/CM in patients with DR-TB and the relationship with hearing.

Methods
This exploratory, quantitative experimental research design is a multi-site study at Helen Joseph and South Rand Hospitals. The protocol reached saturation of data after enrolment of 20 participants, while undergoing audiological and pharmacological assessments at baseline and every 2 weeks for the first 3 months of treatment where possible, with 71 study visits in total. Creatinine clearance was measured, and overall outcome of treatment is being evaluated in relation to the pharmacokinetics.
Results and discussion
The study has just concluded, and to this effect data analysis has not been completed. Preliminary results reveal that intramuscular-administered KM results in erratic levels, with great differences among individuals. Variations in peak and trough levels have been observed between inpatient and outpatient treatment protocols. In accordance with literature, high-frequency hearing loss has been observed.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4554
The process of embedding CAUTI care bundles in NHS Scotland
Debbie Waddell1, Professor Kay Currie1, Professor Jo Booth1, Professor Jacqui Reilly1,2
1Glasgow Caledonian University, 2Health Protection Scotland

Introduction
Catheter-associated urinary tract infections (CAUTIs) are the most prevalent healthcare-associated infection globally and are one of the most common infections experienced in hospitals (Tambyah et al, 2012). The Scottish Patient Safety Programme developed a CAUTI care bundle to tackle the problem of CAUTI and assist with its reduction in Scotland. As a recent innovation in patient safety, there is much we can learn from the implementation, embedding and normalising of CAUTI care bundles in everyday practice.

Methods
Normalisation process theory (NPT) (May et al, 2009) has been used to study the implementation of complex healthcare interventions in a variety of healthcare areas. Using qualitative methodology, semi-structured interviews were conducted with 26 clinical leaders responsible for implementation, from 15 NHS Boards using NPT as a guiding framework. Framework analysis methods were applied to explore how clinical leaders make sense of the work of implementing the CAUTI care bundle (coherence); how they engage with it (cognitive participation); enact it (collective action) and appraise its effects (reflexive monitoring).

Results
Clinical leaders perceived the CAUTI care bundle approach to be a different way of working in comparison to previous urinary catheter management practices. There was general agreement that CAUTI care bundles met the needs of patients, staff and the organisation. A common challenge to implementation has been lack of consensus on the definition of CAUTI. Data illustrated that organisational support, staff education, awareness and stakeholder “buy-in” were paramount for success.

Discussion
This paper will present findings illustrating key barriers and enablers to the introduction of CAUTI care bundles from the perspective of clinical leaders responsible for implementation.

Declaration of interest
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Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4569
Multidisciplinary review of urinary catheters to facilitate earlier removal
Ashley Flores, Mrs Luisa Espiritu
Surrey & Sussex Healthcare NHS Trust

Improvement issue and context
The duration of urinary catheterisation is a major risk factor in the development of catheter-associated urinary tract infection (CAUTI). Limiting catheter use and minimising the duration the catheter remains in situ are primary strategies for CAUTI prevention. There is evidence that nurse-initiated catheter removal protocols significantly reduce the length of time catheters are in situ, with a corresponding reduction in CAUTI (Adams et al, 2012).

A practice development initiative took place on the Care of the Elderly wards at an acute Trust, the objective being to facilitate a multi-disciplinary review of each patient with a urinary catheter.

Methods and measurements
A practice development nurse (PDN) joined the multi-disciplinary (MDT) “whiteboard” meetings on the Care of the Elderly wards twice per week, for a period of 3 months. At this meeting, each patient with a urinary catheter was discussed with the aim of reviewing the clinical indication and facilitating early removal. The PDN also ran a number of ward-based education sessions on urinary catheter care and TWOC procedure. Surveillance of urinary catheter use took place for the duration of the initiative.

Evidence of improvement
The number of catheters in situ during the surveillance period is shown below, compared with the previous surveillance period:

<table>
<thead>
<tr>
<th>Ward</th>
<th>Number of catheters August 2013</th>
<th>Number of catheters May 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abinger</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>Nutfield</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Meadvale</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>17</td>
</tr>
</tbody>
</table>
Future steps
The data demonstrates a reduction in the number of urinary catheters in use on the Care of the Elderly wards and an improvement in the number of completed catheter care plans. It is acknowledged that the surveillance data is based on a snapshot of practice and the number of urinary catheters in situ at any one time is multifactorial.

However, this data provides some assurance that the review of urinary catheters at MDT meetings can facilitate a reduction in the number of catheters in situ and increase staff awareness. It is recommended that this initiative be implemented across the organisation.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4586
Collaborative working enables ward teams to “C the difference”
Holly Slyne, Wendy Foster
Northampton General Hospital NHS Trust

Improvement issue and context
In 2015/2016 the annual trust trajectory for patients developing *Clostridium difficile* infection (CDI) was exceeded by 48% and a comprehensive thematic analysis of these patients identified two key themes for improvement: prompt sampling and prompt isolation. The IPC team joined the NHS Improvement IPC Collaborative in April 2016 and used this driver to challenge three wards to improve quality collaboratively by reducing CDI incidence.

Methods and measures
Plan, Do, Study, Act (PDSA) cycles were implemented to trial various tests of change surrounding prompt sampling and prompt isolation. Weekly meetings maintained momentum and drove the PDSA cycles and improvements forward. Infection Prevention Society isolation audit results and CDI incidence provided the two outcome measures.

Five tests of change proved successful and were ramped up through the PDSA cycles to develop products, improve and embed them. These were education around sampling myths, a daily bay challenge to identify patients in bays with diarrhoea, a sticker affixed to faecal specimen pots to assist in documentation processes, the inclusion of side room usage on the daily ward huddle sheet and a revised diarrhoea care plan. Together these five products have formed the “C the difference” toolkit.

Evidence of improvement
Isolation audit results improved from 51% to 100%. Prior to the collaborative the average days between CDI cases was 12 days. Following the collaborative no patient developed CDI for 49 days. This is a success that has never before been achieved at the Trust since CDI surveillance commenced in 2009.

Future steps
The collaborative generated engagement and IPC quality improvement led by ward teams. The next step is to share the “C the difference” toolkit across the Trust and to achieve the next goal, that no patient develops CDI under our care for 100 days.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4591
*Clostridium difficile* improvement plan
Rosslyn Young, Jane Ryan, Nina Fraser, Cindy Sawford, Sharon Clarke, Hilary Duthie, Steve Dolan
Bedford Hospital

Service improvement project
Driver
In 2015/2016 Bedford Hospital declared 23 cases of *Clostridium difficile* infection (CDI). Therefore, we commenced an improvement plan with the view to ensure, and decrease lapses in, care in relation to CDI. Two wards were chosen for the 90-day collaborative.

A project team including the Corporate Nursing Team, IPC, matron, ward manager and business administrator was formed.

We developed a driver diagram and project initiation document, and developed a new stool assessment chart. The two wards testing the chart were supported using the plan, do, study, act service improvement model.

Results Ward 1:

<table>
<thead>
<tr>
<th>Week</th>
<th>Number of yes</th>
<th>Number of observations</th>
<th>Compliance achieved</th>
<th>What happened this week? (no more than 3 words)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6</td>
<td>15</td>
<td>40%</td>
<td>Baseline audit</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>21</td>
<td>19%</td>
<td>New stool chart</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>20</td>
<td>75%</td>
<td>Relaunch of chart</td>
</tr>
<tr>
<td>3</td>
<td>43</td>
<td>53</td>
<td>81%</td>
<td>Entire ward</td>
</tr>
<tr>
<td>4</td>
<td>93</td>
<td>128</td>
<td>73%</td>
<td>Changes to wording</td>
</tr>
<tr>
<td>5</td>
<td>85</td>
<td>117</td>
<td>73%</td>
<td>Wards closed</td>
</tr>
</tbody>
</table>

Results Ward 2:

<table>
<thead>
<tr>
<th>Week</th>
<th>Number of yes</th>
<th>Number of observations</th>
<th>Compliance achieved</th>
<th>What happened this week? (no more than 3 words)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>12</td>
<td>20</td>
<td>60%</td>
<td>Baseline audit</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>21</td>
<td>24%</td>
<td>New stool chart</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>25</td>
<td>68%</td>
<td>Relaunch of chart</td>
</tr>
<tr>
<td>3</td>
<td>51</td>
<td>66</td>
<td>77%</td>
<td>Entire ward</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>32</td>
<td>56%</td>
<td>Changes to wording</td>
</tr>
<tr>
<td>5</td>
<td>59</td>
<td>100</td>
<td>59%</td>
<td>Wards closed</td>
</tr>
</tbody>
</table>

Week 6 and 7: Compliance has improved on Ward 1, but this is not the case for Ward 2. The reasons for non-compliance are different, and are now being shared with the wards in greater detail to help to influence a change in practice.

We have discovered that winning hearts and minds and effective leadership are fundamental to success, and so we are striving to involve the wider team.

Greater understanding of improvement methodology is a great asset to enable staff to lead similar change in the future independently.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4593
Infection control in care homes – A proactive approach
Helen Pilley, Mr Nick Hughes
Cheshire and Wirral Partnership NHS Foundation Trust

Background
As part of the infection prevention and control (IPC) stabilisation agenda across the Western Cheshire Health Economy, the CWP IPC team offered stabilisation visits to all care homes, including residential care facilities and hospices in the Vale Royal and Western Cheshire Clinical Commissioning Groups. This is a total of 85 care providers.

Aim of the visits
The aim of the visits was to support care providers with key infection prevention and control information, thus promoting safe and effective care:
• seasonal influenza vaccination;
• winter preparedness;
• review of their IPC audit action plan;
• availability of hand hygiene products and decontamination processes;
• review of residents with invasive devices, including their plans of care;
• medication review of residents on any antimicrobials, including prophylaxis;
• the opportunity for staff to receive IPC training during the visit and promoting the aseptic non touch technique (ANTT).

Number of completed visits
Thirty-five care providers accepted the offer of a stabilisation visit, eight in Vale Royal CCG and 27 in Western Cheshire CCG, which is equal to a 41% response rate. The service continues to promote these visits at link meetings, other communications opportunities and in the newsletters. This poster presentation will articulate key findings and areas for development following this programme of stabilisation visits.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4597
Development of an environmental audit tool
Claire Hayward, Tracey Jones
Royal Wolverhampton NHS Trust

Introduction
Audit synopsis: In 2014 the Trust experienced a rise in *Clostridium difficile* infection and MRSA colonisation Trust-attributable infections. This triggered a review of assurance around environmental controls.

Background
The audit process that was currently adopted was “Credits for Cleaning” (C4C) and the annual Infection Prevention Society (IPS) audit. The current methodology of auditing utilising the national Patient-Led Assessment of Care Environment (PLACE) process was not highlighting any concerns. There were no noticeable deficits in mandatory training compliance, and clinical areas were reporting 100% in hand hygiene. An external inspection highlighted multiple issues around environmental standards and flaws in the environmental assurance process, impacting on patient care and increasing healthcare-associated infection (HCAI).

Method
The Infection Prevention Team drafted a response and developed an audit tool that incorporated issues not previously addressed. The tool was agreed by the organisation and was reviewed by the Infection Prevention and Control Group, Matrons Group, Environment Group and the Patient Safety Information Group (PSIG). The audit questions are weighted to low, medium and high risk, and are not viewable by the auditor. Results are presented at the Infection Prevention and Control Group meeting by ATP monitoring; water sampling for pseudomonas; training ward and domestic staff on disinfection practices; hand hygiene product evaluation on critical care and oncology units; introducing KWIK Isolation screens into the high dependency unit.

Results
The audits were introduced onto the audit programme in all clinical areas. The average audit compliance has risen from 34% to 90%. This poster will demonstrate an effective method for sustained environmental controls addressing areas of modern healthcare environment not addressed through national tools.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4602
Role of an “infection prevention and control support worker” (IPCSW) – First 6 months’ experience
Vickie Lam, Claire Oliver, Dr Richard Cooke
Alder Hey Children’s Hospital

Improvement issue and context
The role of an “infection prevention and control support worker” (IPCSW) is a newly created role within our existing IPC nursing team. Using the principles of a “healthcare assistant”, the role has been established specifically to assist the IPC delivery plan and to release the qualified IPC nurses to focus on key strategic and operational issues.

Methods and measurement
Over the first 6 months since the post was established, the various tasks delegated to the IPCSW were reviewed. Success was measured by evidence of completion of tasks and feedback from the IPC team.

Evidence of improvement
Using agreed methodologies, five IPC audits were successfully completed. These included auditing the storage of breast milk and decontamination of associated equipment, ward pantries, bed pantries, ward environments, and hand hygiene compliance. The IPCSW also initiated the following projects: review of staff changing facilities; environmental cleanliness evaluation by ATP monitoring; water sampling for pseudomonas; training ward and domestic staff on disinfection practices; hand hygiene product evaluation on critical care and oncology units; introducing KWIK Isolation screens into the high dependency unit.

Future steps
The IPCSW role is well established within the IPC team. The role allows for a targeted approach to IPC which is improving compliance Trust wide. A future area of role development will be supporting the Trust’s surgical site surveillance programme.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4604
Experience and early lessons implementing carbapenemase-producing Enterobacteriaceae (CPE) screening in an acute hospital in a low-risk region
Marc Lillystone, Ms Sarah Morter, Mr Jon Fish
Norfolk and Norwich University Hospital NHS Foundation Trust

Issue and context
In response to the PHE CPE Acute toolkit (2013), we implemented a screening and management protocol for an 1100-bed acute University NHS Foundation Trust. There was an unknown prevalence of CPE but considered low risk based on clinical isolates and no reported incidents of CPE within the region prior to implementation.

Methods and measurement
We identified existing patient admission pathways and adapted or developed their systems to include a CPE risk assessment with clinical teams. Electronic alert systems (via PAS, ICnet and Sunquest ICE) were updated to alert all positive and known “at risk” cases. Education and training was implemented by the IP&C team across the Trust, including a visual information poster.

Evidence of improvement
Between May 2015 and May 2016 there were 171 patients tested for CPE; of these only 92 patients (54%) were reported to IP&C to add to the database and alerts system, with five positive CPE results (3% of 171 screens). Of the 92 reported cases, complete screens (three samples) were completed on 53 (56%) patients, with 90% of the incomplete screens due to the patient being discharged before all samples were collected. Twenty-seven countries were identified as the trigger for CPE screening from these 92 cases. There was one incident during this timeframe due to delayed isolation which required contact screening seven patients (0 positives).

Future steps
One issue was that the IP&C team were unaware of 77 patients (46%) and therefore unable to add alerts or track the screening samples. Improvements are being developed to capture the data of all patients screened for CPE automatically to remove the need for separate notification processes. We propose a combined approach to screening with primary care services, which could address...
the issue with incomplete screens and offer cost savings, which warrants further consideration.

**Declaration of interest**
I do not have any conflict of interests to declare.

**Abstract ID: 4615**

**Improving sepsis recognition and management in the Paediatric ED**

Drew McDonald, Dr Catharina Hartman, Mr Chris Driver, Dr Jill King, Dr Anna Biscoe
NHS Grampian

**Improvement issue and context**
Sepsis is a major cause of mortality worldwide. Severe sepsis accounts for 1000 admissions to PICU every year in the UK. Of these 1000 admissions, 20% will die (i.e. 200 deaths per year). Improved pre-ICU care including early recognition, early use of antibiotics and cardiovascular support will greatly improve PICU outcomes. Adherence to APLS/ACCM-PALS guidelines is poor and no sepsis algorithm or consistent treatment plan was being used in RACH. No prior sepsis data had been collected in our hospital.

**Methods and measurement**
SPSS sepsis 6 protocol was implemented into our ED in 2014. We designed a sepsis recognition tool for nurse triage to determine whether a child is potentially septic. The tool triggers for an immediate senior doctor review and that doctor review determines whether the child requires sepsis 6 treatment. All children that present to the ED with an illness are screened by the recognition tool. The measure the time it takes from time of arrival to time of antibiotic administration and this is presented on a run chart and submitted to SPSS. We also measure many other aspects of our sepsis care (fluids, cultures).

**Evidence of improvement**
Over 3000 children have been screened since October 2014. Overall median time to antibiotics: 45 minutes. Antibiotic median times: 2014 = 52 minutes; 2015 = 45 minutes; 2016 = 30 minutes (so far).

- Of the four patients that have been transferred to PICU after sepsis 6 treatment in the ED we have a 0% mortality rate. We have had one death due to sepsis in our ED; this patient had a post-hospital cardiac arrest.

- Of our 66 patients treated by sepsis 6, 100% have been identified for senior doctor review by our recognition tool.

**Future steps**
We are currently implementing sepsis 6 into our paediatric assessment unit, Dr Gray’s (Elgin) emergency department and children’s ward, as well as maintaining our standards within our ED. We are looking into pre-hospital sepsis management (paramedics/GP).

**Declaration of interest**
I do not have any conflict of interests to declare.

**Abstract ID: 4623**

**A high-impact intervention for a high-impact intervention – Improving documentation of peripheral intravenous access insertion in theatre**

Dr Kavita Upadhyaya1, Dr Heidy Hendra1, Dr Nick Wilson2
1Broomfield Hospital, 2Postgraduate Medical Institute, Anglia Ruskin University

**Improvement issue and context**
The Department of Health’s High Impact Intervention (HII) – Peripheral intravenous cannulae care bundle lists six actions to be performed at the time of insertion of peripheral cannulae. The Health and Social Care Act 2008: Code of Practice on the prevention and control of infections and related guidance requires that “registered providers must audit compliance against key policies and procedures for infection prevention”. Effective audit of compliance is only possible if documentation is complete.

**Methods and measurement**
A baseline audit measured documentation of the HII actions on the anaesthetic charts of 50 consecutive patients who had cannulae inserted in theatre. Purpose-made stickers of the HII care bundle actions were then placed on the anaesthetic charts of patients pre-surgery. Re-audit data were collected from a further 50 anaesthetic charts post intervention.

**Evidence of improvement**
The six HII actions for peripheral cannula insertion were documented in 1/50 patients (2%) prior to intervention and in 26/50 patients (52%) post intervention (Fisher’s exact test $p < 0.0001$).

Placement of stickers in anaesthetic charts significantly improves the documentation of the HII peripheral intravenous cannulae care bundle actions in patients who have cannulae inserted in theatre.

**Future steps**
This is a low-tech intervention which produces a high-impact improvement in documentation. Future print runs of anaesthetic charts will be re-designed to include this documentation.

**Declaration of interest**
I do not have any conflict of interests to declare.

**Abstract ID: 4639**

**A new tool in infection prevention and control**

Kirsty Ferguson1, Pamela Joannidis2, Infection Prevention & Control Team Audit Group1
1NHS Greater Glasgow & Clyde, 2Nurse Consultant Infection Prevention & Control, NHS Greater Glasgow & Clyde

**Improvement issue**
Healthcare Improvement Scotland (HIS) believes that every person in Scotland should receive the best health care possible every time they come into contact with health services. Standards set by HIS request healthcare providers to have in place a systematic programme of audit that includes monitoring of standard infection control precautions (SICPs) compliance. This, along with recommendation for an annual audit of infection prevention and control (IPPC) policy and the implementation of transmission-based precautions (TBPs), led to development of a new tool in infection prevention and control.

**Methods**
During 2015 the Infection Prevention and Control Team IPCAT reviewed existing audit tools to determine gaps as well as duplication. The results of this review helped shape a revised infection prevention and control audit tool (IPCAT) comprising four sections: SICPs, TBP, SPE and quality improvement (PVC, CVC, UCC).

Development of a revised audit tool was followed by user acceptance testing of a web-based platform for data capture. Audit data gathered is entered directly onto a tablet device, and once synchronised is available immediately via an audit dashboard. The senior charge nurse (SCN) is sent an automated email, and by accessing the dashboard can view audit data including scores and action plans. The audit dashboard can provide SCNs with data for their area and service leads with data for areas grouped. Software is designed to allow IPCTs access to audit action plans to monitor progress and an automated email is generated in response to overdue actions. A scheduler is available via the platform to facilitate IPCT audit planning.

**Evidence**
Development of IPCAT has led to a streamlined audit process for NHS Greater Glasgow & Clyde, resulting in reduced administration time, real-time reporting and improved efficiency.

**Future steps**
IPCAT provides a quality-driven audit process and both IPCNs and service users have reported satisfaction with the audit process.

**Declaration of interest**
I do not have any conflict of interests to declare.
Implementing the CPE toolkit in an acute setting, the story so far...

Louise Hall1, Dr Julie Samuel1, Sheila Postlethwaite1, Jennifer Collins1, Tracey Eyre1, Alison Sykes1, Robert Forder2, Julia Taylor3
1The Newcastle upon Tyne Hospitals NHS Foundation Trust, 2Newcastle University

Methods and measurement
Staff knowledge of CPE was very limited prior to implementation of the toolkit. Promotion of key messages and a range of multi-faceted initiatives were delivered by the Infection Prevention and Control (IPC) Team to improve this and enhance compliance with the guidance. The electronic ordering system was amended to incorporate CPE screening and an alert was created for patients subsequently confirmed positive. Also, a question to identify high-risk cases was added to the current adult risk assessment document.

Evidence of improvement
Prior to introduction of the toolkit, patients were not routinely screened for CPE on admission. During the audit, 93 records were reviewed and 65.6% of high-risk cases were identified. All cases requiring screening had at least one sample submitted; however, only 11.1% had all of the required screening samples in accordance with policy. Where CPE was confirmed, 100% had the appropriate electronic alert added to their records.

Future steps
Continued education to raise CPE awareness and policy across all departments is required; we aim to re-audit compliance with policy in 12 months.

Quality assurance and improvement in primary care
Inam Ramsahye, Juliet Magee, Sanjeev Bundhoo, Michelle Forde, Maria Candice
NEL Commissioning Support Unit

Improvement issue and context
The Primary Care Infection Prevention and Control (IPC) Team undertook 416 audits of General Practice (GP) and General Dental Practices (GDP) in 2015/2016. This process was to provide quality assurance that primary care providers are compliant with current IPC practice in line with the Health and Safety Care Act (2015).

Methods and measurement
The IPC team used a validated IPC audit tool and provided specialist IPC audit support to GPs and GDPs. The team also provided input into new-build and refurbishment projects, working closely with commissioners to provide oversight and receive assurance on IPC across a large geographical area.

Evidence of improvement
The aggregated data identified key themes of non-compliance, including:

- Environmental – challenging environmental conditions, non-compliant taps and hand-washing sinks, tiled splash back with grouted joins, storage of cleaning equipment, storage of vaccines in containers that were not webbed like baskets, and sharps containers not assembled and labelled correctly.
- Staff health – suboptimal completion or information regarding hepatitis B vaccination and measles, varicella and rubella immunity status.
- Staff knowledge – access to training, IPC policies out of date or not standardised.

The IPC team found that after follow-up on action plans, GPs and GDPs achieved >95% compliance with the audit.

Designing an integrative literature review of the theoretical basis of interventions against healthcare-associated infections
Konstantinos Tsatsalios, Colin Macduff, Sarah Henderson, Richard Laing
The Robert Gordon University

Background
Healthcare-associated infections (HAIs) remain an important public health problem across the globe, affecting patients, healthcare staff and visitors. A prime focus of interventions aiming at tackling HAIs is the prevention and control of pathogens by increasing healthcare staff’s adherence to hygiene regulations.

However, despite the plethora of these interventions, only a few are structured based on theoretical underpinnings and even fewer authors explicitly describe how the design and development of the intervention is informed by the adopted theory. Yet, no systematic approach has been undertaken for providing clarity as to the importance of theory when conceptualising an intervention within the medical context.

Aims and methods
Therefore, the current work refers to the design of an integrative literature review that aims at identifying a variety of relevant quantitative and qualitative evidence. More specifically, this systematic approach will answer what and how theory can be embedded and implemented at the design and development stage against HAIs.

All levels of evidence will be reviewed as potentially relevant sources of knowledge, from Level I (e.g. systematic reviews) to Level V (e.g. expert opinions). The structure of the search strategy as well as the data collection—analysis will be publicly available (PROSPERO protocol registration) prior to, and during the course of, the actual review process.

Upon its completion, the findings will be disseminated in a health-related peer-reviewed journal. To the best of the authors’ knowledge, this is the first in-depth systematic attempt to scope and integrate such a wide range of research and non-research evidence.

The final findings not only will summarise theories implemented within interventions but, more importantly, they will form a useful and practical guide.
for future research in this field, aiding scientists to decide what theory is more appropriate for their own study and how this can be achieved when developing an intervention against HAIs.

**Declaration of interest**
I do not have any conflict of interests to declare.

**Abstract ID: 4669**

I-Hydrate – Improving hydration in nursing home residents to reduce morbidity from infection and prevent hospital admissions

Jennie Wilson, Alison Tingle, Heather Loveday, Aggie Bak, Amalia Tsiami, Carolynn Greene
University of West London

**Improvement issue and context**
Dehydration is an increasing problem among older people, with frail, dependent nursing home residents being especially vulnerable. Consequences of dehydration include urinary tract infection and other morbidity. Infections in older people account for a considerable proportion of antimicrobial prescribing and associated problems of resistance. Factors which may lead to inadequate hydration of residents include poor staffing levels, lack of supervision and knowledge, and limited appreciation of the importance of hydration.

**Methods and measurement**
This project used service improvement methodology to optimise the hydration of residents, working in partnership with two nursing homes. Process maps and action effect diagrams were developed through observation and input from care home staff and residents/relatives to describe current systems and identify contributory factors and actions. Plan–do–study–act (PDSA) cycles were used to develop sustainable changes. Improvement was measured using hydration-linked events, e.g. UTI, laxative/antibiotic use, staff/resident feedback, and number/volume of fluids consumed. Data was entered in statistical process control charts.

**Evidence of improvement**
Observations identified fluid intakes of commonly less than 1000 ml/day, with fully dependent residents particularly at risk; food promoted in favour of fluids; and opportunities for drinks missed. PDSA cycles were used to introduce protected drinks time, testing new equipment to support residents’ drinking, mealtime cards, and drinks menus to enhance choice of fluids. These changes resulted in more residents receiving drinks and an increase in individual fluid intake. A staff training programme on hydration was developed, with attendees reporting an increase in knowledge and anticipated change in practice.

**Future steps**
Small changes to practice in care homes have the potential to ensure sustainable long-term service improvement and reduced morbidity and hospital admissions. The package of tested quality improvement initiatives and a staff training programme will be disseminated to other nursing homes. Learning could be applicable to acute care settings.

**Declaration of interest**
I do not have any conflict of interests to declare.

**Abstract ID: 4620**

To swab or not to swab? That is the question

Jane Tideswell
Cheshire Wirral Partnership

There are two techniques universally associated with wound swab procedure. They are the Z-Track (zig zag) method and the Levine method. Anecdotal evidence has shown that healthcare professionals are unaware of the existence of either process. I believe that it is necessary to promote that there is a research-based, scientific process which underpins the rationale behind the swabbing of wounds. Definitive guidelines for this supposedly relatively simple procedure have yet to be established, hence my interest in the subject.

IPC standard precautions, to include hand washing, must be applied at all times before and during the swab procedure.

In the case of acute wounds which are suspected of being infected, the 10 point, Z-Track method should be executed. In the case of chronic wounds, where Biofilm formation may be present, it is argued that the Levine method of wound swabbing be implemented as it is crucial to apply gentle, downward pressure to release fluid from the deeper layers of the wound bed. Care should be taken to ensure that the swab only comes into contact with the wound surface.

Wounds must be cleansed with either tap water or normal saline prior to the swab being performed. Research suggests that in the instances of moist wounds, a wound swab may be used without pre-moistening the cotton tip with normal saline. Conversely, in the case of drier wounds, research suggests that swabs should always be pre-moistened with normal saline prior to collection to increase the chances recovering micro-organisms from the site of the wound. However, much debate surrounds this issue.

 Necrotic tissue, slough or any other contaminated material should be removed from the wound bed before a representative wound swab sample is taken, as failure to do so may confound the microbiology results and lead to inappropriate antibiotic treatment.

If pus is present it is important that a sample be sent for culture. It is advised that aspiration using a sterile syringe to collect exudate (0.5 ml) from the wound is the preferred method.

Research suggests that there needs to be standardisation around how swabs should be taken, to include the correct labelling and transportation of the specimen to the microbiology laboratory. It is important to ensure that the patient’s name, date of birth, specimen source, ongoing treatment, underlying co-morbidities as well as the time that the culture was taken be appropriately noted on the biohazard envelope, and to ensure that it is sent to lab within 4 hours if possible.

There is limited substantial quantitative data available for me to include in my abstract, as research studies into wound swabbing are limited and have generally been done using a small-scale sample of participants. Interestingly, numerous studies demonstrate that wound swabbing is historically grounded in ritualistic rather than evidence-based practice. Wound swabbing may appear to be a relatively simple procedure, but it is a subject for future discussion. I would argue that IPC need to be involved in the development of wound swabbing policies and protocols to ensure that swabs are collected in an evidence-based, consistent approach.

**Declaration of interest**
I do not have any conflict of interests to declare.
Other topics

Abstract ID: 4542
Infection control and cancer: A perfect storm
Pat Cattini, Sarah Whitney
Royal Marsden NHS Foundation Trust
This poster will support Session 18b

Context
Cancer is among the leading causes of death in the developed world. Most people with cancer die from infection, not their disease.

Treatments for cancer including surgery, radiation, chemotherapy, and transplant leave a patient more vulnerable to infection than a healthy adult of similar age. On top of this, the global threat of antibiotic resistance poses a particular risk. Antibiotics have revolutionised cancer treatment by enabling the use of more aggressive therapies, leading to higher survival rates. For this medically vulnerable group, the loss of effective antibiotics would have dire ramifications.

A cancer hospital can be the setting for the perfect storm, with a collection of vulnerable patients, many from overseas, coupled with aggressive treatments which can cause unpleasant side effects such as leucopenia, mucositis, and diarrhoea.

Methods
Key infection issues will be highlighted and considered, including: CRE, antimicrobial stewardship, treatment of neutropaenic sepsis, use of chemotherapy, C. difficile infection, pre-op screening to prevent SSI, IV lines and other invasive devices, viral respiratory infections, reactivation of viruses, loss of immunity, decontamination of the environment, use of probiotics and FMT.

Evidence of improvement
As infection prevention specialists, we often focus on preventing exogenous infection and we don’t always consider endogenous infection from the patient’s own flora.

The poster will equip the reader with an overview and understanding of some of the complexities of preventing infection in cancer patients, promote discussion, and provide ideas for future strategies to help in the battle against cancer.

Future steps
Cancer is the leading cause of death in the developed world. It has been predicted that resistant infections will kill more people than cancer by 2050. Further work needs to be undertaken to consolidate and strengthen current infection prevention knowledge and to develop new ideas which don’t involve reliance on antimicrobials.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4646
A systematic literature review on the core components for national infection prevention and control programmes
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1Glasgow Caledonian University, 2World Health Organization

Introduction
The World Health Organization’s (WHO) guidance on the Core Components for Infection Prevention and Control (IPC) programmes is being revised with a view to basing this guidance on the best available evidence in order to support the prevention of healthcare-associated infections (HAI) and the global burden of antimicrobial resistance. With WHO approval, a systematic review was conducted to identify national core components for IPC programmes.

Methods
Five databases were searched for papers published between 2000 and 2015 reporting the effectiveness of national IPC programmes. Papers identified were screened against the eligibility criteria and further assessed according to Cochrane’s Effective Practice and Organisation of Care (EPOC) study design criteria. Data were extracted and risk of bias assessments undertaken. The quality of the body of evidence was assessed using the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach, where appropriate.

Results
One hundred and ten studies met the inclusion criteria, of which 26 studies met the EPOC design criteria. Four component themes were identified from the 26 studies: multimodal IPC programmes (n = 16), IPC care bundles (n = 4), IPC policies (n = 4), and IPC surveillance, monitoring and feedback (n = 2). The majority of interventions evaluated in the 26 studies focused on preventing a specified infection (central line-associated bloodstream infections being the most frequent) or HAI more generally, or promoting hand hygiene. Individual studies demonstrated effectiveness; however, only three (of the 26) studies had a low risk of bias.

Discussion
While, impressively, 26 studies had a robust research design, there was variation in the rigour with which these were conducted. The range of interventions and outcomes measured limited synthesis of the findings, but strong policy-level recommendations can be made under the guidance of the WHO secretariat and expert group, as well as an outline of existing research gaps.

Declaration of interest
I do not have any conflict of interests to declare.
• Increased number of water outlets requiring flushing and sampling for legionella and \textit{Pseudomonas}.
• IPC signage – when unable to attach to walls and when cubicles have glass doors.

Learning
• Being the first site in the UK to introduce equipment or products can create additional problems.
• You can never have too much storage in wards/departments.

• Development of ward/department-based infection control policies enabled staff to engage with IPC before the move.
• The new building with more cubicles can make staff complacent.

Conclusion
A new hospital building may be easier to clean and to isolate patients, but commissioning and essential commodities must be available before the move.

Declaration of interest
I do not have any conflict of interests to declare.
Standard precautions including hand hygiene

Abstract ID: 4495
What factors promote or inhibit compliance with contact precautions in a neonatal intensive care unit?
Sue Dally1, Dona Foster2
1University Hospital Southampton NHS Foundation Trust, 2Oxford Brookes University

Background
Neonates are uniquely susceptible to infections due to their immature immune systems. Unfortunately, healthcare-associated infections and outbreaks caused by multi-drug-resistant organisms (MDROs) are increasingly occurring in neonatal intensive care units (NICUs). Using contact precautions is one of the main methods of preventing the spread of MDROs because often neonates cannot safely be isolated in side rooms. The aim of this primary research study is to identify what factors promote or inhibit compliance with contact precautions in a NICU.

Methods
Ten semi-structured interviews of nursing staff were carried out between February and April 2015. The interviews were audio recorded, transcribed verbatim and analysed using thematic analysis.

Results
Thematic analysis identified two opposing responses from the participants. Four nurses commented the unit coped well with neonates on contact precautions whilst conversely four senior staff felt quite strongly there were serious challenges. Two staff had a more neutral response. Themes were associated with the environment and equipment, knowledge and communication, and concerns about how unintended breaches occurred. Two issues identified that appear unique to this unit are a lack of space causing unintended breaches of contact precautions by allowing the staff to multi-task, and delayed removal of signage resulting in some neonates remaining on contact precautions for longer than necessary. Issues identified that were common to other research studies were the requirement to challenge staff practice and provision of adequate supplies of gloves. Staff suggested changes to their unit that could improve compliance, for example standardisation of cot space, improved signage and training.

Conclusion
This research study has identified findings that appear unique to this unit and others which are more common to healthcare staff carrying out contact precautions in other NNUs.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4532
Literature review of factors influencing the effectiveness of handrubbing with alcohol-based handrubs within clinical practice
Lucyna Godzielewksa
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Introduction
Effective hand hygiene is the single, most important factor in preventing the spread of healthcare-associated infections. Two main components of effective hand hygiene within clinical settings include opportunity and technique. The former relates to the WHO’s five moments for hand hygiene. Evidence suggests that compliance with opportunity improves when alcohol-based handrub (ABHR) is available. However, evidence for the most effective handrubbing technique remains limited and inconsistencies in guidelines exist.

Abstract ID: 4533
Safe surgical hands in the operating theatre – Sustained improvement following a multi-modal hand hygiene campaign
Fiona Smith, Ms Karen Wares, Dr Eleanor Binnie-Mcleod, Mrs Elizabeth Irvine, Mr Mark Higgins, Mrs Helen Morgan, Mrs Janet Mitchell, Ms Angela Henderson
NHS Grampian

Improvement issue and context
Bacterial transmission in an operating room from patient to equipment and healthcare providers’ hands and even to the next patient in the operating room has been associated with healthcare-associated infection. Hand hygiene will interrupt transmission of microbes between patients, healthcare workers and the inanimate environment. In 2009, to address this patient safety risk, the Infection Prevention and Control Team began to work with the medical and nursing teams to embed the World Health Organization’s concept of “My five moments for hand hygiene” in the Operating Department.

Methods and measurement
Direct observation was utilised by infection prevention and control nurses in the operating room in 2009. This established the work flow of operating room staff to guide additional alcohol-based hand rub placement, and measure baseline hand hygiene compliance rates using the World Health Organization’s observation method. Multidisciplinary operative staff interviews were undertaken in 2009 to establish staff hand hygiene training needs and understanding of the World Health Organization’s “My 5 moments for hand hygiene”. A timeline will show a summary of the milestones demonstrating the ongoing collaborative improvement work since 2009.

Evidence of improvement
A graph will display the Operating Room hand hygiene audits results dated 2009–current.
Future plans
Direct observation is planned to further define the World Health Organization fifth moment for hand hygiene in an operating room. A study tour to the University Hospital Zurich to learn how the fifth moment for hand hygiene has been defined in operating rooms is planned. Continued hand hygiene audits linked with rapid feedback will be utilised to address non-compliance.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4573
Use of a multimodal intervention incorporating audit and targeted feedback to improve hand hygiene compliance and reduce orthopaedic surgical site infections. A quasi-experimental retrospective before and after study design

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Introduction
Healthcare-associated infection (HCAI) is a worldwide patient safety issue. Compliance with hand hygiene guidelines has been demonstrated to be an effective method of reducing HCAI; however, it remains suboptimal and poorer amongst physicians compared with other healthcare workers. The aim of this study is to determine the relationship between a multimodal quality improvement intervention, incorporating observational hand hygiene auditing with individualised feedback to physicians, and the incidence of surgical site infection (SSI).

Methods
The research design is a quasi-experimental retrospective before and after study design. The aim was to test the hypothesis that the multimodal intervention would lead to at least a 1% drop (to 0.44%) in SSIs.

The intervention incorporated: increased provision of alcohol-based hand rub; education; targeted observational hand hygiene auditing (OHHA) with individual feedback; and the introduction of a surgical site care bundle.

The outcome measures include: the rate of SSIs in patients who received an orthopaedic implant surgery and the proportion of observed hand hygiene compliance.

Results
Surgical site surveillance data on 3703 patients were included in the before (n = 1806) and after (n = 1897) study. The risk of a patient developing an orthopaedic SSI decreased from 1.44% (n = 26), 95% CI (0.89–1.99) in the pre-intervention phase to 0.69% (n = 13), 95% CI (0.38–1.21) in the post-intervention phase, χ² (1, n = 3703)= 5.05, p = 0.024.

There was a statistically significant increase in observed hand hygiene compliance overall to 91%, 95% CI (0.90–0.91), p < 0.01 and an 18% increase in compliance amongst consultant staff, p < 0.01.

Discussion
There is a statistically significant reduction in SSI, with infection rates being reduced by half. There are statistically significant increases in observed hand hygiene compliance. Providing targeted individualised audit feedback significantly improves compliance with hand hygiene guidelines.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4601
Reasons for poor hand hygiene compliance among healthcare workers in sub-Saharan countries

Yetunde Ataiyero, Dr Judith Dyson, Dr Moira Graham
University of Hull

Background
The prevalence of healthcare-associated infections (HCAI) in developing countries, especially sub-Saharan African (SSA) countries, has been underreported, and whilst the actual magnitude remains unknown due to deficient surveillance studies and lack of reliable data, estimates suggest this to be 2–20 times more prevalent than in developed countries. In SSA and South-East Asia, HCAI contribute 4–56% (75%) to all causes of mortality in neonates.

Contaminated hands of healthcare workers play a significant role in the transfer of these infections to and within patients. Conscientious hand hygiene practice is the simplest, most accessible, affordable and effective preventive method, although compliance with hand hygiene guidelines remains very low. In developed countries, reasons for poor compliance have been attributed to lack of hand hygiene facilities, type of ward, specialty and procedure and the professional category.

Aim
A systematic review which will assess the barriers to effective hand hygiene practices among healthcare workers from SSA countries.

Method
Bearing in mind the selection criteria, a systematic literature search through electronic and subject-specific databases will be conducted. Peer-reviewed, primary studies published in English, conducted among hospital-based healthcare workers in sub-Saharan Africa and which reported on the barriers of hand hygiene practices will be included in this review.

Results and conclusion
A critical appraisal of the included studies will be done using the Critical Appraisal Skills Programme (CASP) tool to identify the strengths and weaknesses of the articles. The findings of the review will be analysed using thematic analysis and the key barriers will be presented. The similarities/differences in the identified barriers in both SSA and developed/western countries will also be identified.

Declaration of interest
I do not have any conflict of interests to declare.

Abstract ID: 4631
Exploring the “Urgh Factor”: To what extent can behavioural theory (inherent/elective) contribute to improving processes of hand hygiene measurement and education? Results from Phase I

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Introduction
We conducted a mixed-method study to develop knowledge of inherent and elective hand hygiene (HH) in clinical practice through the application of a new direct observation measurement tool, enhancing meaningful feedback. Difference in HH compliance for clinical activities categorised as inherent or elective was tested.

Methods
Two settings were selected: a cardio-thoracic ward (CT) and a renal-haemodialysis unit (RH). A powered sample of 20 (nurses, healthcare support staff) from each unit (N=40) were each observed for up to 1 hour by two researchers.
The first 15 minutes of each observation were discarded to reduce limitations (e.g. Hawthorne Effect/Observer Bias).

Clinical activities (e.g. emptying catheter) and associated HH behaviour were recorded.

A random number generator selected one inherent and elective activity from each participant for analysis.

HH was expected to be more likely for inherent activities. As regular exposure to blood may reduce inherent HH through desensitisation, less difference was predicted within the RH.

Semi-structured interviews with N=13 staff across both settings explored the meaningfulness of the current measurement and preference for future feedback mechanisms.

**Results and discussion**

Data was collected over 9 days between 3rd and 24th December 2015. Of the 369 observations conducted, 40 were randomly selected for analysis. The effect of inherent and elective activities on likelihood of HH occurring was determined using a McNemar test of difference.

Both settings showed statistically significant differences between inherent vs. elective HH activities. Higher likelihood for HH was observed for inherent activities and was weaker within RH as predicted (RH: \( p=0.045 \); CT: \( p=0.003 \)).

The interviews revealed that staff knowledge of HH referred to training scores rather than their specific ward HH performance data. Participants felt that measurement and reporting of HH performance based on inherent and elective activities may enhance meaning for staff. This is currently being explored in Phase 2 of this research programme.

**Declaration of interest**

I do not have any conflict of interests to declare.

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**Hand hygiene compliance: A systematic review of the evidence**

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**Introduction**

Reducing healthcare-associated infections through improving hand hygiene compliance amongst healthcare professionals remains topical. However, research evidence suggests that hand hygiene compliance remains sub-optimal across various geographical locations and healthcare settings. The aim of this poster is to report the outcomes of a recently published systematic review of peer-reviewed published studies, notably clinical trials, which focus on hand hygiene compliance among healthcare professionals.

**Methods**

Literature published between December 2009 and February 2014, which is indexed in PubMed and Cinahl, on the topic of hand hygiene compliance, was searched. Following examination of the 57 publications initially reviewed, the final number of papers appraised is 16.

**Results**

A lack of homogeneity in research design made meta-analysis difficult to achieve; however, comparative analysis was possible. The majority of studies were conducted in the USA and Europe, in intensive care units and care of the elderly facilities. The nurse, the healthcare assistant and the doctor are the three categories of healthcare worker most often the focus of the research.

Published studies demonstrate that moderate improvements to hand hygiene compliance rates were achieved when organisations adopted a multimodal approach, incorporating up to six strategies for change. The multimodal approaches used were either guided by the World Health Organization (WHO) hand hygiene framework or by an independently tested multimodal framework.

**Discussion**

Hand hygiene compliance remains an important patient safety issue, as we strive to reduce healthcare-associated infection rates across the globe. The WHO multimodal hand hygiene framework is transferable to a variety of healthcare and education settings globally, and international research evidence suggests that moderate improvements in hand hygiene compliance rates can be achieved when it is adopted.

**Declaration of interest**

I do not have any conflict of interests to declare.