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Invited Speaker Abstracts

Decolonisation to reduce multi drug-resistant organisms in healthcare: who, what, where, when, and why?

Dr Susan Huang

Professor and Hospital Epidemiologist, University of California Irvine School of Medicine

Monday 26 November - 09:00-10:00

Body surface decolonization with chlorhexidine bathing and nasal mupirocin has become a simple solution for prevention of healthcare-associated infections. The clinical trial evidence for this practice will be reviewed to understand who benefits from this practice, for what reasons, and at what times. The method of bathing and nasal decolonization will also be discussed as proper application is needed for maximal effectiveness. Finally, we will consider the conflict between current effectiveness and future potential for fueling the emergence of resistance.

The findings from the REACH trial

Prof Nicholas Graves

Academic Director, Australian Centre for Health Services Innovation

Monday 26 November - 10:45-11:15

Some organisms survive in the hospital environment for months posing an ongoing risk. Patients admitted to a room previously occupied by another patient with a multi-drug resistant organism face an increased risk of colonization and infection. Hospital environmental cleaning is an important element of any prevention and control program. Few studies have been done that measure the impacts of improved cleaning practices. The Researching Effective Approaches to Cleaning in Hospitals (REACH) trial was a multi-site stepped wedge randomized trial implemented in 11 Australian hospitals from 2016 to 2017. The environmental cleaning bundle had five interdependent evidence-based components of training, technique, product, audit and communication. The target audience were environmental services staff. The primary outcome measures were incidences of healthcare-associated *Staphylococcus aureus* bacteraemia, *Clostridium difficile* infection and vancomycin-resistant enterococcal infection. Thoroughness of hospital cleaning was assessed with the fluorescent marking gel and ultraviolet light system. All major findings will be presented and discussed. This study generated exciting and novel evidence about the effectiveness and cost-effectiveness of a hospital cleaning initiative.

Education for specialists

Dr Nico Mutters

Specialist for Infection Control, University Medical Center Freiburg

Monday 26 November - 10:45-11:15

The EUCIC Infection Prevention and Control Certificate - A European training programme

Gram-negative resistance

Ms Janet Hindler

Clinical Microbiology Consultant, UCLA Medical Centre

Monday 26 November - 10:45-11:30

Concerns about antimicrobial resistance with commonly encountered Gram-negative bacteria such as *Acinetobacter*, *Pseudomonas aeruginosa* and members of the *Enterobacteriaceae* now overshadow concerns about resistance among most other microbes including MRSA and VRE. Conversations about carbapenem-resistant *Enterobacteriaceae* (CRE) and limited therapeutic options for treatment of CRE infections have become commonplace with many staff members in all types of healthcare facilities. In order to appreciate the complexities of Gram-negative resistance, the concepts of intrinsic resistance, acquired resistance, multidrug resistance and pan drug resistance must be understood. It is important to be familiar with the various susceptibility test methods available to reliably detect resistance among Gram-negative bacteria and limitations of these test methods. Laboratorians, physicians, pharmacists and infection prevention practitioners must collaborate to develop thoughtful strategies for antimicrobial susceptibility testing and communication of test results. Monitoring the prevalence of resistance among gram-negative bacteria at local, national and global levels is critical to inform intervention protocols, decisions about treatment options and new drug development. This talk will address some of the main concerns with these and other issues as they relate to antimicrobial resistance in Gram-negative bacteria in 2018.

Better quality guidelines are the key for improved infection control outcomes - Against the motion

Prof Michael Borg

Head of Infection Prevention and Control, Mater Dei Hospital

Monday 26 November - 10:45-12:15

N/A

Better quality guidelines are the key for improved infection control outcomes - For the motion

Prof Gary French
President , HIS

Monday 26 November - 10:45-12:15

It is astonishing that eighteen years into the 21st century, much of our infection prevention and Control (IPC) practice still lacks evidence-based support. Most published studies on IPC are of poor quality and much of our IPC guidance has little scientific basis; at least 25% and up to half of guideline recommendations have no good supporting evidence. However, guidelines have authority and this influences inappropriate practice, wasted expenditure, unnecessary regulation, misguided legislation and unwarranted litigation, leading to squandered resources and patient harm. It also produces self-delusion and complacency and inhibits further research. We must admit to ourselves that we do not have good evidence for much of our IPC practice and strive to get support for better research. We must ensure that only good quality studies are performed and published and that policies and guidelines are based on properly evaluated evidence rather than tradition and expert opinion. Our patients would expect nothing less.

Education of non-specialists

Prof Silvio Brusaferrò

Professor of Hygiene And Public Health, University Of Udine

Monday 26 November - 11:15-11:45

Not yet provided.

Engineering the environment to IPC

Dr Lena Ciric

Senior Lecturer in Environmental Engineering, University College London

Monday 26 November - 11:15-11:45

The hospital environment is often overlooked as a reservoir of pathogenic microorganisms which can cause patient infections and lead to increased morbidity, mortality and costs to the NHS. This environment consists of surfaces, water systems and air systems. While guidance exists on how these environments should be cleaned and maintained, it is based on very few studies. A much broader evidence base is required in order to better inform infection prevention and control practice related to the hospital environment. The Healthy Infrastructure Research Group (www.cege.ucl.ac.uk/HIRG) at UCL carries out research into the microorganisms present in the build environment and designs and tests engineering solutions to reduce the spread of infectious disease in buildings. Work will be presented that shows the diversity and level of antibiotic resistance of microbial organisms which reside in the outlets of the hospital water system, the sinks. Furthermore, a number of novel solutions which could be applied in the hospital environment to reduce the number of pathogenic organisms will also be presented. These consist of antimicrobial surfaces and novel antimicrobial filters for water and air.

Current trends and opinions

Prof David Livermore

Prof of Medical Microbiology, University of East Anglia

Monday 26 November - 11:30-12:15

The main resistance risk comes from gram-negative bacteria – though the shortage of bactericidal antibiotics for *Enterococcus faecium* endocarditis remains concerning. For *Enterobacteriaceae*, major issues are the rise in carbapenemase producers, and their diversity. KPC carbapenemases – often in *Klebsiella pneumoniae* ST258 – dominates in the Americas, China and southern Europe but OXA-48 and NDM types are commoner in the Middle East and India. Other concerns include transferable colistin resistance, mediated by *mcr* genes and acquired pan-aminoglycoside resistance mediated by ribosome-modifying methyltransferases. For *Pseudomonas aeruginosa*, resistance largely remains mutational; transferable resistance is rarer but, with carbapenems readily compromised by loss of porin OprD, ESBLs – particularly the increasingly prevalent VEB types, become as problematic as carbapenemases. The UK remains ‘low resistance’ by international standards, but all these problem types are regularly and increasingly encountered. Moreover, as a global crossroads, the UK sees a wide diversity of resistance types, some of which become locally established. NDM carbapenemases – initially travel associated – are now endemic, and methyltransferases, once associated strongly with *bla*NDM, are now more scattered. The UK’s heavy dependence of penicillin/ β -lactamase inhibitor combinations also deserves discussion, given both the frequency of resistance to amoxicillin-clavulanate at EUCAST’s breakpoint and the MERINO trial, questioning activity against ESBL producers.

Environmental contamination simulation exercise

Dr Brian Crook

Microbiology Team Leader, HSE Buxton

Monday 26 November - 11:45-12:15

Preventing cross-contamination in the healthcare environment is fundamental to the control of patient infection and to safeguard the health of care workers. This was brought home by the number of healthcare workers who, under challenging circumstances, succumbed to Ebola Virus Disease (EVD) infection in the West Africa outbreak in 2013-16, and in the recent and current EVD outbreaks in Democratic Republic of Congo, where once again care workers have been infected. Controlling exposure to pathogens in any healthcare setting is a combination of developing and applying safe practices, and the proper use of personal protective equipment (PPE) as applicable, including safe removal and disposal of contaminated PPE. Simulation exercises can provide a powerful tool for safe practice training and also an evidence base to demonstrate effectiveness of control measures. This presentation will provide an overview of the development of simulation methods, including fluorescence visualisation, used in training and assessment. It will also refer to work done collaboratively with Sheffield Teaching Hospitals (which will be presented later in the Conference) to develop a mannequin-based fluorescence visualisation exercise to evaluate PPE ensembles used to protect care workers from high consequence infection diseases.

Education of the public

Prof Heather Loveday

Professor of Evidence-based Healthcare, University of West London

Monday 26 November - 11:45-12:15

This presentation will explore the evidence underpinning education of the public that goes beyond campaigning in order to effect improved knowledge and changes in behaviour. The practicalities involved in delivering public education in infection prevention and control and anti microbial resistance will be explored.

Pathogens, infection and water: the real hospital microbiome?

Prof Nicholas Loman

Professor of Microbial Genomics and Bioinformatics, University of Birmingham

Monday 26 November - 13:45-14:10

Whilst the idea of the hospital microbiome is an exciting one, it is unknown how important it is for the spread of infection. In this talk I will review evidence for a true hospital microbiome and put these in context of the field of the human microbiome. I will focus on a true example of a hospital microbiome: the population of *Pseudomonas aeruginosa* intimately associated with the human built environment, in the form of plumbing systems. I will present recent results from a very large scale genomic survey of *Pseudomonas* in hospital water across four hospital Trusts, and evaluate what the results mean for infection control interventions, and measures to monitor and control the development of antimicrobial resistance in the hospital environment.

Colonisation and succession of hospital-associated bacteria

Dr Simon Lax

Postdoctoral Fellow, Massachusetts Institute of Technology

Monday 26 November - 14:10-14:35

The microorganisms that inhabit hospitals may influence patient recovery and outcome, although the complexity and diversity of these bacterial communities can confound our ability to focus on potential pathogens in isolation. I will present the results of a year-long study of a newly constructed hospital that aims to develop a community-level understanding of how microorganisms colonize and move through the healthcare environment. We collected over 7,000 samples of built surfaces within the hospital and of patient and staff skin, beginning 3 months before the hospital became operational and ending a year after its opening. With this dataset, we show that the bacteria in patient rooms, especially on bedrails, consistently resembles the skin microbiota of the patient occupying the room. We further demonstrate that patients and their hospital rooms increase in microbial similarity over time, and that the directionality of transfer between the room and patient changes over the course of the patient's stay. We also assess the skin microbiota of patients in the context of clinical and environmental factors.

'Microbial armour'? - the patient's microbiome in infection prevention/control

Dr Nicola Fawcett

MRC Clinical Research Fellow, Registrar in Acute/General Medicine, University of Oxford

Monday 26 November - 14:35-15:00

There is an increasing body of evidence that the symbiotic bacteria existing on a patient can affect risk of colonisation and infection by resistant pathogens. The evidence base, and ways of avoiding unnecessary disruption of this microbial community, is discussed.

In favour of high technology

Dr Curtis Donskey

Hospital Epidemiologist, Cleveland Veterans Affairs Medical Center

Monday 26 November - 15:45-16:15

Not yet provided.

Next generation sequencing in clinical microbiology - the hospital perspective

Dr Estee Torok

Clinician Scientist Fellow and Senior Research Fellow, University of Cambridge

Monday 26 November - 15:45-16:15

The ability to perform rapid, high-throughput microbial whole-genome sequencing (WGS) using bench-top platforms represents a step-change in capabilities for diagnostic and public health microbiology laboratories. As the cost of sequencing continues to decline, the challenge will be to define how best to apply this technology in clinical microbiology. I will review the potential clinical applications of WGS such as outbreak investigation, rapid diagnosis of multidrug-resistant organisms, surveillance of antimicrobial resistance, and detection of emerging pathogens. I will also discuss the challenges of implementation of WGS in the hospital setting.

Compliance: a common challenge, a European perspective

Mrs Rosemary Gallagher

Professional Lead Infection Prevention and Control, Royal College of Nursing

Monday 26 November - 15:45-16:05

Not yet provided.

The challenges of a robust surveillance system for SSI at the local level

Dr Birgitta Lytsy

Infection Prevention and Control Physician, Uppsala University Hospital

Monday 26 November - 16:05-16:25

Surgical site infections (SSI) are costly and drive antimicrobial resistance at the population level. SSI are associated with increased mortality and considerable morbidity for the individual patient. The preventive steps to reduce the risk of SSI involves procedures pre, -intra- and postoperatively. Surgeons, nurses, anesthesiologists, hospital administrators and infection prevention and control staff must work together to prevent this complex health-care associated infection. Surveillance and feedback of rates of SSI to surgeons and administrators is a prerequisite to be successful. Surveillance of SSI is however a challenge since the infection often develops over a long-time period and is often diagnosed at a different ward level than where the operation once took place resulting in an infection going under the radar for the individual surgeon and the responsible clinic. Several surveillance systems for SSI have been proposed at the local level. Manual collection of data seems to be inevitable which is resource consuming. This session will describe a surveillance model based on compiling data over SSI rates using questionnaires sent out to each patient after abdominal, orthopedic and cardiac surgery at a Swedish university hospital.

HAI indicators in European countries

Dr Luca Arnoldo

Medical doctor, University of Udine

Monday 26 November - 16:25-16:45

In this text we explain the results of the survey, promoted by EUNETIPS in 2018, on the presence of mandatory/recommended indicators for the evaluation of healthcare associated infections prevention and control at national level in European countries.

Our purpose was to provide a real picture of the European situation; to achieve this we sent two questionnaires to EUNETIPS members, one asking for general information and one on the details of each indicator. We searched for indicators that are required/recommended by national governments, agencies, or institutions that are currently collected.

We received 16 answers from EUNETIPS countries out of the 19 that are represented in the network and we collected data of 62 specific indicators. Twelve countries answered with at least one national indicator, 2 countries only with regional indicators and 2 declared that no indicator was in use. In two countries, both with indicators currently collected, at least one was removed in the last 5 years; moreover during 2018 four countries are planning to introduce a new one, in all of these 4 some indicators are already applied.

Summarising only 75% of countries currently have indicators and countries with national indicators are the only one promoting improvement in the collection.

HAI indicators in European countries

Prof Silvio Brusaferrò

Professor of Hygiene and Public Health, University of Udine

Monday 26 November - 16:25-16:45

Not yet provided.

Operating room data for monitoring in Europe

Dr Pierre Parneix

President, French Society for Hospital Hygiene

Monday 26 November - 16:45-17:00

Nowadays no one will deny the role of the environment in cross contamination but determining in which extent remains and will remain probably an answerless question. But nevertheless many studies reported on a higher risk of acquiring bacteria from prior room occupants with a wide variety of puzzling microorganisms from *Staphylococcus aureus* to *Clostridium difficile*. In several outbreaks of healthcare associated infections improving environmental cleaning and disinfection is included in the “treatment” prescribed by infection control practitioners.

For patients cleanliness is a very important thing ranked high in their care expectation and often a symbol of quality. In the French patient satisfaction quality indicator that is public reported, the 2017 results show that 15% of patients are not satisfied with the cleanliness of their room.

An overview of European cleaning practices issued from a 2018 Eunetips survey will be displayed.

The role of the reference laboratory

Dr Catherine Arnold

Unit Head, Genomic Services and Development Unit, Public Health England

Monday 26 November - 16:15-16:45

Microbiology reference laboratories are critical for developing high-quality clinical and public health microbiology services. There are typically five core functions that they need to fulfil: Reference diagnostics; Reference material resource; Scientific advice; Collaboration and research; Monitoring, alert and response. Up to date methods to carry out these functions, including pathogen/disease characterisation, diagnostic confirmation and investigation of atypical samples are required in order to support outbreak investigations and the provision of national surveillance for early warning of unusual occurrences. Reference Microbiology in England has recently been transformed by the implementation of Whole Genome Sequencing in the place of traditionally used tests. In this presentation the trials, tribulations and triumphs of the development of a central national WGS service for Public Health England are described.

In favour of low technology

Prof Stephanie Dancer

Consultant Microbiologist, NHS Lanarkshire

Monday 26 November - 16:15-16:45

More evidence is emerging on the role of cleaning and decontamination for reducing hospital-acquired infection. Timely and adequate removal of environmental pathogens leads to measurable clinical benefits for patients. This presentation considers recent studies examining hospital decontamination technologies and evidence for cost-effectiveness.

Automated equipment does not necessarily remove all environmental pathogens and most have yet to be comprehensively assessed against patient outcome. Some studies are confounded by concurrent infection control and/or antimicrobial stewardship initiatives. Few contain data on costs. As automated devices are assumed to be superior to human effort, there is a danger that traditional cleaning methods are devalued or ignored. Fear of infection encourages use of powerful disinfectants for eliminating real or imagined pathogens in hospitals without appreciating toxicity or cost benefit. Furthermore, efficacy of these agents will always be compromised without prior removal of organic soil.

Automated devices should be compared and contrasted against physical removal of soil in standardized and controlled studies to understand how best to manage contaminated healthcare environments.

Next generation sequencing or antimicrobial resistance surveillance

David Aanensen

Director, Centre for Global Pathogen Surveillance

Monday 26 November - 16:45-17:15

Not yet provided.

Meet the expert - Challenges in faecal transplants

Prof Peter Hawkey

Professor, University of Birmingham

Tuesday 27 November - 08:00-09:00

Not yet provided.

Antimicrobial stewardship: progress and challenges

Dr Esmita Charani

Research Pharmacist, Imperial College London

Tuesday 27 November - 09:15-10:00

Antimicrobial stewardship has been associated with improved antibiotic use and reduced *Clostridium difficile* and MRSA infections in the community and hospitals. A Cochrane review found high-certainty evidence that interventions in hospitals increase compliance with antibiotic policy without increase in mortality and may reduce length of stay. Enablement, which enhances opportunity and motivation consistently increased the effect of interventions despite the fact that feedback was only used in a minority of enabling interventions. Evidence about impact on microbial outcomes was weak. Of the 221 included studies only 50 (23%) reported interventions that targeted the decision to start or stop antibiotics. We found that key details were missing from these studies, which would likely hamper any efforts to use these interventions in practice. Who should act, when, was not consistently defined, especially for interventions in continuing care wards. Only eight studies reported the impact of these interventions on total antibiotic use outside the immediate study population. Three key challenges are:

1. Understanding the complexity in antibiotic decision making in secondary care and developing contextually fit interventions
2. Identifying actors ('who') and actions ('what needs to be done')
3. Defining a balanced set of outcomes and measures of intervention effect

Antimicrobial stewardship: progress and challenges

Prof Peter Davey

Medical School Lead for Healthcare Improvement, University of Dundee

Tuesday 27 November - 09:15-10:00

Antimicrobial stewardship has been associated with improved antibiotic use and reduced *Clostridium difficile* and MRSA infections in the community and hospitals. A Cochrane review found high-certainty evidence that interventions in hospitals increase compliance with antibiotic policy without increase in mortality and may reduce length of stay. Enablement, which enhances opportunity and motivation consistently increased the effect of interventions despite the fact that feedback was only used in a minority of enabling interventions. Evidence about impact on microbial outcomes was weak. Of the 221 included studies only 50 (23%) reported interventions that targeted the decision to start or stop antibiotics. We found that key details were missing from these studies, which would likely hamper any efforts to use these interventions in practice. Who should act, when, was not consistently defined, especially for interventions in continuing care wards. Only eight studies reported the impact of these interventions on total antibiotic use outside the immediate study population. Three key challenges are:

1. Understanding the complexity in antibiotic decision making in secondary care and developing contextually fit interventions
2. Identifying actors ('who') and actions ('what needs to be done')
3. Defining a balanced set of outcomes and measures of intervention effect

Introduction

Dr Oliver Kacelnik

Department for Infectious Disease Epidemiology, Norwegian Institute of Public Health

Tuesday 27 November - 10.45-11.00

Are the Nordic countries special? The Nordic region has a reputation for being amongst the best in the world at Infection prevention and control and tackling the threat of antimicrobial resistance. We will give an introduction to this exciting region, discuss whether the reputation is deserved. I will place our countries activities in a geopolitical context and consider what the differences and similarities between the countries tell us about achieving sustainable goals in IPC and AMR.

Recommendations from the working party

Dr Pauline Jumaa

Consultant Microbiologist, Lancashire Teaching Hospitals NHS Foundation Trust

Tuesday 27 November - 11:45-12:15

Since 2012 a working party of the British Burn Association and The Healthcare Infection Society has been developing best practice guidelines for Infection Prevention and Control in burn care. Since the working party was set up, burn patients have become increasingly recognised as a potential reservoir for multidrug-resistant (MDR) organisms, which can spread to other patient groups in the hospital. The strategies for infection prevention and control in burn patients include incorporating the unique clinical characteristics of burn patients including their susceptibility to infection and the design of departments providing burn care. The design of departments providing burn care has key roles in preventing infection in burn patients and preventing the spread of infection from burn patients. Segregation of burn patients from other patient groups is key to prevent the spread of MDR organisms in the hospital. The quality of evidence for infection prevention and control strategies in burn patients is generally of low quality reflecting the challenges of designing studies in a highly specialised group of patients where standardised definitions of infection are lacking. Many strategies remain controversial. The working party recommendations are based on current experience and what is considered best practice at the time of writing.

Healthcare associated pneumonia – too little, too late?

Prof Jacqui Reilly

Lead consultant for HAI, AMR and IPC, Health Protection Scotland

Tuesday 27 November - 10:45-11:15

Healthcare-associated pneumonia (HAP) causes a considerable burden of disease in the European Union/European Economic Area (EU/EEA), much of which is preventable. Several point prevalence surveys (PPS) that assessed HAP prevalence, have been conducted in Europe and internationally; however, their methods differed. For example, some PPS did not specify the number of intubated patients, a group known to be at increased risk for HAP, while others reported cases of lower respiratory tract infections rather than pneumonia, these differing definitions and methods limit comparability across PPS.

The European Centre for Disease Prevention and Control (ECDC) PPS of HAIs and antimicrobial use in EU/EEA acute care hospitals from 2011–12 applied a standardised methodology for the surveillance of HAIs, including HAP, throughout the EU. Recent analysis of the findings in the last EU PPS indicates HAP was present in 2,902 patients resulting in a prevalence of 1.3% (95% CI: 1.2–1.3%) among hospitalised patients in acute care hospitals in Europe.

Debate: National surgical site infection surveillance - friend or foe?

Miss Pauline Harrington

SSI Surveillance Manager, Public Health England

Tuesday 27 November - 10:45-11:45

The national Surgical Site Infection (SSI) Surveillance Service (SSISS) in England has been in existence for 21 years and is one of the most comprehensive SSI surveillance systems in Europe. Over 200,000 records are submitted to SSISS each year for seventeen categories of surgery. The service provides hospitals with an infrastructure to conduct surveillance and assess their SSI risk. Hospitals can identify opportunities for improvement through monitoring their SSI risk over time and comparison to a national benchmark. Hospitals receive ongoing support from SSISS and are encouraged to share best practice with peers. Comprehensive quality assurance processes and bespoke training are provided by SSISS to enhance data consistency and quality between hospitals. The surveillance and service have developed over the years with stakeholder engagement key to this process. Through working in partnership with participating hospitals we continue to develop SSISS to ensure we maximise the public health utility of data collected and ultimately improve patient outcomes.

Debate: National surgical site infection surveillance - friend or foe?

Dr Peter Jenks

Director of Infection Prevention and Control, Plymouth Hospitals NHS Trust

Tuesday 27 November - 10:45-11:45

Surgical site infection (SSI) is the third commonest healthcare-associated infection (HCAI) and causes substantial morbidity and mortality to patients who have undergone surgical procedures. Despite the success in some areas of HCAI prevention, most notably the fall in incidence of MRSA bacteraemia and *Clostridium difficile*, and the existence of evidence-based guidelines for the prevention of SSI, a reduction of wound infection rates has not occurred. The provision of accurate and complete surveillance data is key component of effective programmes aiming to reduce rates of wound sepsis. Given that there is a growing demand from patients, professionals and commissioners for improvements in surgical outcomes, it is essential that there is confidence in how these rates are reported. A number of studies have raised concerns about the quality and reliability of data produced by the national surveillance programme and its usefulness for benchmarking purposes. Others have highlighted the risk that it is being used to draw erroneous and potentially damaging conclusions.

Nordic antibiotic stewardship - an example to follow?

Professor Niels Frimodt-Møller

Head of Department, Clinical Microbiology, Denmark

Tuesday 27 November - 11.00-11.25

Not yet provided.

What about animals? A Nordic perspective

Dr Karin Bergström

Deputy State Veterinarian, PhD, National Veterinary Institute

Tuesday 27 November - 11.25-11.50

The situation in the Nordic countries regarding antibiotic resistance in animals is generally favourable. Why so? Perceptions of possible causes and measures have been compiled from experts in Denmark, Finland, Norway and Sweden. The four core pillars are analogous, while details may differ. The talk will contain some degree of speculation, as causality is difficult to prove; often several actions have been taken to mitigate a rising threat. The following, important topics will be discussed. Prudent use of antibiotics and IPC relies on four pillars: surveillance, prevention, rational use, education.

Resistant bacteria and IPC; is there a Nordic way?

Dr Egil Lingaas

Head of Department of Infection Prevention, Oslo University Hospital

Tuesday 27 November - 11.50-12.15

Not yet provided.

Aetiology of HAP

Dr Vicky Ewan

Consultant in Geriatric Medicine, South Tees NHS Foundation Trust

Tuesday 27 November - 11:15-11:45

Hospital acquired pneumonia (HAP) is defined as a respiratory infection which results in new radiologically visible infiltrates, after 48 hours of admission to hospital. The non-ventilated hospital population at risk is predominantly older, frail and characterised by multimorbidity. In this talk we'll explore the interplay of risk factors which can lead to HAP. HAP occurs because of microaspiration of the patients' own oropharyngeal material. Potential respiratory pathogens occur more commonly in the mouths of those who are unable to mechanically clear their oral secretions, a situation seen in patients with dysphagia or a reduced level of consciousness. Thus impaired swallow has two steps. Firstly, organisms are not cleared effectively into the stomach due to reduced mechanical clearance of saliva. Secondly, this stagnant oral material is then misdirected into the lungs, (microaspiration). Once aspirated, the host immunity may not be capable of reacting in a sufficiently vigorous manner to the altered microbiota, and infection occurs. Thus HAP occurs due to infection developing from endogenous microbiota, rather than person-to-person transmission. As the ageing population represents an increasing proportion of the hospital case-load, understanding the aetiology of HAP will allow us to initiate preventative strategies to reduce the burden of disease.

Preventing spread of multi-resistant pathogens in burns units

Dr Louise Teare

Consultant Microbiologist, Mid Essex Hospital Trust

Tuesday 27 November - 11:15-11:45

Between 16.12.17 and 29.03.18 five cases of multi-resistant *Acinetobacter baumannii* OXA-23, OXA-51 (MRA) occurred on our burns intensive care unit, three were imported and two acquired. Both acquired strains and two of the imported strains were identical. Because we were confident that contact precautions and cleaning processes were optimal from before imported cases arrived, we sought other explanations as to how acquisition occurred. A different mechanism was identified in each case.

The first case was explained by bacteria generated during theatre activity when operating on an MRA case. The positive air pressure allowed MRA to gain access to communal areas. Here bacteria had the potential to settle out onto surfaces that could, via a variety of routes, come into contact with other patients. Environmental sampling supported this hypothesis. This mechanism of transfer could not explain the second case because no MRA case was operated on in the relevant time period. Noting a systematic review indicating that admission to a room previously occupied by a patient infected and/or colonized with a specific pathogen is a risk factor for acquisition, we found that even after optimal cleaning and fogging, there were still a couple of 'Trojan Horses' in the room. The outbreak investigation led to an understanding of the transfer mechanism in each case and systems were put in place to avoid recurrence.

Development of a practical tool for SSI reporting by patients or observers

Ms Rhiannon Macefield
Senior Research Associate, University of Bristol

Tuesday 27 November - 11:45-12:15

Accurate measurement and monitoring of surgical site infections (SSIs) is challenging, exacerbated because most SSIs present after the patient is discharged. Existing tools to aid diagnosis have been designed primarily for use in hospital, lack patient input and have not been formally validated. This talk describes the development and validation of a tool suitable for patient self-report and/or observer (healthcare professional; HCP) completion for SSI assessment for closed primary wounds. Analysis of existing tools (CDC and ASEPSIS) and interviews with patients and HCPs (n=19) informed the content of the new tool. Further interviews (n=42) tested understanding, accuracy and acceptability with improvements made as an iterative process. Reliability and validity was examined in a large field-testing study of 792 abdominal surgery cases.

The 16-item tool was found to be comprehensive, acceptable and easy to complete by patients and HCPs. Field-testing demonstrated good response rates and low levels of missing data, with good test-retest reliability and agreement between patients and observers. The tool demonstrated high sensitivity and specificity for SSI discrimination compared to a face-to-face reference diagnosis. It is recommended for post-discharge assessment of closed primary wounds after abdominal surgery, for use as an outcome measure in trials and in routine surveillance.

Topical antimicrobials in prevention and treatment of burn wound infection

Naiem Moiemem

Consultant Surgeon in Burns and Plastics, Queen Elizabeth Hospital

Tuesday 27 November - 10:45-11:15

Sepsis is the main cause of death for our burn patients. Skin loss with the presence of devitalised tissues are favourable media for wound colonisation with microbes that are out of reach of systemic antibiotics. This can lead to wound infection and systemic invasion causing sepsis. The invention of topical antimicrobial following WWI has been a step change in the management of burns and saved many lives.

Today with the development of Multi Drug Resistant organisms, prevention of wound infection using topical antimicrobial is the main strategy to prevent infection and sepsis. Swift early detection of the colonising wound microbes with sequencing help targeting such organisms before they can cause harm. Furthermore, as current burn wound dressings can be unaffordable specially in Resource Limited societies, search for cheap and non-toxic topical antimicrobial is important. A new step change in topical management of burn is desperately needed.

Opportunities for HAP reduction

Prof Miles Witham

Professor of Trials for Older People, Newcastle University

Tuesday 27 November - 11:45-12:15

Interventions to reduce Healthcare acquired pneumonia (HAP) outside critical care areas have received little attention to date; few evaluations and even fewer trials have been done. Given the wide range of aetiological factors that contribute to nvHAP, there are several classes of intervention that could potentially be tested in trials to reduce nvHAP rates.

Interventions can be broadly grouped into those that alter oropharyngeal microbial flora; those that alter immune function, and those that alter other innate protective mechanisms. Examples that require further study are early mobilisation and other interventions to prevent atelectasis, deprescribing of medications (e.g. proton-pump inhibitors, steroids, anticholinergics, antibiotics), oral hygiene interventions, and interventions to identify and mitigate the risk of aspiration. Institution-level changes including systems to more accurately diagnose and record nvHAP are also likely to be needed.

Effective interventions will be simple, inexpensive, deployable at scale, carry minimal harms, and will integrate easily into existing care pathways. It is likely that there will be significant overlap between interventions that reduce nvHAP and things that we already view as good basic medical and nursing care for older people, but packages of interventions should still be tested in pragmatic RCTs to ensure efficacy and to drive uptake.

How to select a room disinfection system for your hospital

Dr Alan Beswick

Principal Scientist - Microbiology, Health and Safety Executives Laboratory

Tuesday 27 November - 13:45-14:10

Automated Room Decontamination Device (ARDD) is a broad term used to describe machines that offer some form of whole room disinfection treatment, but these are not typically designed to be used in isolation. This is because surfaces such as floors, tables, wash areas and toilets still require physical cleaning to remove soiling and to make them 'look' acceptably clean.

ARDD can assist infection control activities within the hospital setting by adding an extra layer of hygiene to existing cleaning and disinfection procedures. They may be used for routine 'maintenance' treatments that have the ability to overcome human cleaning oversights and/or to treat areas that may not otherwise receive regular cleaning attention. Alternatively, when used at higher intensity some of these systems may offer effective interventions during infectious disease outbreak situations.

This presentation will consider both fumigation and UVC systems; their advantages and disadvantages in use. The limitations of ARDD treatments and the importance of validating the devices for their intended use will be explored. The presentation will seek to provide an insight in to the expectations we should have of ARDD machines, and what hospital managers might need to consider prior to purchasing or hiring them.

Sporicides and how to test them

Prof Jean-Yves Maillard

Professor of Pharmaceutical Microbiology, Cardiff University

Tuesday 27 November - 14:10-14:35

Bacterial endospores (spores) are less susceptible to various disinfection and sterilization processes than vegetative bacteria and other microorganisms such as viruses, protozoa and fungi. The intrinsic resistance of bacterial spores to disinfection and sterilization processes can be explained by a number of determinant factors related to their specific structure: the presence of (a) spore coat(s), the low water content of the spore core, the highly compressed spore membrane and the presence of small acid soluble proteins protecting the spore nucleic acid. The highly resistant characteristic of spores causes issues in healthcare settings where *Clostridium difficile* (*C. difficile*), a major cause of hospital-acquired infection, produces spores that can persist in the environment for months despite disinfection interventions. Sporicidal efficacy is usually achieved after an exposure time of several minutes with a high concentration of a biocide. There is some variability in sporicidal efficacy depending on the bacterial species, although clinically relevant pathogens such as *C. difficile* and *Bacillus anthracis* spores are not necessarily less susceptible than spores from other clostridial or bacilli species.

Currently a number of quaternary ammonium- based formulations claims to be sporicidal, notably against *C. difficile* spores. A closer look at the composition of such formulations, the test methodologies used, or the conditions of use of these products in practice, highlights a general lack of understanding of spore testing or spore susceptibility to biocides.

Failure to use appropriate sporicides to control endospores on surfaces will provide a false reassurance to the end users and put staff and patients at risk.

This presentation will aim to (i) review current knowledge on biocides activity against bacterial endospores, (ii) explain bacterial spore resistance to biocides and (iii) discuss sporicide testing and pitfalls.

Enhanced room disinfection (to include multi-resistant organisms and *Clostridium difficile*)

Dr Curtis Donskey
Hospital Epidemiologist, Cleveland Veterans Affairs Medical Center

Tuesday 27 November - 14:35-15:00

Not yet provided.

Prophylaxis and treatment of meticillin resistant *Staphylococcus aureus* (MRSA) in the United Kingdom

Dr Nicholas Brown

Consultant Medical Microbiologist, Cambridge University Hospitals NHS Trust

Tuesday 27 November - 15.45-16.15

The first UK guidance on the prophylaxis and treatment of MRSA based on a comprehensive literature review was published in 2006. This was updated in 2008. At this time, the prevalence of MRSA in hospitals had started to fall, yet more than half of *Staphylococcus aureus* (*S. aureus*) blood stream infections were still caused by MRSA in some hospitals. In addition, while MRSA had previously been considered a hospital problem, community strains of MRSA with high virulence had been described. Specific guidelines for the management of community acquired MRSA were published in 2010. Much has changed in the intervening time, including observed changes in the nature, incidence and epidemiology of MRSA infections. Also, for reasons that are unclear, community strains of MRSA such as USA300 have not become particularly common in the UK, despite frequent introductions. While there is a dearth of new antibiotics coming to market, agents such as linezolid and daptomycin had limited clinical use when the 2008 guidelines were written. Also, some newer agents had just been licenced or were close to market. This review will review the new evidence together with the existing recommendations in the 2008 guideline to see if these need modification.

Prediction of healthcare-associated infections in an intensive care unit using machine learning and big data tools

Dr Cristina Soguero-Ruiz

Assistant Professor, Rey Juan Carlos University

Tuesday 27 November - 15:45-16:10

Data-driven Systems Based on Machine Learning Methods and Big Data methods Techniques to Characterize the Evolution and Transmission of HAIs.

Healthcare-associated infections (HAIs), are infections that patients get while receiving medical or surgical treatment in a healthcare facility. HAIs are a major cause of morbidity and mortality nowadays. Specifically, about 30% of Intensive Care Unit (ICU) patients in Europe are affected by at least one episode of HAI.

We use and develop data-driven systems based on machine learning methods and massive data techniques to characterize the evolution and transmission of HAIs. Based on these tools, we will predict the appearance and transmission of multi-resistant bacteria within ICU environment. Furthermore, we will present a framework for detection of surgical site infection and analyze obtained results.

Rapid detection of carbapenemases

Dr David Wareham

Clinical Senior Lecturer, Barts and London School of Medicine and Dentistry

Tuesday 27 November - 15:45-16:05

There is an urgent clinical need for the accurate and timely detection of carbapenem resistant (CRO) and carbapenemase producing (CPO) organisms. There are multiple phenotypic and genotypic methodologies available to diagnostic laboratories, able to inform treatment and infection control decisions. This symposium will provide an overview of the strengths and weakness of currently available technologies and how they might be implemented within local and national CRO screening strategies.

Changes to prevalence and epidemiology of MRSA in the United Kingdom

Prof Angela Kearns

Head of Staphylococcus Reference Service, Public Health England

Tuesday 27 November - 16.15-16.45

Almost 60 years following its first description, the emergence and dissemination of MRSA remains a public health concern worldwide. Effective control of MRSA is challenging, compounded by not only an expansion in diverse ecological reservoirs (healthcare, community and animals) but also the emergence of novel clones encoding different *mec* genes and a newly described (sub-) species (*Staphylococcus argenteus*).

Nevertheless, a raft of measures implemented during the early 2000s led to a marked decline in MRSA rates in England from 40% in the early 2000s to 6.6% in 2017/8. In parallel with this downward trend, there has been a marked shift in the molecular epidemiology of MRSA in the UK. Whilst hitherto dominant HA-MRSA clones (EMRSA-15 and -16) have declined, high-resolution techniques such as whole-genome sequencing have provided detailed insights into the incursion of multiple disparate clones from different geographic regions of the world, variably linked with travel, migrants and/or multi-drug resistance, and provided evidence for the emergence and expansion of particular clones in some marginal populations.

Dynamic changes in MRSA internationally across the one health landscape means that continued vigilance is warranted if the declining MRSA rate in the UK is to be sustained.

Culture methods for detection of CRO

Prof John Perry

Clinical Scientist, Newcastle Upon Tyne Hospitals

Tuesday 27 November - 16:05-16:20

A variety of culture methods are possible for detection of carbapenem-resistant organisms (CRO). This speaker will argue that reliable detection of *Enterobacteriaceae* that produce carbapenemases (CPE) is of paramount importance rather than detection of any CRO. For detection of CPE from stool samples or rectal swabs, chromogenic culture media that are specifically designed for detection of CPE are recommended. Conversely, the use of non-selective culture media in conjunction with antibiotic discs should be avoided due to a lack of sensitivity. No culture medium is completely specific for detection of CPE and even the best media can only be used in conjunction with appropriate confirmation tests. The relative attributes of various confirmation tests will be briefly discussed as will the possible role of broth enrichment.

Using a machine learning-based and rule-based approach on electronic patient records to detect healthcare-associated infections

Prof Hercules Dalianis
Professor, Stockholm University

Tuesday 27 November - 16:10-16:35

Over ten percent of all in-patients today obtain an healthcare-associated infection (HAI), this causes a lot of suffering for the patients and immense costs for the society. Healthcare managers cannot easily obtain statistics of the level of HAI in each clinic so they can put actions to prevent HAI. In this talk is explained what an HAI is and how one can detect it using both textual information and structured data from the patient record. An approach using a combination of manually classified electronic records written in Swedish including its corresponding structured data such as drug use specifically antibiotics, body temperature and microbiological values as training data. Both Support Vector Machine and Gradient Tree Boosting machine learning methods were used in addition to a number of pre-processing steps for the classification. The best results in detecting HAI with respect to high recall is with the Gradient Tree Boosting, where 93.7 percent recall and 79.7 percent precision were obtained.

The talk will also describe a rule-based approach where sepsis and urinary tract infections are detected.

Rapid molecular screens vs conventional agar

Ms Janet Hindler

Clinical Microbiology Consultant, UCLA Medical Centre

Tuesday 27 November - 16:20-16:40

Carbapenem resistant organisms (CRO) screening - Rapid molecular screens vs conventional agar... One of the first steps in confronting the challenge of carbapenem resistance in Gram-negative bacteria involves the clinical laboratory where reliable methods to detect CRO are employed. The variety of test methods available at the core can be divided into molecular methods that detect antimicrobial resistance genes and culture methods using agar plates with or without a companion broth medium. Molecular methods that screen for common types of carbapenemase genes are rapid, easy to perform and are more sensitive than culture methods. However, these methods will only detect specified gene targets (may miss variants of common carbapenemase genes) and can be costly. In addition, the presence of a gene does not always correlate with phenotypic resistance as currently defined and culture will also be needed to recover isolates for PFGE/WGS in outbreak settings. Conventional agar culture methods are coupled with tests to confirm CRO and/or carbapenemase production in suspicious colonies and require considerable skill and several days to result and are not highly standardized. Conventional culture methods can, however, lead to identification of novel carbapenemase genes. This talk will examine the value of rapid molecular screens versus conventional agar culture for detection of CRO.

Movement of patients in a hospital network and development of antibiotic resistance

Prof Gianpaolo Scalia Tomba
Professor, University of Rome Tor Vergata

Tuesday 27 November - 16:35-17:00

The network of patient movements within and between hospitals in Norway (Region South-East) during the year 2012 has been analysed. Various results about frequency of hospital contacts, duration of stays, movements within and between hospitals during a whole year in a region with approximately 2.9 M inhabitants will be presented. Some possible models for spread of infections between nodes in this network will be discussed, with focus on healthcare associated infections.

Selecting a new screening test for carbapenem resistant organisms

Prof Thierry Naas

Associate Professor, Paris-Sud University

Tuesday 27 November - 16:40-17:00

The spread of carbapenemase-producing *Enterobacteriaceae* (CPE), represents a serious threat for public health, and requires their rapid identification to implement proper infection control measures to prevent further spread in hospitals, and to initiate proper treatments. This rapid identification relies on accurate and fast diagnostic tests.

Being able to infer from the routine antibiogram the presence of a carbapenemase is often complicated, and requires complementary tests, leading to additional delay and cost for clinical laboratories. Accordingly, several algorithms to discriminate non-CPEs from those that require complementary testing have been proposed with however only moderate interest.

During the last four years, several methods have been developed for the rapid detection of CPEs including (i) tests able to detect a carbapenem-hydrolyzing activity (Carba NP test and derivatives, MALDI-TOF protocols, BYG test, CIM test and derivatives, β -CarbaTM, (ii) immuno-chromatographic tests for the rapid detection of the main 5 carbapenemases, (iii) combination discs diffusion assays, and (iv) molecular based techniques that aim to detect the most widespread carbapenemase-encoding genes. None of these tests is perfect, and the knowledge of their limits, and of the local epidemiology, are prerequisites for their proper usage.

Bringing genome sequencing and bioinformatics into hospital epidemiology

Dr Esther Robinson

Lead Public Health Microbiologist, Public Health England

Wednesday 28 November - 08:00-09:00

Mycobacterial infection, including TB, is a significant clinical and public health problem in England, although TB rates are falling. Improving diagnostics for tuberculosis is a key aim of both the PHE-NHS England collaborative strategy for TB 2015-20 and the WHO End-TB strategy, with better testing for anti-tuberculous drug resistance a priority.

Whole-genome sequencing of mycobacteria offers significant advantages over other diagnostic methodologies, with rapid, single-assay results on mycobacterial species, resistance prediction and relatedness. WGS is now routinely used for all mycobacterial isolates sent to Public Health England and the data used to guide routine clinical care.

WGS-based TB relatedness provides much greater resolution than other typing methods. This can be used to rule out likely transmission, and also to reveal unsuspected transmission events. Examples of these results now guiding healthcare infection control and public health interventions in routine practice are used to illustrate this talk. The growing challenge of non-tuberculous mycobacteria is also becoming tractable to WGS-based diagnostics with significant implications for healthcare infection control.

Bringing genome sequencing and bioinformatics into hospital epidemiology

Dr Adam Witney

Senior Bioinformatics Scientist, St George's University of London

Wednesday 28 November - 08:00-09:00

Whole genome sequencing has been shown to provide a rapid and comprehensive view of the genotype of the organism and thus enable reliable prediction of the drug susceptibility phenotype within a clinically relevant time frame. In addition it provides the highest resolution when investigating transmission events in possible outbreak scenarios. WGS can therefore play a crucial role in the early identification of transmission events and therefore direct infection control teams to better target interventions. Furthermore, high resolution genotype information can enable a better understanding of how organisms move around hospital units such that preventative measures can be implemented to reduce the risk of transmission and outbreaks occurring. However, robust software and database tools need to be developed for the full potential to be realized.

Meet the expert - challenges in decontamination of robotic instruments

Prof William Rutala

Research Professor of Medicine, UNC School of Medicine

Wednesday 28 November: 08:00-09:00

Not yet provided.

Infection prevention training for development and launch

Dr Nichola Ashby

Professional Lead for Education, Royal College of Nursing

Wednesday 28 November - 08:00-09:00

Infection Prevention and Control Module: An Educational Development by the Royal College of Nursing

Theme

Rationale:

The Royal College of Nursing Charter includes a requirement for the provision of an educational institution for the purposes of furthering the better education of the nursing profession. Such an institute will work to promote the science and art of nursing and education and training in the profession of nursing (RCN Charter, 2013).

In response to membership and service demand, nationally and internationally renowned clinical and educational experts have developed an innovative introductory education module in Infection, Prevention and Control. The delivery of education at the RCN provides a platform for the development of a high quality portfolio of modules.

Methods:

Working within the RCN Strategic Plan (2013) the need for development of a new approach to module education for nurses was identified to provide an innovative, efficient and impactful approach to lifelong learning. The module development has focused on Linking existing UK expertise and resources with the RCN to deliver a blended approach to learning

The principles of care delivery, critical appraisal of theory and practice, leadership and evaluation are delivered by a network of national specialists providing expertise in microbiology, specimen management and governance.

Implementation:

The delivery of 200 hours of learning is provided through a variety of approaches and resources. These consist of a pre-module learning on line day which supports the learner to progress through the content, work based learning, portfolio development and service improvement. A further three taught days, are underpinned by further online delivery. The student also uniquely has a 'coach' provided to support them throughout their attendance over 6 months. Achievement of a progressive practice based portfolio underpins the development of a service improvement report where the student can demonstrate their learning and practice improvement. Each student develops a comprehensive specialist portfolio to demonstrate their learning and achievement which links to the NMC revalidation expectations.

Conclusion:

To ensure the continuing development of this provision clear evaluation is undertaken throughout the programme. The students learning remains contemporary and the development of networks, innovative practice and self-reflection is underpinned by a robust high quality education provision. The Royal College of Nursing (2013) Strategic Plan 2013-2018

Authors :

Dr Nichola Ashby

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Isolation and potential harm

Dr Neil Wigglesworth

Deputy Director in Infection Prevention and Control Directorate of Infection, Guy's and St Thomas' NHS Foundation Trust

Wednesday 28 November - 09:15-09:30

Isolation in single rooms as part of transmission based precautions (TBP) is a mainstay of infection prevention and control practice, but is not without its controversies. Single room isolation in the context of airborne precautions and to some extent droplet precautions is uncontroversial; however the efficacy of single room isolation in combination with contact precautions in preventing transmission remains contested. A further presentation in this symposium will discuss the evidence base for isolation. Many will argue that the precautionary principle should be applied in this context, i.e. isolate despite the debate in the literature, but that assumes that single room isolation is a benign procedure. There is a considerable body of evidence that single room isolation can lead to considerable harm and adverse patient outcomes. These include depression and other effects on psychological wellbeing, sub-optimal care, including a reduction in healthcare worker contact, and adverse events such as falls. It is therefore necessary to consider the ethical and risk issues associated with isolation. This presentation will summarise the evidence of isolation associated harm to date.

Influenza vaccines

Prof Maria Zambon

Deputy Director National Infection Service, Public Health England

Wednesday 28 November - 09:15-09:40

Over 14 million individuals are vaccinated against influenza in the UK every year, using a variety of different vaccines. Future vaccine campaigns from winter of 18/19 onwards will include increasing diversity of vaccines targeted at different population segments, making the landscape of influenza vaccines even more complex. Despite successes at increasing vaccine coverage and improvements in surveillance to detect variations in circulating strains, there remain significant challenges in predicting which are the best vaccine strains to use and optimising the effectiveness of current vaccines used in children and the elderly. Strengths, limitations and scientific solutions for seasonal vaccines for the elderly and children are discussed. Although universal influenza vaccines remain a fitting aspiration for influenza control, they are some years away, whereas incremental improvements in seasonal influenza are a necessity. Making best use of the available vaccines is an important public health measure.

Healthcare-associated *Clostridium difficile* infections: Antibiotic use is the most important factor - Against the motion

Dr Jon Otter

Epidemiologist in HCAI and AMR, Imperial College London

Wednesday 28 November - 09:15-10:00

Not yet provided.

Healthcare-associated *Clostridium difficile* infections: Antibiotic use is the most important factor - For the motion

Prof Mark Wilcox

Consultant and Head of Microbiology Research and Development, Leeds Teaching Hospitals NHS Trust

Wednesday 28 November - 09:15-10:00

Not yet provided.

Glove use and abuse

Prof Jennie Wilson

Associate Professor in Healthcare Epidemiology, Richard Wells Research Centre, University of West London

Wednesday 28 November - 09:30-09:45

The hands of healthcare workers have been acknowledged as a key vehicle for the transmission of healthcare-associated infections (HCAI). There is evidence that they acquire transient micro-organisms through touch and that these are readily transferred onto other surfaces and to patients. Prior to the emergence of AIDS in the early 1980s, the availability of gloves in healthcare settings was limited and mostly focused on sterile gloves for invasive procedures. The introduction of standard precautions recommends that personal protective clothing is used for direct contact with blood and body fluids on the basis that these may be heavily contaminated with pathogenic organisms. However, there is now emerging evidence that non-sterile clinical gloves are frequently over-used and mis-used and expose patients to significant risks of endogenous and exogenous infection. The perception that 'magic gloves' protect both the HCW and the patient may neutralise conventional triggers for hand hygiene and thereby increase the risk of transmission of HCAI. In addition, changing attitudes of healthcare workers to patients, touching and risk to self, as well as organisational factors that both promote the use of gloves and suggest that hand hygiene is inadequate, may be key factors in driving unsafe glove-use. This presentation discusses research evidence related to the use and misuse of clinical gloves.

Vaccines for RSV and other respiratory tract viruses

Dr Simon Drysdale

NIHR Academic Clinical Lecturer in Paediatric Infection and Immunity, University of Oxford

Wednesday 28 November - 09:40-10:00

Respiratory syncytial virus (RSV) infection is the most important cause of hospitalisation in infants and, after malaria, is the leading global cause of infant mortality, with up to 200,000 deaths attributable to RSV in infants 1-12 months old. It is also associated with significant morbidity and mortality in older adults. Its prevention through vaccination is, therefore, a public health priority. Apart from the humanised monoclonal antibody palivizumab, which is only indicated in the most high-risk infants due to its very high cost, there are currently no licensed prophylactic agents against RSV infection although several are in the pipeline. The development of vaccines for other common respiratory viruses including human metapneumovirus and parainfluenza viruses are also in development.

Isolation (suspect the evidence base)

Prof Dinah Gould

Professor of Nursing, Cardiff School of Healthcare Service

Wednesday 28 November - 09:45-10:00

Isolating infectious patients is essential to reduce infection risk. Effectiveness depends on identifying them, transfer to suitable accommodation and maintaining precautions. We undertook an exploratory questionnaire study to determine how infectious patients are identified, transfer and challenges maintaining isolation in hospitals in the UK.

Forty nine responses were obtained. In a typical acute NHS trust 100-200 patients need isolating to contain infection every month. Decision to isolate is usually taken jointly between infection prevention teams, clinicians (mostly nurses) and staff responsible for bed management based on risk assessment, symptoms, histories from patients/families (e.g. recent overseas travel), availability of accommodation, alerts on patients' records and occasionally by applying an isolation prioritisation tool. Respondents reported situations where isolation was not possible because of the patient's physical condition or cognitive status. Very sick patients and those with dementia were not thought to tolerate isolation well. Patients were informed about need for isolation by ward nurses, sometimes with additional explanation from infection prevention teams. Explanations were often poorly received and comprehended, fuelling complaints. Respondents were aware of ethical dilemmas associated with isolation undertaken in the interests of other health service users and society. Organisational failures could delay instigating isolation. Records were kept of demand for isolation and/or uptake but quality was variable. Isolation has received greatest attention in countries with under-provision of accommodation. Our study demonstrates reasons for delays identifying patients and isolation failure placing others at risk that apply in any organisation regardless of availability and highlights ethical dilemmas of enforcing isolation.

Control of norovirus infections

Dr David Allen

Assistant Professor in Virology, London School of Hygiene and Tropical Medicine

Wednesday 28 November - 10:45-11:15

Enteric virus infections associated with gastroenteritis are common among humans. Whilst illness is usually mild and self-limiting, viral gastroenteritis causes substantial morbidity in the population: in particular, that associated with norovirus which has an estimated incidence in the UK community of three million cases each year. Norovirus also causes outbreaks of gastroenteritis in healthcare settings which can complicate patient management, increase hospital stay times, has substantial economic cost and is a cause of excess mortality in these settings.

The plasticity of the norovirus genome and error-prone nature of its replication allows for the generation of genetically diverse populations of viruses co-circulating, and selective pressure (e.g. from population-level immunity) drives selection and the periodic emergence of novel strains which can cause pandemic spread of norovirus-associated gastroenteritis over a single winter season. Public health agencies worldwide employ surveillance systems – generally reliant on partial genome sequencing – to monitor circulation of norovirus strains, and collection of linked epidemiological data on cases and outbreaks. However, epidemiological data can often be incomplete, and understanding of how genomic markers relate to phenotypic traits of the virus is incomplete. This presentation will review current understanding of the burden of norovirus gastroenteritis and the molecular epidemiology of norovirus strains, how surveillance systems are used in public health responses (e.g. to control outbreak events) and will explore future perspectives for developing surveillance systems using emerging technologies to improve understanding of the emergence and spread of norovirus strains, particularly those that become associated with pandemic activity.

Gram-negative bacteraemias: what do the data tell us?

Dr Russell Hope

Head of Bacteraemia and CDI Surveillance Section, Public Health England

Wednesday 28 November - 10:45-11:15

Gram-negative bacteria are a major cause of bacteraemia in England, accounting for approximately half of all bacteraemias. *Escherichia coli* (*E.coli*) alone accounts for one in four bacteraemias, and the number of cases has been increasing year-on-year. In financial year 2017/18 there were 41,060 *E. coli* bacteraemia cases, giving a rate of 74.3 cases per 100,000 population. These *E. coli* infections alone cost NHS hospitals an estimated £53 million pounds and patients with these infections were ten times more likely to die than those without. Although antibiotic resistance remains proportionally low in these infections, their high infection incidence means that they present a relatively large resistance burden. For example, in 2017 there were approximately 4,000 *E. coli* bacteraemia cases caused by strains resistant to cephalosporins; in contrast there were only 800 MRSA bacteraemia cases over the same time period. Reducing the incidence of Gram-negative bacteraemia is now a UK government ambition. To support this strategy, PHE has been tasked to implement enhanced surveillance of the infections, with a focus on collecting risk factor data, to help inform action. This presentations gives a brief overview of the of the surveillance data to date.

Engineering solutions to airborne infection

Prof Catherine Noakes

Professor of Environmental Engineering For Buildings, University of Leeds

Wednesday 28 November - 10:45-11:15

Transmission of infection is conventionally regarded as either a human behaviour or a medical challenge, yet the process can also be influenced significantly by the environment. This is particularly the case for airborne transmission of infection where the physical passage of microorganisms in the air depends on the airflow characteristics, and their survival depends on the environmental conditions. Environmental design has long been advocated as a key part of controlling airborne infection, yet there are numerous challenges in establishing what are the right technologies and approaches, and in understanding how effective the measures might be.

This talk considers how experimental, computational and risk modelling approaches can be applied to both understand the mechanisms for airborne infection in indoor environments, and to evaluate the effectiveness of design solutions. Examples from several research studies are presented to demonstrate the considerations in different types of hospital environments and to quantify the benefits and limitations of ventilation strategies and air disinfection technologies. The talk discusses how research findings may be used to support practice, and where there are needs for further research to both understand fundamental processes and the real performance of engineering solutions.

Hepatitis E virus

Prof Richard Tedder

Head of Blood Borne Virus Unit, Public Health England

Wednesday 28 November - 11:15-11:45

Hepatitis E virus infections in England are dynamic in the population suggesting fluctuations in risk over time. Parallel molecular characterisation indicate genotype 3 virus to be linked to indigenous infections with analysis indicating two phylogenetically distinct groups. What influences fluctuations in disease prevalence is unclear but the year on year increase in case numbers noted since 2010 appears to be linked to the emergence of a novel HEV phylotype. Case control studies using food based questionnaires show an association between the consumption of pork products and HEV infections in England.

The public health remit for HEV has changed following the description of persistent, chronic hepatitis E across a range of immunosuppressed groups. Concern remains that these infections remain largely undiagnosed with a recent audit in transplant recipients indicating HEV prevalence of 0.67%. Whilst treatment with Ribavirin does result in viral clearance, viral relapse is increasingly recognised and treatment options for individuals with persistent hepatitis E remain limited. Evidence of transmission from HEV containing blood products raised critical questions for blood safety and has led to the introduction of donation and donor screening.

Wash hand basins/sinks - good or bad design?

Dr Michael Weinbren

Consultant Microbiologist, Kings Mill NHS Foundation Trust

Wednesday 28 November - 11:15-11:45

The hand wash station used by Semmelweis consisted of a jug containing calcium hypochlorite and a bowl. The modern hand wash station is in the majority of cases connected to the domestic water supply. Whilst hand washing is seen as the most effective barrier to cross infection there are increasing numbers of reports linking cross infection to the hand wash station. This presentation will look at design of hand wash stations going down to individual components and attendant associated risks. An overview of outbreaks linked to hand wash stations and other sinks will be presented and finally a discussion on where hand wash stations should be located and how design may be improved in the future.

Gram-negative bacteraemias: progress and opportunities for their reduction

Prof Mark Wilcox

Consultant and Head of Microbiology Research and Development, Leeds Teaching Hospitals NHS Trust

Wednesday 28 November - 11:15-11:45

Not yet provided.

Parecho / entero viruses

Dr Heli Harvala

Consultant Medical Virologist, NHS Blood and Transplant Service

Wednesday 28 November - 11:45-12:15

Circulation of non-polio enteroviruses and human parechoviruses in Europe – opportunities and the need for further collaboration

Recently both enteroviruses (EV) and parechoviruses (HPeV) have become an increasing concern as several outbreaks and severe outcomes have been associated with these viruses. The impact of these viruses is exemplified by widespread EV-A71 outbreaks in the Asia-Pacific region and more recently also in Europe, associated with severe neurological outcomes. Further examples include acute flaccid myelitis clusters linked to EV-D68 infections in North America and Europe, and recent large outbreaks of HPeV3 infection in Australia associated with neonatal sepsis-like disease. During the latter outbreak in 2016, HPeV3 infections were linked to severe neurological deficits in newborns.

However, there is no standardised laboratory-based surveillance system for EVs and HPeVs in Europe and no European-wide data on the circulation of EV and HPeV have been previously collected. The data on circulation of EV and HPeV types in 25 European countries between 2015 and 2017 will be presented – these highlight the need and opportunities for further coordinated surveillance and collaborative research. A road map for future surveillance activities by the newly established European Non-Polio Enterovirus Network (ENPEN) will also be presented.

Operating theatre ventilation essentials for the harassed microbiologist

Mr Peter Hoffman

Consultant Clinical Scientist, Public Health England

Wednesday 28 November - 11:45-12:15

Operating theatre ventilation is not normally within the day to day remit of the clinical microbiologist - until something goes wrong. You will then be expected to be an expert. This presentation is intended to act as a primer for those situations. It will cover the theory of operating theatre ventilation and suggested approaches to some of the more predictable difficult situations. The current uncertainties about the value of ultraclean ventilation ("laminar flow") for orthopaedic large prosthetic procedures will also be explored.

Gram-negative bacteraemias: how do we actually do something to reduce them?

Prof Jennie Wilson

Associate Professor in Healthcare Epidemiology, Richard Wells Research Centre, University of West London

Wednesday 28 November - 11:45-12:15

The increase in Gram negative bacteria as a cause of bloodstream infections (BSI) began in England in the mid-2000s and by 2004 *Escherichia coli* (*E.coli*) had replaced *Staphylococcus aureus* as the predominant organisms. By 2018, the incidence of *E coli* BSI was 74.3 per 100, 000 population with 81% associated with onset outside an acute care setting. There are interesting factors associated with their epidemiology that need to be considered in relation to strategies for prevention, these include predominantly occur in people over 75 years of age and with urinary tract infection, peaks in cases in summer months, and marked seasonal variation. This presentation explores potential contributory factors to these infections and implications for effective prevention strategies.

Non-tuberculous mycobacteria and infection control

Dr Sumita Pai

Consultant Microbiologist, The Royal Papworth Hospital NHS Foundation Trust

Wednesday 28 November - 13:45-14:10

There has been a growing concern of emerging Non-tuberculous Mycobacteria in the Cystic Fibrosis population. Recently there have been a few publications investigating the possible cross-transmission of *Mycobacterium abscessus* complex amongst patients with Cystic Fibrosis. My talk will address whether the growing concern warrants improving infection control practices in hospitals to reduce the opportunity for our Cystic Fibrosis patients from acquiring Non-tuberculous Mycobacteria.

Bacteremia surveillance in critical care

Prof Peter Wilson
HIS 2018 Chairman

Wednesday 28 November - 13:45-14:10

Bacteremia in the critically ill patient is associated with morbidity, mortality and high economic costs and is often related to central venous catheters (CVC). Following the Matching Michigan Project, the Infection in Critical Care Quality Improvement Programme (ICCQIP) was formed to collect and publish comparative data on English ICUs. Launched in May 2016, the web based data capture system has had increasing participation every year. Coagulase-negative staphylococci, *Escherichia coli*, *Staphylococcus aureus* and *Enterococcus faecium* are the most commonly reported organisms. The overall case fatality rate is 22.5% and ICU associated CVC bloodstream infection were 2.3, 1.0 and 1.5/1,000 ICU-CVC-days in adult, paediatric and neonatal ICUs, respectively. The wide variation in rates suggests there is considerable progress to be made through audit and feedback nationally.

Decontamination of intra cavity devices

Mr Peter Hoffman

Consultant Clinical Scientist, Public Health England

Wednesday 28 November - 13:45-14:25

As happened with endoscopes a few decades back, the world is starting to realise that there are useful, expensive, delicate and intricate medical devices where their decontamination is often an afterthought. These are intracavity medical devices using ultrasound for examination and to guide invasive procedures. These are often used in locations with poor facilities for cleaning and disinfecting, and in circumstances where a rapid turnaround is necessary. The use of barriers such as sheathes does not adequately diminish their potential for infection transmission. This talk coincides with publication of an HIS working group's guidance on decontamination of intracavity medical devices. It will outline the problem, approaches to the present situation and help with planning for better medium and long term solutions.

What qualitative research can tell us about infection prevention and control

Dr Emma Burnett

Senior Lecturer, University of Dundee

Wednesday 28 November - 13:45-15:00

Principles of infection prevention and control practice are notoriously difficult for healthcare staff to apply consistently to their practice. As the literature attests, there is an enduring history of sub-optimal adherence to recommended practices, including hand hygiene and other standard precautions. Qualitative methods of research can be used to investigate the factors that influence the implementation of infection prevention behaviours in healthcare practice. They can also be used to explore patients' experiences relating to healthcare-associated infection. When qualitative approaches are incorporated into the evaluation of interventions designed to improve practice and reduce infections, evidence can be generated about the contextual factors and mechanisms that contribute to success or failure. This adds to our understanding of the common characteristics of effective interventions and their acceptability to patients. In this session, we will present examples of published qualitative research on infection prevention and control to illustrate the nature of the evidence generated and how this can be used to inform the design of interventions to improve practice.

What qualitative research can tell us about infection prevention and control

Dr Jacqui Prieto

Associate Professor and Clinical Nurse Specialist, University of Southampton and University Hospital Southampton NHS Foundation Trust

Wednesday 28 November - 13:45-15:00

Principles of infection prevention and control practice are notoriously difficult for healthcare staff to apply consistently to their practice. As the literature attests, there is an enduring history of sub-optimal adherence to recommended practices, including hand hygiene and other standard precautions. Qualitative methods of research can be used to investigate the factors that influence the implementation of infection prevention behaviours in healthcare practice. They can also be used to explore patients' experiences relating to healthcare-associated infection. When qualitative approaches are incorporated into the evaluation of interventions designed to improve practice and reduce infections, evidence can be generated about the contextual factors and mechanisms that contribute to success or failure. This adds to our understanding of the common characteristics of effective interventions and their acceptability to patients. In this session, we will present examples of published qualitative research on infection prevention and control to illustrate the nature of the evidence generated and how this can be used to inform the design of interventions to improve practice.

Endoscope reprocessing - The need to shift from HLD to sterilisation

Prof William Rutala

Research Professor of Medicine, UNC School of Medicine

Wednesday 28 November - 14:10-14:30

Millions of gastrointestinal endoscopes are performed each year. Gastrointestinal endoscopes become highly contaminated during use (i.e., internal channels contain 7-10-log₁₀ enteric microorganisms). Currently, endoscopes (e.g., bronchoscopes, GI endoscopes) are classified as semi-critical items because they contact intact mucous membranes and most commonly undergo cleaning and high-level disinfection which results in as little as a 6-log₁₀ reduction of microorganisms. Therefore and not surprisingly, in recent years there have been multiple reports that have documented that endoscopes, especially duodenoscopes, frequently remain contaminated with bacterial pathogens after proper cleaning/disinfection. These outbreaks of multidrug-resistant pathogens from contaminated endoscopes have resulted in substantial death and morbidity. Since these endoscopes commonly contact non-intact mucous membranes and sterile tissue, which are considered critical items, we propose that to ensure patient safety, we move from high-level disinfection to sterilization of endoscopes or use an alternative diagnostic/therapeutic method to assure patient safety (e.g., non-endoscopic diagnostic test, disposable sterile endoscopes).

Non-tuberculous mycobacteria in adult cystic fibrosis

Dr Nadia Shafi

Consultant Respiratory Physician and Adult CF specialist, Bart's Health NHS Trust

Wednesday 28 November - 14:10-14:30

An overview of NTM infection in the context of adult Cystic Fibrosis, with particular focus on *Mycobacterium abscessus* infection, treatment and outcomes.

Faecal microbiota transplant guideline

Dr Simon Goldenberg

Consultant Microbiologist and Infection Control Doctor, Guy's and St Thomas' NHS Foundation Trust

Wednesday 28 November - 14:25-15:00

Not yet provided.

Non-tuberculous mycobacteria in paediatric cystic fibrosis

Dr Garth Dixon

Consultant and Clinical Lead in Microbiology, Great Ormond Street Hospital for Children NHS Trust

Wednesday 28 November - 14:30-15:00

Infections with non-tuberculous Mycobacteria are an increasing problem in children and young adults with Cystic Fibrosis (CF). Of these, infections with *Mycobacterium abscessus* complex (*M. abscessus* subsp. *abscessus*, *M. bmassiliense* and *M. bolletii*) are by far the most challenging. Extreme resistance to antimicrobial agents, plus low tolerability and toxicity of the multiple agents needed to treat infections with organism is problematic, and infections post heart lung transplantation can be particularly severe, requiring prolonged and often toxic antimicrobial therapy, and can be fatal.

Reducing catheter associated urinary tract infections - The effectiveness and cost-effectiveness of chlorhexidine versus saline for meatal cleaning prior to urinary catheter insertion

Prof Brett Mitchell

Professor of Nursing, Avondale College of Higher Education

Wednesday 28 November - 14:30-15:00

Not yet provided.

The three top papers that have influenced infection prevention practice: USA vs. Europe vs. Rest of the World. The audience decide.

Dr Tim Boswell

Consultant Medical Microbiologist, Nottingham University Hospitals

Wednesday 28 November - 15:30-16:30

N/A

The three top papers that have influenced infection prevention practice: USA vs. Europe vs. Rest of the World. The audience decide.

Prof Brett Mitchell

Professor of Nursing, Avondale College of Higher Education

Wednesday 28 November - 15:30-16:30

N/A

The three top papers that have influenced infection prevention practice: USA vs. Europe vs. Rest of the World. The audience decide.

Prof William Rutala

Research Professor of Medicine, UNC School of Medicine

Wednesday 28 November - 15:30-16:30

N/A