IDSI Infectious Diseases Society of Ireland

UCC University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Contemporary Issues in Infectious Diseases

7th Annual Scientific Meeting of the Infectious Diseases Society of Ireland (IDSI)

Thursday 24th to Saturday 26th April 2014
Brookfield Health Sciences Complex, University College Cork

PROGRAMME & BOOK of ABSTRACTS

Welcome

On behalf of Dr. Arthur Jackson, the Organising Committee and the Society, I am delighted to welcome you to the 7th annual meeting of the Infectious Diseases Society of Ireland (IDSI). Welcome back to Cork and to UCC College of Medicine and Health!

The Annual Meeting will be held over 3 days in the lovely surroundings of University College Cork Health Science Centre in Brookfield. This year's program has been developed to appeal to a wide audience with topics relevant to primary care, Internal Medicine and Public Health. A half day session, dedicated to issues pertinent to Infectious Diseases in Primary care and Internal Medicine, will take place on the final day of the conference. This session has been developed in conjunction with Primary Care and Internal Medicine to address common issues in Infectious Diseases.

The area of Infectious Diseases continues to be an evolving area. The threat of new infections, complications of drug therapies-antibiotics and biologic agents, vaccine and probiotic development and progress in the fight against HIV/AIDS will feature in the program. The progress made in treatment of Hepatitis C infection will be presented. These sessions will be addressed and debated by internationally recognised experts in the areas who will provide state of the art lectures in their fields. The conference provides an opportunity to showcase the research done in the field in Ireland.

The society is proud of its links between other disciplines in the area of Infectious Diseases including Clinical Microbiology and Virology, Genitourinary Medicine, Public Health Medicine and disease surveillance, Hepatology, Internal Medicine and Primary care. We are delighted to welcome attendees from all these disciplines.

We are grateful to UCC for the support provided for the meeting and to our corporate sponsors in pharma who contribute to the important area of continuous professional development.

We hope that you will take the opportunity to learn, network and actively participate in the meeting.

Best wishes

Mary Horgan
President, IDSI
Dean, School of Medicine, UCC

Organising Committee

Professor Mary Horgan, Cork University Hospital/University College Cork

Dr. Arthur Jackson, Mercy University Hospital/Cork University Hospital

Professor Colm Bergin, St. James's Hospital, Dublin

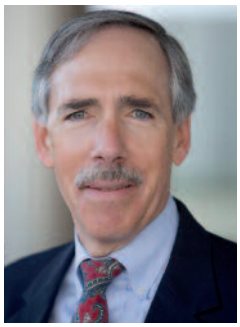
Dr. Susie Clarke, St. James's Hospital, Dublin

Dr. Catherine Fleming, Galway University Hospital

Dr. Patrick Mallon, Mater Misericordiae University Hospital, Dublin

Biographies of International Plenary Speakers

Frederick G. Hayden, MD, FACP

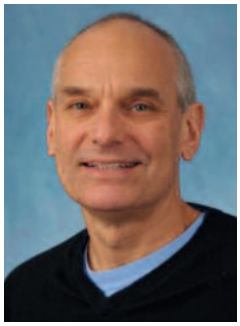


Dr Hayden is Stuart S. Richardson Professor of Clinical Virology and Professor of Medicine at the University of Virginia School of Medicine in Charlottesville, Virginia, USA. During 2006-2008 he served as a medical officer in the Global Influenza Programme at the World Health Organization, Geneva and during 2008-2012 as influenza research coordinator within International Activities at the Wellcome Trust, London.

Dr Hayden received his medical degree from Stanford University School of Medicine in 1973 and completed his clinical training in internal medicine and infectious diseases at Strong Memorial Hospital, University of Rochester, New York. He joined the faculty of the University of Virginia in 1978 and became Richardson Professor in 1990. His principle research interests have been on respiratory viral infections with a particular focus on the development and application of antiviral agents for influenza and rhinovirus infections. He has published over 350 peer-reviewed articles, chapters, and reviews, and co-edited the textbook Clinical Virology, the third edition of which was published in 2009 by the American Society for Microbiology.

Dr Hayden chaired the writing committees for two WHO clinical consultations on avian H5N1 and one on pandemic 2009 H1N1 influenza and continues to serve as a consultant to WHO on respiratory viral infections including avian H7N9 and MERS-CoV. In 2012-13 he worked with WHO colleagues to develop a new initiative, the Battle against Respiratory Viruses, to foster research on this important public health problem. During his work at the Wellcome Trust he also helped to establish a new federation of clinical research networks called the International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC) to improve the clinical research response to respiratory and other emerging infectious disease threats. Since October 2013 he has been serving as the interim chair of ISARIC. He is a member of multiple editorial boards and served as section editor of Antiviral Therapy for respiratory viruses for 18 years through 2013. He is a member of the board of the International Society of Influenza and Other Respiratory Viruses and a Fellow of the Infectious Diseases Society of America, American Academy of Microbiology, American Society for Clinical Investigation, and Association of American Physicians.

Charles van der Horst, MD, FACP, FIDSA



Dr. van der Horst is a professor of medicine and infectious diseases at the University of North Carolina-Chapel Hill. His research focuses on clinical trials of the treatment and prevention of HIV and associated infections as well as other infectious diseases. He has been taking care of HIV patients since the beginning of the epidemic in the United States in 1980 and helped establish and expand HIV treatment centers around the state of North Carolina. In 2001 he began working in South Africa and Malawi with a primary focus on prevention of mother to child transmission and training of researchers. He directs the UNC Center for AIDS Research Developmental Core, the Fogarty Global Health Fellows Program, and the infectious diseases fellowship training program. He maintains a clinic of patients in Chapel Hill. Outside of his work, he has been a political activist for many years, helping stop executions in North Carolina in 2006 and being arrested May 6, 2013 at the NC legislature over the refusal of the state to expand Medicaid.

Josbert J. Keller, MD, PhD

Josbert Keller completed medical school at the University of Amsterdam. Subsequently, he was a PhD fellow at the Department of Pathology at the AMC (Academic Medical Center of the University of Amsterdam) in collaboration with the Department of Gastroenterology at the Johns Hopkins University Hospital in Baltimore, investigating molecular alterations in polyposis syndromes. During his GI fellowship at the AMC, he initiated the FECAL trial, comparing the efficacy of donor feces infusion with conventional antibiotic therapy for patients with recurrent *Clostridium difficile* infection, of which the results were published in 2013. Since 2009, he works at the Haga Teaching Hospital (Hagaziekenhuis) in The Hague, the Netherlands. He is the secretary of the Netherlands Society of Gastroenterology (NVGE).

Bill Powderly, M.D.

Bill Powderly is the J. William Campbell Professor of Medicine and Director of the Institute of Public Health at Washington University. He is also Co-Director of the Division of Infectious Diseases at the School of Medicine. From 2005 to 2012, he was Dean of Medicine and Head of the School of Medicine and Medical Sciences at University College Dublin in Ireland.

Dr. Powderly has been actively involved in HIV-related clinical research for over twenty-five years. He has been a member of numerous advisory groups on HIV and infectious diseases for the National Institutes of Health (NIH), the U.S. Centers for Disease Control and Prevention, the Canadian Institute for Health Research, and the European Medicines Agency. He is the author of more than 350 scientific journal articles and book chapters on HIV and AIDS.

Paul Spearman, MD

Dr. Paul Spearman is Professor of Pediatrics and Microbiology, Division Chief of Pediatric Infectious Diseases, Vice Chair for Research in the Department of Pediatrics at Emory University, and Chief Research Officer for Children's Healthcare of Atlanta. Dr. Spearman received his M.D. degree from the University of Texas Southwestern, and trained in Internal Medicine and Pediatrics at Ohio State University. He then pursued Infectious Diseases Fellowship Training at Washington University in St. Louis. Dr. Spearman spent eleven years on the faculty of the Pediatric Infectious Diseases Division at Vanderbilt University before assuming the Director's role at Emory. He directs an NIH-funded basic research laboratory studying the assembly process of HIV, the role of tetherin and the HIV accessory protein Vpu, and the design and evaluation of novel HIV vaccines. Dr. Spearman also leads a large clinical trials enterprise studying new vaccines for children and evaluating new antibiotics for safety and effectiveness in children. In addition to his local leadership roles, Dr. Spearman has served on a number of NIH study sections and chaired the AIDS Molecular and Cellular Biology Study Section from 2009-2011. He is a Fellow of the Infectious Diseases Society of America (IDSA) and Chair of the Research Affairs Committee for the Pediatric Infectious Diseases Society (PIDS).

Biographies of Local Plenary Speakers

Professor Colm J Bergin MD, FRCPI, FRCP(Ed)

Professor Colm Bergin is a Consultant Physician in Infectious Diseases, St James's Hospital, Dublin and Clinical Professor of Medicine at Trinity College Dublin. He is the Associate Director of the Wellcome-Health Research Board (HRB) Clinical Research Facility, St. James's Hospital Dublin, (RCPI) and the Dean of Postgraduate Medical Training and Dun's Tutor, RCPI.
Prior appointments have included Clinical Director of the Surgical and Medical Subspecialties Directorate at St. James's Hospital, Dublin (2006-2012), NSD for Infectious Diseases, RCPI (2002-2009); co-NSD, Infectious Diseases, RCPI (2009-2013), President of the Infectious Diseases Society of Ireland (IDSI) (2009-2012) and National Programme Lead for OPAT, Health Services Executive, Ireland (2010-2012).

Professor Bergin graduated from Trinity College Dublin in 1989 and completed General Medicine and Specialist Training in GU Medicine. Subsequently, Professor Bergin completed a Fellowship in Infectious Diseases at Boston University Hospital (1996-1999) and returned to Dublin in 1999 when he was appointed to his present consultant position in St. James's Hospital.

Professor Bergin is the co-director of the Department of GU Medicine and Infectious Diseases Clinical Studies Unit, the department has an active national and international research reputation. The department provides care for approximately 2200 HIV+ patients with ~500 HIV-HCV co-infected patients. The department cares for ~ 60% of all HIV+ patients in the Irish Republic and ~90% of all pregnancies in HIV positive women. Professor Bergin has secured funding from national and international funds including FP-7 funding in 2012. He is the supervisor for a number of MD and PhD degrees covering research topics in medical education, cost effectiveness of medical care (HIV and HCV) molecular and clinical epidemiology, immunology of host response to infections (TB and HCV), neurocognitive disease in HIV infection and innovative interventions to affect social behaviours in disease modelling.

Colin Hill

Colin Hill has a Ph.D in molecular microbiology and is Professor of Microbial Food Safety in the Microbiology Department of University College Cork, Ireland. His main interests are in infectious disease, particularly in defining the mechanisms of virulence of foodborne pathogens and in developing strategies to prevent and limit the consequences of microbial infections in the gastrointestinal tract. He is also a Principal Investigator in the Alimentary Pharmabiotic Centre in Cork, a large research centre devoted to the study of the role of the gut microbiota in health and disease. In 2005 Prof. Hill was awarded a D.Sc by the National University of Ireland in recognition of his contributions to research. In 2009 he was elected to the Royal Irish Academy and in 2010 he received the Metchnikoff Prize in Microbiology and was elected to the American Academy of Microbiology. He has published more than 375 papers and holds 14 patents. He is president of ISAPP since 2012.

IDSI Annual Scientific Meeting

24th-26th April 2014

Contemporary Issues in Infectious Diseases

Thursday, 24th April 2014

Registration: 15.00

15.30-16.00 Tea/Coffee

16.00-17.00 Sponsored Symposium : **Advancements in Virology**

Speakers: Dr. Shay Keating, St. James's Hospital, Dublin:
Management of Hepatitis C in HIV/HCV co-infected patients;
Professor Colm Bergin, St. James's Hospital, Dublin: ***Powerful Performance in HIV***

17.00-17.15 Tea/Coffee, Poster Viewing & Exhibition

Clinical Session

Co-Chairs: Professor Mary Horgan, CUH, Dr. Arthur Jackson

17.15-17.55 ***Climate Change and Infectious Diseases: an Impending Storm?***
Professor William Powderly, J. William Campbell Professor of Medicine,
Washington University in St. Louis

17.55-18.35 ***Mining our Microbiota for Novel Probiotics,***
Pharmabiotics and Phage for combatting Clostridium difficile
Professor Colin Hill, Professor of Microbial Food Safety, UCC

18.35-20.00 SpR Clinical Presentations x 5 (3 more to come)

The Kneed for a Cure, Dr. Deirdre Morley, Cork University Hospital

"Ovid's Metamorphoses", Dr. Ruth O'Riordan, Galway University Hospital

Friday, 25th April 2014

07.00 **Registration**

07.30 Breakfast

07.45-08.45 Sponsored Symposium: Dr. Claire Cushen
(Title to come here)

08.45-09.00 **Welcome Address** -
Professor Mary Horgan, Consultant in Infectious Diseases, Cork University Hospital

09.00-09.40 Early morning Session
Emerging Respiratory Viral Threats – Professor Frederick Hayden, Professor of Clinical Virology, Medicine and Pathology , University of Virginia, Charlottesville

09.40-10.55 Clinical Abstract Oral Presentations

09.40-09.55 **Dissemination of clonally related ESBL-producing *Klebsiella pneumoniae* in Ireland**
D Morris, M O'Connor, R Izdebski, M Corcoran, C Ludden, E McGrath, V Buckley, B Cryan, M Gniadkowski, M Cormican National University of Ireland, Galway

09.55-10.10 **Use of a new 4 Component Meningococcal Serogroup B Vaccine (4CMenB), to Control an Outbreak of Invasive Meningococcal Disease (IMD)**
L.O'Connor[1] S. Cotter[2], M. Ward[1], P. O Lorcain[2], R. Mulhall[3], R. Cunney[3], R. McDermott[1], J.Heslin[4], Elaine Neville[4], Mary Conlon[1], R. Fitzgerald[5], A. Clarke[1], D. Bennett[3], B. O'Connor[4], B. Corcoran[6], H. Murray[6], D. O'Flanagan[2]
1. Dept. Public Health, HSE East, Dr Steevens Hospital, Dublin; 2. Health Protection Surveillance Centre, Dublin; 3. Irish Meningococcal and Meningitis Reference Laboratory, Temple Street Children's Hospital, Dublin; 4. Dept. of Public Health, HSE South-East, Kilkenny; 5. Dept of Public Health, HSE Mid-West, Limerick; 6. National Immunisation Office, Dublin

10.10-10.25 **Carbapenemase-Producing Enterobacteriaceae in Ireland 2013: Clonal dissemination of OXA-48 producing *Klebsiella pneumonia***
McGrath E[1], Murphy AM[1], King J[1], Tansey S[1], Boo TW[1,2], Cormican M[1,2].
1. Department of Medical Microbiology, Galway University Hospital, Galway;
2. School of Medicine, NUI Galway

10.25-10.40 **Detection of Verotoxigenic *Escherichia coli* (VTEC) Contamination in Groundwater**
S Kavanagh[1], M Cormican[1,3], K Carney[2], B MacDomhnaill[2], D Morris[1]
1 Department of Bacteriology, National University of Ireland, Galway, Ireland; 2 National Federation of Group Water Schemes, Monaghan, Ireland; 3 Centre for Health from Environment, Ryan Institute for Environmental, Marine and Energy Research, National University of Ireland, Galway

10.40-10.55 **Characterisation of Meticillin-Resistant *Staphylococcus aureus* Strains Isolated from Residents and the Environment of a Nursing Home**
C Ludden, G Brennan, D Morris, B Austin, B O'Connell, M Cormican
Clinical Science Institute, National University of Ireland Galway

11.00-11.30 Coffee/tea, Poster Viewing & Exhibition

Late morning Session

11.30-12.10 ***Treatment strategies for recurrent Clostridium difficile infection***
Dr. Josbert Keller, Hagaziekenhuis Hospital, The Hague.

12.10-2.55 Clinical Abstract Oral Presentations

12.10-12.25 **Clinical, immunological and treatment-related predictors of normalisation of CD4:CD8 ratio; effect of naïve and memory T-cell subsets**
W Tinago[1,3], E Coghlan[1], A Macken[1], B Doaks[2], J McAndrew[2], C F Prior, J Lambert [1,2], G Sheehan [1,2], P W G Mallon[1,2]
1 HIV Molecular Research Group. School of Medicine and Medical Science, University College Dublin, Dublin, Ireland; 2Department of Infectious Diseases, Mater Misericordiae University Hospital, Dublin, Ireland; 3Department of Community Medicine, University of Zimbabwe, Harare, Zimbabwe

12.25-12.40 **Reduced high density lipoprotein cholesterol (HDLc) rather than elevated low density lipoprotein (LDLc) is the principal dyslipidaemia in HIV-positive subjects on contemporary antiretroviral therapy (ART)**
Aoife G. Cotter, Caroline A. Sabin, Sibongile Simelane, Alan Macken, Brendan Rogers, Eoin Kavanagh, Jennifer J. Brady, Patrick W.G. Mallon on behalf of the 'Understanding the Pathology of Bone Disease in HIV Infected Subjects' (HIV UPBEAT) Study Group.

12.40-12.55 **Reliability and Validity of the HIV Disability Questionnaire (HDQ) with Adults Living with HIV in Canada and Ireland**
KK O'Brien[1], C Bergin[2], S O'Dea[2], P Solomon[3], P Stratford[3], N Iku[1], A M Bayoumi[4]
1. University of Toronto, Dept. of Physical Therapy; 2. St. James's Hospital, Dublin; 3. McMaster University, School of Rehabilitation Science, Ontario; 4. St. Michael's Hospital, Toronto

12. 55 – 13.15 Lunch

13.15-14.00 Sponsored Symposium:

Advances in HIV Testing and Linkage to Care
Chair: Dr. Paddy Mallon, Consultant in Infectious Diseases, Mater University Hospital, Dublin. Keynote Speaker: Dr. Ethan Cowan, Assistant Professor, Department of Emergency Medicine, Jacobi Medical Centre, Bronx, New York.

Early Afternoon Session

14.05-14.45 ***HIV Infection of Macrophages: Basic Research Findings and Clinical Significance***
Professor Paul Spearman, Professor of Pediatrics and Microbiology, Emory University, Atlanta

14.45-15.45 Scientific Abstracts: Oral Presentations

14.45-15.00 **Immunological Efficacy of a Prime-Boost Vaccine Strategy Combining the 13-Valent Pneumococcal Conjugate Vaccine (PCV13) Followed by the 23-Valent Pneumococcal Polysaccharide Vaccine (PPV23) Versus PPV 23 Alone in HIV-Infected Adults**
C Sadlier, N Conlon, C Rock, A Brown, S O'Dea, J Dunne, C Bergin St. James's Hospital, Dublin

15.00-15.15 **Detection of recombination events in Hepatitis C virus**
B Palmer, Z Dimitrova, P Skums, O Crosbie, E Kenny-Walsh, L J Fanning Cork University Hospital

15.15-15.30 **Effect of Switch from Abacavir to Tenofovir DF on Platelet Function Markers: a SWIFT Trial Sub-study**
JA O'Halloran HIV Molecular Research Group, University College Dublin

15.30-15.45 ***Campylobacter ureolyticus:* an exercise in serendipity**
D Corcoran, S Bullman, M Koziel, A Lucid, B Lucey, RD Sleator Cork University Hospital

15.45-16.00 Tea/Coffee, Poster viewing and Exhibition

Late afternoon Session

16.00-16.45 Scientific Abstracts: Oral Presentations

16.00-16.15 **Safety and Efficacy of the Single Tablet Regimen Rilpivirine-Tenofovir-Emtricitabine (Eviplera®) in Clinical Practice**
S O'Connell, S O'Dea, S Kelly, C Bergin GUIDE Department, St James Hospital, Dublin 8

16.15-16.30 **Have we been doing what we should be doing? A splenectomy audit: Jan 2012 - December 2013**
Laura Cooke, Dr. Karen Burns Beaumont Hospital, Dublin

16.30-17.10 ***Preventing Mother to Child Transmission of HIV: from Clinical Trials to Implementation in Malawi***
Professor Charles van der Horst, Professor of Medicine, University of North Carolina, Chapel Hill

17.15 **Prizegiving**

17.30 **Reception in Jennings Gallery, 1st floor, Brookfield Health Sciences Complex**

18.00 **IDSI AGM**

ORAL PRESENTATIONS

OP1

Dissemination of clonally related ESBL-producing *Klebsiella pneumoniae* in Ireland

D Morris, M O'Connor, R Izdebski, M Corcoran, C Ludden, E McGrath, V Buckley, B Cryan, M Gniadkowski, M Cormican National University of Ireland, Galway

Background: In October 2012, an outbreak of gentamicin resistant, ciprofloxacin non-susceptible ESBL producing *Klebsiella pneumoniae* (CipGeESBL-Kp) occurred in a neonatal intensive care unit. The aim of this study was to determine if the associated strain was more widely dispersed.

Methods: One hundred and thirty seven isolates collected from seventeen hospitals throughout Ireland between January 2011 and July 2013 were examined. ESBL production was confirmed by the combination disk method using cefpodoxime. All isolates were screened for susceptibility to nineteen antimicrobial agents and for the presence of bla_{TEM}, bla_{SHV}, bla_{OXA}, and bla_{CTX-M}. Twenty-two isolates were screened for the presence of bla_{KPC}, bla_{VIM}, bla_{IMP} and bla_{OXA-48}. Pulsed-field gel electrophoresis (PFGE) was performed on all isolates and multi locus sequence typing (MLST) was performed on 36 isolates.

Results: All isolates harboured bla_{SHV} and bla_{CTX-M} and were resistant to ciprofloxacin, gentamicin, nalidixic acid, ampicillin, amoxicillin-clavulanate, cefpodoxime. Fifteen isolates were resistant to ertapenem, seven were resistant to meropenem and five were confirmed as carbapenemase producers (bla_{KPC-2} (n = 4) one isolate harboured bla_{NDM} and bla_{OXA-48}. PFGE analysis identified sixteen major clusters, with two clusters comprising 64% of the entire collection. MLST analysis identified a novel MLST type, ST1236, a single locus variant of ST48. Data suggests that two major clonal groups, ST1236/ST48 (CG43) and ST15/ST14 (CG15) have been circulating in Ireland since at least January 2011.

Conclusion: Active surveillance to enhance knowledge of the distribution of these and other clonal groups is required to develop and implement appropriate infection control and prevention procedures.

OP2

Use of a new 4 Component Meningococcal Serogroup B Vaccine (4CMenB), to Control an Outbreak of Invasive Meningococcal Disease (IMD)

L.O'Connor[1] S. Cotter[2], M. Ward[1], P. O Lorcain[2], R. Mulhall[3], R. Cunney[3], R. McDermott[1], J.Heslin[4], Elaine Neville[4], Mary Conlon[1], R. Fitzgerald[5], A. Clarke[1], D. Bennett[3], B. O'Connor[4], B. Corcoran[6], H. Murray[6], D. O'Flanagan[2]
1. Dept. Public Health, HSE East, Dr Steevens Hospital, Dublin; 2. Health Protection Surveillance Centre, Dublin; 3. Irish Meningococcal and Meningitis Reference Laboratory, Temple Street Children's Hospital, Dublin; 4. Dept. of Public Health, HSE South-East, Kilkenny; 5. Dept of Public Health, HSE Mid-West, Limerick; 6. National Immunisation Office, Dublin

Background: In January 2013, the European Medicines Agency approved a 4CMenB vaccine for prevention of meningococcal serogroup B disease. It was predicted that vaccine coverage for Ireland would be 68%. We report on using 4CMenB vaccine to control a cluster of IMD in an extended Traveller family.

Between March 2010-November 2013 eight laboratory confirmed IMD serogroup B cases were identified in an extended Traveller family. Cases were aged 5-46 months, all were hospitalised and three required intensive care admissions. Seven cases recovered completely and one child remains under hospital care. Chemoprophylaxis given to nuclear family members and contacts failed to prevent further cases.

Methodology: An outbreak control team was convened and actions agreed included: (1) Directly observed chemoprophylaxis with ciprofloxacin be administered extended family network. (2) The 4CMenB vaccine to be administered to family members aged 2 months to 23 years inclusive. (3) All children <2 years to receive anti-pyretic medication at the clinic. (4) Pharyngeal swabs to be taken on all extended family to assess carriage rates of *N. meningitidis*.

Results: In December 2013, 113 family members attended clinics where chemoprophylaxis was provided and pharyngeal swabs were taken. 4CMen B vaccine was administered to 29 family members. Six (21%) clinic attendees reported sore arms as the only adverse reaction. A further 47 family members received the

vaccine in January 2014. Pharyngeal carriage of *N. meningitidis* was reported in 13% samples. Meningococcal isolates from six cases were the same multi-locus sequence typing (MLST) type (ST 41/44) and porA type (7-2,4).

Conclusion: As the carriage of *N. meningitidis* was similar to that of the general population we suggest that poor social and housing circumstances increased the vulnerability of this group to meningococcal infection. We recommend that more extensive use of this vaccine for similar vulnerable groups needs to be considered/

OP3

Carbapenemase-Producing Enterobacteriaceae in Ireland 2013: Clonal dissemination of OXA-48 producing *Klebsiella pneumoniae*

McGrath E[1], Murphy AM[1], King J[1], Tansey S[1], Boo TW[1,2], Cormican M[1,2].
1. Department of Medical Microbiology, Galway University Hospital, Galway; 2. School of Medicine, NUI Galway

Background: The emergence of Carbapenemase-producing Enterobacteriaceae (CPE) is an increasing public health threat. In response to this a National Reference Laboratory service for CPE was established in Ireland in late 2012 to provide characterisation of isolates and to support surveillance of epidemiological trends. We describe the establishment of the service and the results for the first 14 months (October 2012 to November 2013) of operation.

Methods: Clinical laboratories were invited to submit all Enterobacteriaceae from any site with a meropenem MIC of ≥0.25mg/L and other meropenem-resistant Gram-negative bacteria where there was a particular clinical concern. Enterobacteriaceae were assessed by the ROSCO confirm kit to establish the phenotypic pattern or resistance followed by in-house RT-PCR for 11 carbapenemase targets (Class A: KPC, IMI, GES; Class B: VIM, IMP, NDM and Class D: OXA-48, OXA-23, OXA-51, OXA-58, OXA-24/40). Molecular typing by PFGE was performed on carbapenemase producing isolates.
Results: A total of 212 Enterobacteriaceae and 25 other Gram-negative bacteria were received. Carbapenemase production was detected in 52 Enterobacteriaceae strains and 1 *Acinetobacter baumannii*. Carbapenemase producers were received from 17 hospitals with a range of 1 to 11 isolates per hospital. OXA-48-like carbapenemase producers accounted for 55.7% of isolates, KPC for 26.9% and NDM for 9.6%. There were 2 IMP producers (3.8%) and a single IMI producer (1.9%). OXA-23 was detected in one *Acinetobacter baumannii* isolate. There was a trend over the period towards less KPC producers and more OXA48 producers. Amongst the OXA-48 producers, *Klebsiella pneumoniae* accounted for the majority of isolates (75.85%), while *Escherichia coli* constituted 20.7% of isolates. PFGE indicated that OXA-48 producing *K. pneumoniae* from 6 institutions in different regions in the most recent six months (May to November 2013) were very closely related.

Conclusion: OXA-48-producing *K. pneumoniae* predominate amongst carbapenemase producing Enterobacteriaceae in Ireland. Molecular typing and limited epidemiological data are consistent with dissemination of an OXA-48-producing *K. pneumoniae* within and between hospitals.

OP4

Detection of Verotoxigenic *Escherichia coli* (VTEC) Contamination in Groundwater

S Kavanagh[1], M Cormican[1,3], K Carney[2], B MacDomhnaill[2], D Morris[1]
[1]Department of Bacteriology, National University of Ireland, Galway, Ireland; [2] National Federation of Group Water Schemes, Monaghan, Ireland; [3] Centre for Health from Environment, Ryan Institute for Environmental, Marine and Energy Research, National University of Ireland, Galway

Background: Verotoxigenic *Escherichia coli* (VTEC) present a major threat to public health in Ireland. Approximately 18% of the population receives water from private wells or rural group water supplies that may be particularly vulnerable to VTEC contamination.

Methods: Raw and treated waters from six group water supplies (GWS) were examined for VTEC in this study, by novel and standard methods. A novel filtration method for screening large volumes of water for VTEC, involving capture and enrichment, was developed by the ARME Group, NUI Galway. Enrichments are screened using real-time PCR for virulence genes (*eae*, VTX 1 and VTX 2) and antigenic determinants for *E. coli* O157 and O26.

Strain isolation, with and without immunomagnetic separation (IMS) is also carried out, on CHROMagar™ STEC. Raw and treated waters were tested from six GWS on three occasions between August and October 2013. A separate 1L sample was collected in parallel for examination by standard immunomagnetic separation methods (ISO 16654:2001). All suspect VTEC colonies were screened using real-time PCR.

Results: VTEC was detected in raw water from 5 out of 6 GWS on each sampling occasion by the novel method. The *E. coli* O157 target was detected in every scheme and the *E. coli* O26 target was detected in 5 out of 6 schemes. VTX 1/2 positive *E. coli* O157 and *E. coli* O26 were isolated from 4 schemes testing positive for VTEC by real-time PCR. The standard protocol detected VTEC from one scheme on two occasions. VTEC was not detected by either method in treated water.

Conclusion: VTEC was commonly detected in groundwater in the region under investigation. In the GWS the treatment systems effectively eliminated VTEC from the water. The novel method detected VTEC in a higher number of samples than immunomagnetic separation methods alone.

OP5

Characterisation of Meticillin-Resistant *Staphylococcus aureus* Strains Isolated from Residents and the Environment of a Nursing Home

C Ludden, G Brennan, D Morris, B Austin, B O'Connell, M Cormican Clinical Science Institute, National University of Ireland Galway

Background: Meticillin-resistant *Staphylococcus* (MRSA) is a major public health concern with residence in nursing home a known risk factor for acquisition. The environment may play an important role in the dissemination of MRSA. The aim of this study was to characterise MRSA recovered from residents and their physical environment.

Methods: Sixty-four residents of one nursing home were screened for nasal colonization with MRSA at baseline and at three-monthly intervals from July 2012-August 2013. In August 2013 and from August-October 2011 environmental sampling was performed. All isolates were confirmed as meticillin resistant and *spa* typing was performed on 32 isolates; 17 from residents and 15 from the environment. Ridom StaphType, version1.5, was used to assign *spa* types from the repeat succession. The sequence type (ST) was inferred using data held in the Ridom SpaServer (http://www.spaserver.ridom.de/). Based upon Repeating Patterns (BURP) analysis was used to define the *spa* clonal complexes (*spa*–CC).

Results: MRSA was recovered from 28% (17/64) of residents (R) on at least one occasion and from 34% (92/270) of environmental (E) samples. The *spa* types were as follows **15** t032 (8 R, 7 E), **4** t727 (E), **3** t022 (R), **2** t002 (R), **2** t8783 (E), and **1** each of t1372 (E), t020 (E), t611 (R), t4623 (R), t379 (R), t045 (R). Twenty four isolates (*spa* types t032, t022, t020, t379, t611, t4623, t8783) clustered together in a single clonal complex (*spa*-CC22) where all *spa* types are associated with ST22. *spa* types t727 and t1372 were excluded from clustering, as they consisted of only four and two repeat units, respectively. *spa* type t727 (predicted ST45) represented 4/14 environmental isolates.

Conclusion: The t032 *spa* type (47%) and *spa*-CC 22 (75%) predominated. This reflects the most common types recovered in Irish hospitals where ST22 predominates. *spa* type t727 was present in the environment but not detected in residents and is infrequently observed in Ireland.

OP6

Clinical, immunological and treatment-related predictors of normalisation of CD4:CD8 ratio; effect of naïve and memory T-cell subsets.

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Background: Although effective antiretroviral therapy(ART) increases CD4+ T-cell count, responses to ART vary considerably and only a minority of patients normalise their CD4+/CD8+ ratio. Although retention of naïve CD4+ T-cells is thought to predict better immune

responses, relationships between CD4+ and CD8+ T-cell subsets and CD4+/CD8+ ratio have not been well described.

Methods: A cross-sectional study in a cohort of ambulatory HIV**+** patients. We used flow cytometry on fresh blood to determine expanded CD4+ and CD8+ T-cell subsets; CD45RO+CD62L+(central memory), CD45RO+CD62L-(effector memory) and CD45RO-CD62L+(naïve) alongside routine T-cell subsets, HIVRNA and collected demographic and treatment data. The relationship between CD4+/CD8+ ratio and expanded T-cell subsets was determined using linear regression analysis. Results are median[IQR] and regression coefficients unless stated.

Results: We recruited 190 subjects, age 42(36-48) years, 65% male, 65.3% Caucasian, 91% on ART(52.6% on protease inhibitors), 78.4% with HIVRNA<40cps/ml and median ART duration 6.8(2.6-10.2) years. Nadir and current CD4+ counts were 200(112-309) and 465(335-607) cells/mm^3 respectively. Median CD4+/CD8+ ratio was 0.6(0.4-1.0), with 26.3% of subjects achieving CD4+/CD8+ ratio>1.

Of the expanded CD4+ T-cell subsets, 27.3(18.0-38.3)% were naïve, 36.8(29.0-40.0)% central memory and 27.4(20.0-38.5)% effector memory. Of CD8+ T-cells subsets, 16.5(10.2-25.5)% were naïve, 19.9(12.7-26.6)% central memory and 41.0(31.8-52.5)% effector memory. Adjusted for age, gender, ethnicity, Hepatitis C and current HIVRNA, total cumulative ART exposure(+0.15,p=0.007), higher nadir CD4+ count(+0.011,p<0.001) and higher %CD8+ naive T-cells(+0.0085,p<0.001) were associated with higher CD4+/CD8+ ratio, higher absolute CD8+ T-cell(-0.0044,p<0.001) and higher %CD4+ effector memory T-cells(-0.004,p=0.0036) were associated with lower CD4+/CD8+ ratio. Those with CD4+/CD8+ ratio>1 had significantly higher median %CD8+ naive T-cells; 25.4(14.0-36.0)% versus 14.4(9.4-21.6)%, p<0.0001, but significantly lower absolute CD8+ count; 464(384.5-567) versus 765(603-1084) cells/mm^3, p<0.001.

Conclusions: Study suggests important role for naïve CD8+ T-cell populations in normalisation of the immune response to HIV-infection. How these findings relate to persistent immune activation on ART requires further study.

OP7

Reduced high density lipoprotein cholesterol (HDLc) rather than elevated low density lipoprotein (LDLc) is the principal dyslipidaemia in HIV-positive subjects on contemporary antiretroviral therapy (ART)

Aoife G. Cotter, Caroline A. Sabin, Sibongile Simelane, Alan Macken, Brendan Rogers, Eoin Kavanagh, Jennifer J. Brady, Patrick W.G. Mallon on behalf of the 'Understanding the Pathology of Bone Disease in HIV Infected Subjects' (HIV UPBEAT) Study Group.

Background: Dyslipidaemia in HIV-positive subjects on contemporary ART remains to be fully characterised, with elevated total cholesterol, LDL-c and low HDL-c expected compared to HIV-negative subjects.

Methods: We compared fasting lipids (mmol/L) in a cohort of 210 HIV-positive and 264 HIV-negative subjects and assessed between-group differences in (TC), triglycerides, LDLc, HDLc, and TC:HDLc ratio in baseline samples using Mann-Whitney and Chi-squared tests and multivariable linear/logistic regression. Results are median [interquartile range] unless specified.

Results: The HIV-positive group was 58% male, 40% African, aged 39 [33-46] years and had been diagnosed with HIV 5[2-8] years previously. HIV acquisition risk was heterosexual (46.9%), homosexual sex (25.4%), intravenous drug use (18.7%); 89.2% were on ART (48.6% on protease inhibitors). The HIV-negative group was 43% male, 25% African, aged 42[34-49] years. Statin use was more common in the HIV-positives than in the HIV-negatives (12.6% vs. 3.1%, *P*=0.0002).

The HIV-positives had significantly lower TC (4.7 (4.0-5.4) vs. 4.9 (4.3-5.6), *P*= 0.01) and HDLc (1.1 (1.0-1.4) vs. 1.4(1.2-1.7), *P*=0.0001), higher triglycerides (1.1 (0.8-1.7) vs. 0.9 (0.6-1.2), *P*=0.0001) than the HIV-negatives and higher TC:HDLc (4.0 (3.3-4.8) vs. 3.4 (2.8-4.2), *P*=0.0001). There were no differences in LDLc (2.9 (2.3-3.4) vs. 3.0 (2.5-3.6), *P*=0.15). In the HIV-positive group, 35.3% had HDLc <1.034 mmol/L (40mg/dL) vs. 13.0% of the HIV-negative group (*P* =0.0001). HIV-positivity was significantly associated with lower HDLc and higher TC:HDLc after adjustment for gender, ethnicity, age and current smoking (adjusted odds ratios 3.6 and 2.7, *P*=0.0001 and 0.01 respectively). Adjustment for statin use did not alter the conclusions.

Conclusion: The principal dyslipidaemia associated with HIV is low HDLc rather than high LDLc, with increases in proatherogenic TC:HDLc ratio driven by low HDLc. Further research into the pathogenesis and therapeutic options for low HDLc in those with HIV is warranted.

OP8

Reliability and Validity of the HIV Disability Questionnaire (HDQ) with Adults Living with HIV in Canada and Ireland

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Background: The HIV Disability Questionnaire (HDQ) is a 69 item self-administered questionnaire, developed in Canada, that measures disability experienced by people living with HIV. Our purpose was to assess internal consistency reliability, and construct validity of the HDQ with adults living with HIV in Canada and Ireland.

Methods: We recruited adults with HIV from hospital clinics and AIDS service organizations in Ontario, Canada and Dublin, Ireland. We administered the HDQ along with health status and demographic questionnaires. We calculated HDQ disability presence, severity and episodic scores (scored from 0-100). We calculated internal consistency coefficients for the disability and episodic scores and considered coefficients >0.80 acceptable. To assess construct validity, we tested 40 *a priori* hypotheses of correlations between scores on the HDQ and other measures and two known group hypotheses based on age and comorbidity. We considered acceptance of at least 75% of hypotheses as demonstrating support for construct validity.

Results: Of the 235 participants (139 Canada; 96 Ireland), the majority were men taking antiretroviral therapy. Compared with Irish participants, Canadian participants were older and reported living with a higher median number of comorbidities. Highest median disability severity scores were in the uncertainty domain. HDQ severity and presence scores were higher among Canadian participants across all domain and total scores, except for uncertainty. The internal consistency coefficients for Irish and Canadian participants were 0.973 and 0.965 respectively, for the severity scale and 0.978 and 0.963, respectively, for the episodic scale. Of the 40 construct validity hypotheses, 32(80%) and 22(55%) were supported among the Canadian and Irish populations respectively; both (100%) known group hypotheses were also supported.

Conclusions: The HDQ demonstrates internal consistency reliability and construct validity when administered to adults living with HIV in Ontario and Ireland. Differences in validity between Canada and Ireland may be due to lower HDQ scores among Irish participants who were younger and reported less comorbidity, cultural differences, and differences in HDQ interpretation. Further work to explore HDQ applications outside of Canada is needed.

OP9

Immunological Efficacy of a Prime-Boost Vaccine Strategy Combining the 13-Valent Pneumococcal Conjugate Vaccine (PCV13) Followed by the 23-Valent Pneumococcal Polysaccharide Vaccine (PPV23) Versus PPV 23 Alone in HIV-Infected Adults

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Background: Invasive pneumococcal disease remains a significant cause of morbidity and mortality in HIV+ adults. PPV23 has been shown to have suboptimal immunogenicity in this group. Strategies such as priming with PCV13 followed by boosting with PPV23 may augment immune response. This single-centre randomised controlled trial assessed immunological efficacy of PCV13 + PPV 23 versus PPV 23 alone in HIV+ adults.

Methods: HIV+ adults ≥18 years with no prior history of pneumococcal vaccination with a CD4 count >200cells/mm^3 were randomised to receive PCV13 at week 0 + PPV23 at week 4 ("prime-boost" group, n=27) or PPV 23 alone at week 4 ("un-primed" group, n=33). Quantitative antibody titres for 12 pneumococcal polysaccharide serotypes (PPS) (1,3,4,5,6B,7F,9V,14,18C,19A,19F,23F) shared by both vaccines were measured at week 0, 8 and 28.
Proportion of responders (≥2-fold increase in antibody titre to ≥ 6 vaccine serotypes) and fold increase in PPS

IgG geometric mean titre (GMT) were compared. Wilcoxon and x^2 tests were used to compare IgG levels and categorical variables as appropriate.

Results: 60 patients (mean age [SD] 37[9] years, 92% male, mean CD4 count 503 [209] cells/mm^3, 47% on HAART, mean HIV RNA 4.5log_{10} copies/ml) were included. Baseline characteristics were well matched between groups.

Week 8 vaccine response rates were 88% and 86% in the prime-boost and un-primed group respectively (p=1). Week 8 fold increase in GMT was greater in the prime-boost group (mean [SD] 8.69 [4.61] vs. 4.49 [1.24], p<0.001) with significantly higher GMT for serotype 23F (3.20 vs. 0.52ug/ml, p=0.0038).

At week 28, proportion of responders was significantly higher in the prime-boost group (85% vs. 52%, p=0.01). Week 28 GMT in the prime-boost group were significantly higher for 4 serotypes; 1 (0.48 vs0.29ug/ml, p=0.05), 4 (0.83 vs. 0.42ug/ml, p=0.023), 19F (1.51 vs. 0.88ug/ml p=0.04), 23F (1.54 vs. 0.42ug/ml, p=0.013) and fold increase in GMT remained greater in the prime-boost group (4.39 [1.77] vs.2.47 [0.67], p=0.05).

Conclusions: The immunogenicity and durability of pneumococcal vaccine response was enhanced by the prime-boost vaccine strategy. Our study adds to evidence supporting recent changes in US pneumococcal vaccination recommendations and strengthens the call to review current pneumococcal vaccine guidelines in Europe.

OP10

Detection of recombination events in Hepatitis C virus

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Background: The phenomenon of Hepatitis C virus (HCV) recombination is rarely reported in the literature. In this study, we have used ultra-deep pyrosequencing (UDPS) to scrutinise a panel of sera where recombinants have previously been identified at the clonal level to confirm that recombination is an active mechanism used by HCV to explore novel sequence space.

Methods: Ten samples (RL1-10), encompassing 9.6 years of chronic HCV genotype 4a infection from a single, treatment-naïve patient were subjected to pyrosequencing analysis. Pyrosequencing was performed using the 454 GS FLX titanium platform (Roche 454 Life Sciences). The data was processed by the sequential application of algorithms k-mer error correction (KEC) and a customized version of empirical threshold (ET) informed with a reference dataset of 166 unique temporally matched clonal sequences.

Results: We report the detection of low frequency recombinants throughout the study. The data indicates that that the fitness quotients of recombinant daughter virions are too low to compete against the parental genomes. The sub-populations of parental genomes contributing to the recombination events highlighted a dynamic virome where compartmentalised sub-populations of variants are in competition.

Conclusion: Analysis of UDPS datasets derived from virus amplicons frequently relies on software tools that are not optimised for amplicon analysis, assume random incorporation of sequencing mutations and are focused on finding true sequences rather than false haplotypes. These difficulties are compounded by the presence of hypervariable regions present in RNA virus genomes. The temporally matched clonal dataset, together with an error correction methodology designed to overcome the problems outlined, facilitated the retention of valuable quasispecies information.

OP11

Effect of Switch from Abacavir to Tenofovir DF on Platelet Function Markers: a SWIFT Trial Sub-study

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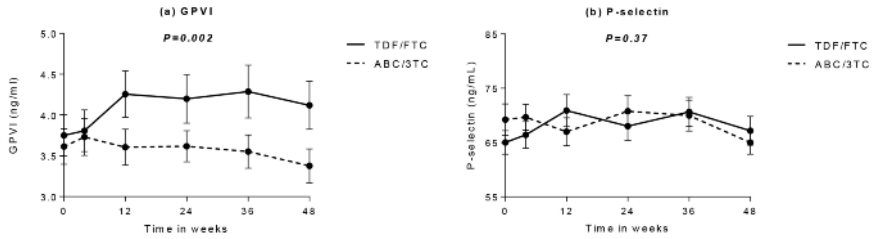
Background: Current and recent use of the NRTI, abacavir (ABC) is associated with increased risk of myocardial infarction, with both endothelial and platelet dysfunction implicated.

Methods: Changes in platelet function markers were examined in a sub-study of the SWIFT trial, a prospective, randomised trial of virally suppressed, HIV-positive subjects randomised to switch abacavir/lamivudine (ABC/3TC) to tenofovir DF/emtricitabine (TDF/FTC) or remain on ABC/3TC.

Figure 1. Change in markers of platelet function over time



Soluble glycoprotein VI (sGPVI), a marker of collagen-mediated platelet activation, and soluble P-selectin (sP-sel), involved in platelet-leukocyte interactions, were measured by ELISA in plasma collected at weeks 0, 4, 12, 24, 36 and 48. Changes in platelet markers over time were assessed using mixed effect models. Data are mean [SD] unless specified.

Results: Of 312 patients (age 46[9.3] years, 85% male, 65% caucasian), 156 switched to TDF/FTC. Groups were matched for baseline demographic and laboratory data including CD4+T-cells (TDF/TFC versus ABC/3TC, 548 [257], 582 [287]/µl respectively), platelets (244 [58], 253 [72]x10^3/µl), total cholesterol (5.4 [1.2], 5.3 [1.0]mmol/L), LDL (3.1 [1.0], 3.1 [0.8]mmol/L) and HDL (1.29 [0.38], 1.31 [0.42]mmol/L). There were no between-group differences in baseline sGPVI (mean (SEM) 3.75 [0.25]ng/ml versus 3.61 [0.22]ng/ml, p=0.68) or sP-sel (65.0 [2.2]ng/ml versus 69.2 [2.9]ng/ml, p=0.25) and no between-group differences in change in sP-sel to 48 weeks (p=0.37, figure 1b). However, relative to the ABC/3TC group, sGPVI increased in those switched to TDF/FTC (effect size +0.012 (95%CI 0.0041, 0.02), between group p=0.002, figure 1a). This effect persisted when corrected for age, ethnicity, history of dyslipidaemia or hypertension, baseline CD4+T-cell and platelet count and change from baseline to week 48 in creatinine, lipids, CD4+T-cell and platelet count.

Conclusions: Increases in sGPVI suggest changes in intrinsic platelet function on switching away from ABC/3TC to TDF/FTC. Further mechanistic research is required to determine the relevance of these changes to overall platelet reactivity and cardiovascular disease.

OP12

Campylobacter ureolyticus: an exercise in serendipity

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Background: Of 7194 diarrhoeal faecal samples processed by PCR over a year, 349 were positive for genus Campylobacter but 45% of these were culture negative by routine culture methods.

Methods/Results: A combination of Campylobacter-specific uniplex PCR and 16S rRNA sequencing confirmed the presence of Campylobacter DNA in these samples, and 83 of these 349 samples (23.8%) were positive by 16S RNA analysis for *C. ureolyticus*. The dynamics of *C ureolyticus* in symptomatic patients were examined and a seasonal variation was noted as was a higher prevalence at extremes of age. Preliminary data show that isolates were frequently from patients in long stay care or with chronic illness and immunosuppression.

An animal source of *C. ureolyticus* had not been described and was sought. We describe the molecular-based detection of this pathogen in bovine faeces (1/20) and unpasteurized milk (6/47) but not in poultry (chicken wings and caeca). Is *C. ureolyticus*, therefore, capable of entering the foodchain?

Comparative analysis and genetic searches against other *Campylobacter* species identified putative virulence factors in *C. ureolyticus* encompassing the known virulence tactics of pathogenic *Campylobacter* spp. including adhesion and colonisation, invasion and toxin production. We have now successfully cultured *C ureolyticus* and a selective medium has been developed. Animal studies are in progress.

Conclusion: Non-culturable *Campylobacter* spp. (most notably *C. ureolyticus*) may be responsible for a considerable proportion of human enteritis and the true incidence of infection is likely to be significantly underestimated where conventional Campylobacter culture methods are used in isolation. We conclude that *C. ureolyticus* may be an emerging gastrointestinal pathogen.

OP13

Safety and Efficacy of the Single Tablet Regimen Rilpivirine-Tenofovir-Emtricitabine (Eviplera®) in Clinical Practice

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Background: Eviplera (EVP; rilpivirine, tenofovir and emtricitabine) is licensed for use in the HIV-1 infected treatment-naïve patients whose baseline plasma viral load (VL) is less than 100,000 copies/mL. EVP also offers an attractive single tablet regime option for patients who require switching from their antiretroviral (ART) regimes. The aim of this study was to examine the efficacy of EVP in routine clinical practice.

Methods: An observational study was performed at our centre. Patients starting or switching to EVP as part of routine clinical care with an available VL measurement at the time of starting EVP were included. Patients were followed from date of starting EVP (baseline) until December 2013.

Results: 80 patients were included, of whom 75 (94%) were male, 47 (59%) were men who acquired HIV through sex with men and 67 (84%) were white. Age range was 20-70 years, median age was 41 years. 2 (2.5%) and 1 (1.25%) had chronic hepatitis C and chronic hepatitis B infections respectively.

Only 23 (29%) were ART-naive at baseline. A total of 57 ART-experienced patients switched to EVP; 44 (77%) due to ART toxicity (including 31 (54%) for CNS toxicity), 8 (14%) to decrease pill burden and 5 (8.7%) due to other or unknown reasons. At the time of switch to EVP, 57 (100%) patients had a VL<50 copies/ml.

Amongst 80 patients on EVP for more than 6 months, 77 (96%) including 20/23 (87%) of the naïve group and 57/57 (100%) in the switch group had a VL of <50 copies/mL. Amongst 39/80 (48.7%) patients on EVP for more than 12 months, 35/39 (90%) had a VL <50 copies/ml at 12 months. Results are comparable to those of a multi-centre collaborative observational cohort of patients taking EVP, where 958 patients are included to date, 90% of the naïve group and 95% of the switch group had a VL <50 at 6 months.

Conclusions: A high proportion of patients on EVP had undetectable VL at 6 months. All who switched to EVP continued with VL suppression at 6 months. A large proportion of the naive group had undetectable VL at 6 months and 12 months

OP14

Have we been doing what we should be doing? A splenectomy audit: Jan 2012 - December 2013

Laura Cooke, Dr. Karen Burns Beaumont Hospital, Dublin

Background: Asplenic patients are at increased infection risk. Counseling, immunisation, antimicrobial prophylaxis (AP) and communication are important. An audit of patients who underwent splenectomy in Beaumont Hospital in 2012 and 2013 was conducted.

Methods: HIPE records were searched for splenectomy. Healthcare records and electronic discharge letters (EDL) were reviewed and an Excel database constructed. Data collected included; documentation of communication with the patient and general practitioner (GP), immunisation and AP.

Results: Eleven patients underwent splenectomy during the two-year period. The average age was 50 years (range = 23-82 years) and six were female (55%). Five (45%) were immunosuppressed. Most were elective procedures (n=6; 55%), followed by unscheduled (n=4; 36%), with one classified as urgent-elective (9%).A discussion of the implications of splenectomy was documented for just four (36%) and the provision of a patient information leaflet for just two patients (18%). No patient had an obvious healthcare record alert regarding their asplenic status.

Of the 11 patients, there was documentation that eight had been immunised (73%). Three of the (50%) elective patients were immunised pre-operatively and the remaining five post-operatively. The majority of patients (n=10; 91%) were prescribed AP: Phenoxymethylpenicillin (n=9) and clarithromycin (n=1; penicillin allergy).

EDL were available for the majority (n=9; 82%). In all cases, the GP was informed of the splenectomy and in no case was there documentation of the patient receiving an information leaflet. Six EDL related to immunised patients and in all this was communicated.

The remaining three EDL related to non-immunised patients. However, this was communicated in just one. Six letters referred to AP. However, only one described the dose and duration.

Conclusion: There was good compliance with immunisation and AP after splenectomy. However, documentation of communication was suboptimal. Following this audit, the asplenia guidelines were updated and reaudit is planned.

POSTER PRESENTATIONS

Classified as follows:

BS: Basic Science
HH: Clinical Care, HIV, Hepatitis
ID: Clinical Care, Infectious Diseases
EPH: Epidemiology & Public Health
Ph: Pharmacology

BS1

Human Memory T cells are important in recovery from *Staphylococcus aureus* Bloodstream Infection

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Background: Little is known about the normal human immune response to infection with *Staphylococcus aureus*. To date, all completed anti-*S.aureus* vaccine trials have centred on the generation of protective antibodies and failed, despite showing promise in pre-clinical animal models. It is likely that generating humoral immunity alone may not be sufficient to confer protection against invasive *S.aureus* infection in humans.

It is unknown whether T cells are expanded following *S.aureus* exposure in humans, nor whether these cells can respond to *S.aureus* antigens at all. Future T cell targeted vaccine design must firstly identify which cells are most important in recovery from natural infection, and secondly which bacterial antigens are the most potent T cell activators in humans. This is the first study in humans aiming to answer these questions.

Methods: Immunocompetent adult patients (n=19) recovering from recent *S.aureus* or *E.coli* bloodstream infection and healthy volunteers were recruited. Peripheral blood mononuclear cells (PBMCs) were isolated on mean of day 7 post-bacteraemia and stained with CFSE before being cultured with heat-killed laboratory and clinical strains of *S.aureus* for 10 days. Cells were then stained for extracellular markers (CD3, CD4, CD8, CD45RO) and intracellular cytokines (IFNγ, IL-17A, IL-10) and processed for flow cytometric analysis on a BD FACS-LSRFortessa®.

Results: Recovery from SAB is associated with a greater expansion in lymphocytes over the initial 7 days than in ECB (0.9 vs 0.2 cells x 10^9/L increase, p=0.09). CD4+ T cells isolated from *S.aureus* bacteraemic patients demonstrate significantly increased levels of antigen-specific proliferation to heat-killed *S.aureus* as compared to *E.coli* control patients (16 vs 33% CFSElo CD4+, p=0.02). The majority of proliferating cells are CD45RO+, suggesting that they are circulating *S.aureus*-specific memory T cells expanded as a consequence of the recent exposure to the organism. These expanding cells exhibit a Th1-predominant phenotype.

Conclusions: Antigen-specific Th1 memory cells seem primed to *S. aureus* during recovery from bloodstream infection. This finding could be used in intelligent design of T cell-targeted anti-*S. aureus* vaccines.

BS2

Competitiveness-enhancing pathogen virulence gene expression and associated inducing molecules in human urine

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Background: The abundance of ethanolamine (EA) and 1,2-propanediol (PD) within the mammalian intestine has been hypothesized to provide certain pathogenic bacteria with a niche carbon/nitrogen source and signal enteric pathogens of their arrival in the small intestine. PD and EA metabolism may enhance competitive advantage for pathogen growth in body compartments where these compounds are present. *Salmonella*, *Escherichia coli* and *Klebsiella* utilise ethanolamine, while propanediol usage occurs in *Yersinia, Klebsiella, Salmonella* and *Clostridium.* These pathogens possess the *pdu* and/or *eut* operon(s), which encode relevant metabolic machinery in addition to a number of virulence genes which may be induced by pdu/eut regulatory genes. In a preliminary study, we detected PD and EA in human urine, demonstrated urinary pathogens

can metabolise these molecules *in vitro* and observed growth of bacteria possessing the operons in human urine.

Methods: 70 urine samples were obtained from Cork University Hospital, half of which were infected with coliform-type organisms. Gas and liquid chromatography mass spectrometry was used to quantify PD and EA in a cohort of 20 samples. PD metabolism was demonstrated in bacteriuric samples with PD-enriched agar. Using a *Escherichia coli* ECOR library and *K. pneumoniae* strain (NCIMB 132128), kinetic growth studies of *pdu/eut* positive bacteria in human urine were performed.
Results: Growth studies revealed *pdu/eut* positive bacteria grew well within human urine whether PD/EA supplemented or not. In tested urine samples (*n=19, 10 infected, 9 non-infected*) PD concentrations were trace to 8.8mM. EA concentrations were trace to 0.13mM. PD metabolism was demonstrated in two putative *Klebsiella spp*. bacteriuric isolates (n=15).

Conclusions: EA and PD are detectable and present within human urine with PD present in larger amounts. PD utilisation is known to occur in a minority of urinary pathogens. Future quantitative gene expression studies will be used to seek *pdu/eut* operon expression from urinary isolates.

BS3

Hepatitis C Virus Disruption of Lipid and Autophagy Pathways Provides an Opportunity for the Discovery of New Adjunct Therapies

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Hepatitis C virus (HCV) infects 2-3% of the world's population [1]. Treatment efficacy for genotypes 2 and 3 approaches 75-80% with dual therapy (pegylated interferon and ribavirin). Patients who fail therapy have no secondary treatment options, may develop steatosis and advance to end stage liver disease. HCV life cycle is dependent on lipid metabolism and usurps the early stages of the autophagy pathway to create an environment suitable for replication [2].

We have developed a reproducible *in vitro* infection model for serum derived HCV (sdHCV). The inability of HCV to complete a full cycle of replication *in vitro* is well established[3]. For this reason, there has been limited use of sdHCV in cell culture. However, we have shown the presence intracellular HCV proteins, core and NS3, up to 48hrs post-infection. As expected, we have observed core protein surrounding lipid droplets in hepatocytes. Displacement of the adipose differentiation related protein (ADRP) from the surface of lipid droplets by HCV core protein has been shown [4], we have confirmed this with our chosen *in vitro model*. It has been shown that autophagy proteins are required for the translation of incoming HCV RNA [5]. We have shown upregulation of early stage autophagy protein, Atg5, in hepatocytes infected with sdHCV. We have observed co-localisation of the proteins NS3 and Atg5 indicating the direct interaction of HCV proteins with autophagy proteins.

Having identified the new biology of NS3 and ATG5 interaction, I plan to further investigate how viral infection modulates lipid metabolism and autophagy.
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EPH1

Meropenem use in one large university hospital in Ireland

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Background: Since 2000, spread of community-acquired enterobacterial isolates (Escherichia coli) that produce extended-spectrum β-lactamases (ESBLs) capable of

hydrolyzing almost all cephalosporins except carbapenems has been reported worldwide. It is therefore mandatory to maintain the clinical efficacy of carbapenems which have become antimicrobial drugs of last resort.

Methods: This was a retrospective study on meropenem use in patients in a large Irish teaching hospital. All patients in our study centre who were being treated with meropenem on the 16th of October 2013 were identified though the antimicrobial pharmacist. Four weeks after this date we then conducted a chart review of all these patients to determine the documentation, duration and appropriateness of the use of meropenem. We also looked at how many of the patients had either microbiology or infectious diseases input into the choice and use of meropenem.

Results: A total of 16 patients on meropenem were identied by the antimicrobial pharmacist. 62.5% were men. They mean age was 62 (ranging fro 14 to 94). 14/16 had documented reasons for the use of meropenem with 5 being for neutropenic sepsis and 6 having previous history of ESBL. Of the 16 patients only one patient had no ID or microbiology input with two patients having both specialties involved. Nine patients had specialist input prior to commencing meropenem. Mean duration of meropenem use was 19 days (range 4-108 days). Five patients were from surgical specialties and three patients were from one medical specialty.
Only 2 patients were stated on meropenem inappropriately however the ongoing use of meropenem was inappropriate in 6 of the 16 patients. In two patients the meropenem was continued for a further three days before being deescalated. Five patients died while on meropenem and one patient had ongoing meropenem use.

Conclusion: As demonstrated by our audit, meropenem is being used inappropriately by physicians even when advised by microbiology and Infectious Disease specialists. With the emergence of carbapenem resistant organisisms we need to monitor and patrol the use of carbapenems and prevent the spread of these infections.

EPH2

Development of a rapid method to monitor for Verotoxigenic *Escherichia coli* (VTEC) in large water volumes

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Background: Ireland has the highest reported incidence of human infection with VTEC in Europe, with 408 cases confirmed in 2012. Water is recognised as an important transmission route.

Methods: This study describes the development and validation of a method for VTEC detection from large water volumes in under 24 hours. A filtration system consisting of a submersible pump, with pre-filter and 142 mm 0.45 µM filter, was evaluated for capture of VTEC using 10 L volumes of water inoculated with decreasing concentrations (to 10 CFU/L) of an *E. coli* O157:H7 (NCTC 12900), with and without a microbial background. Bacterial filters are enriched in buffered peptone water and VTEC is detected from enrichments by real-time PCR targeting virulence genes (*eae*, *vtx*1 and *vtx*2) and antigenic determinants for *E. coli* O157 and O26. CHROMagar™ STEC is used for strain isolation with and without immunomagnetic separation (IMS). The method was used to examine river water (up to 33 L) for VTEC and the method was validated for capture of VTEC in Group Water Scheme raw water by direct comparison with standard immunomagnetic separation methods (ISO 16654:2001).

Results: The limit of detection for the system was 10 CFU/L. Isolation of VTEC from enrichments testing positive by real-time PCR is a significant challenge, which can be addressed through the application of IMS and incubation of enrichment broths at 42 ^{0}C to reduce microbial background. VTEC was detected from river water using real-time PCR on four occasions and in a comparison of VTEC screening methods, this method detected VTEC in 13 out of 16 GWS (30 L) raw water samples where the standard method detected VTEC in 2 out of 16 (1 L) samples.

Conclusion: This is a rapid, convenient method for examination of large volumes of water for low-level VTEC contamination.

EPH3

Pharyngeal gonorrhoea infection in MSM in a multi-ethnic STI service at UL Hospitals

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Background: Pharyngeal infection with gonorrhoea (GC) may not be identified if screening is limited to the collection of routine urethral, urine or rectal specimens only. The prevalence of pharyngeal GC in men who have sex with men (MSM) has been quoted as 5 – 10%. No data on these rates is available in Limerick.
The objective of this study was to determine the rate of pharyngeal infection with GC in MSM population attending an ambulatory multi-ethnic STI service at UL Hospitals.

Methods: Study period: 01/01/2013 – 31/12/2013. A retrospective unselected observational design was employed that looked at data obtained from: (1) UHL iLab system, (2) enhanced surveillance records in DPH and (3) CIDR reports. Data was collated and entered into an Excel spreadsheet for analysis.

Results: A total of 357 pharyngeal swabs were requested from STI service at UHL. Thirteen (3.6%) were positive for GC. Among the individuals with GC pharyngeal infections, three (23.1%) had a positive GC rectal swab test only, one (7.7%) had a positive GC urine test and two (15.4%) had positive GC at three sites. Seven (53.8%) were pharyngeal positive only.

Conclusion: The prevalence of pharyngeal GC in MSM population attending the STI service at UL Hospitals is slightly lower than levels quoted internationally. However, more than half of the cases had the pharynx as the only site of infection, and this highlights the importance of undertaking extra-genital testing within the MSM population.

HH1

Exploring Episodic Disability Experienced by Adults Living with HIV in Ireland: A Qualitative Study

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Background: The *Episodic Disability Framework* was developed from the perspective of adults living with HIV in Canada who conceptualized the health-related challenges living with HIV as multi-dimensional and episodic in nature. The *Framework* consists of: 1) *dimensions of disability*, defined as physical, cognitive, mental and emotional symptoms and impairments, difficulties carrying out day-to-day activities, challenges to social inclusion, and uncertainty or worrying about the future; and 2) *contextual factors* defined as extrinsic factors (social support and stigma) and intrinsic factors (living strategies and personal attributes) that may exacerbate or alleviate disability. The purpose of this study was to explore the experience of disability from the perspective of adults living with HIV in Ireland in relation to the *Episodic Disability Framework*.

Methods: We conducted face-to-face semi-structured interviews with adults living with HIV. We recruited participants from a hospital clinic and community-based organization in Dublin, Ireland. We asked participants to describe their health-related challenges, the extent to which these challenges were episodic in nature, and the impact on their overall health. All interviews were audio-recorded and transcribed verbatim. We analyzed data using directed content analytical techniques.

Results: Of the twelve participants (9 men; 3 women), the majority were taking antiretroviral therapy (92%), with a median time since HIV diagnosis of 12 years, and undetectable viral load (83%). Participants described health challenges that spanned disability dimensions including: physical, cognitive, mental and emotional symptoms and impairments (some of which were experienced as episodic), challenges to social inclusion (employment, personal relationships), and uncertainty or worrying about the future aging with HIV. Health challenges were exacerbated by stigma and fear of HIV disclosure. Despite the challenges, participants described living strategies (lifestyle, positive outlook, resiliency, maintaining control, faith) and social support (family, friends, health services and practitioners) as factors that mitigated their disability.

Conclusions: Disability experienced by adults with HIV in this study aligned with components in the *Episodic Disability Framework*. Resiliency and positive outlook helped to minimize perceived health challenges experienced by adults with HIV. These dimensions of disability and contextual factors may be considered by health providers in HIV clinical practice.

HH2

An audit of suitability for six-monthly reviews of HIV positive patients on anti-retroviral therapy

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Background: HIV is a disease with growing prevalence; approximately 400 patients on anti-retroviral therapy (ART) attend the once-weekly, public Cork University Hospital (CUH) HIV Clinic at present. This has risen from 166 patients on ART in 2008 demonstrating the growing number of clinic slots required annually. The purpose of this audit was to establish whether it would be feasible to reduce the visit frequency of virally suppressed patients on ART who are completely well.

Methods: Five consecutive clinics were audited retrospectively with an end point of 12th January 2013, six months prior to the start date. A cohort of 100 consecutive patients receiving anti-retroviral therapy (ART) from 5th December 2012 until 9th January 2013 was evaluated over the course of twelve months. Those patients with a CD4 count greater than 350 cells/µL and a VL less than 50 copies/mL are deemed to be clinically well and can attend less frequently once they are considered entirely healthy under all auspices of the biopsychosocial model by the specialist HIV nurses.

Results: Of 100 patients receiving antiretroviral therapy, 50 were virally suppressed. Of those, it was established that 26 could safely be seen twice as opposed to three times a year. Following up these patients nine months later, it was found that although various barriers to less frequent clinic attendances had arisen for seven of this group, no major complications had arisen that were in anyway related to progression of their HIV.

Conclusion: HIV incidence is increasing and as treatment regimens improve, the life span of treatment compliant patients is lengthening. The average attendance at the CUH HIV clinic is three times per year and reducing this to twice a year for those who are deemed well will provide much needed spaces for both existing patients and new attendees.

HIV3

Identification and management of potential drug interactions by pharmacists in a Hepatitis C outpatient clinic in St. James's Hospital.

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The Department of GU Medicine and Infectious Diseases (GUIDE), St. James's Hospital (SJH) provides a viral hepatitis service reviewing 1,500 – 2,000 patients per annum. Many patients are being treated for co-morbidities and are taking concomitant medications in addition to being treated with direct acting antiviral (DAA) based triple therapy for Hepatitis C (peg-interferon alfa, ribavirin and a DAA, either telaprevir or boceprevir). No Irish studies to date have examined management of potential drug interactions in this patient group.

Aims:
To describe the number and pharmaceutical class of concomitant medications within the study population.
To audit the frequency and management of potential drug interactions identified in patients treated for Hepatitis C with DAA based triple therapy.

All patients treated for Hepatitis C with triple therapy in the GUIDE clinic over the last 12 months (Jan 2013- Jan 2014) were included in the study. (N = 32) A standardised drug interaction check list incorporating a range of drug interaction references was utilised to complete drug interaction checks for patients in the study group. All potential drug interactions were discussed with the prescribing physician and actions taken were based on the severity of the potential drug interaction.

32 patients were included in the study with a total of 128 concomitant medicines prescribed for management of co-morbidities. 91% of patients were taking concomitant medicines with an average of 4 per patient. 81% of patients were prescribed concomitant medicines with the potential for drug interactions with DAA based therapy. 59% of patients required changes to be made to their concomitant medicines before initiation of DAA based therapy due to potential drug interactions.

The study results identified the high incidence of potential drug interactions in patients being treated for Hepatitis C using DAA based regimens. The unique knowledge of pharmacists in reviewing and assessing the severity of these interactions is key to the safe management of patients during treatment.

HIV4

Use of hospital services by HIV patients, 2012

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Background: Information on the pattern of health services use by HIV patients is required to effectively plan services, particularly in light of increasing non-infectious chronic diseases in this population. This study examined the use of inpatient, outpatient, and emergency department (ED) services by HIV positive patients who attended Cork University Hospital (CUH) for HIV care in 2012.

Methods: All public HIV patients who attended CUH for inpatient or outpatient care in 2012 were identified using an existing clinical database. Data on outpatient appointments by speciality (excluding dialysis), ED visits and inpatient episodes were extracted from the hospital information system. Patients with no attendance between Jul-Dec were deemed lost-to-follow-up and were censored at the month of last visit.

Results: Data were extracted on 326 patients (3607 patient-months), with 1825 outpatient visits attended (1126 ID, 307 other), 99 ED visits (59 patients) and 76 inpatient episodes (52 patients). The average number of patient-months was 5.7 for those diagnosed in 2012 and 11.4 for those diagnosed previously. Patients had a median of 3 ID outpatient visits (range 0-12), 26% of patients also attended other outpatient specialties (median 2, range 1-26). Patients did not attend 12% of ID and 22% of other outpatient appointments. Those newly diagnosed in 2012 used more inpatient (39% vs 15%, p=0.01), ED (39% vs 17%, p=0.02), and more outpatient ID services (annualised median visits 8 vs 3, p<0.0001) compared to those previously diagnosed. Patients ≥50 years of age had fewer ID outpatient visits (p<0.0001). Males and late diagnoses used ED services more frequently (p=0.01 and p=0.05 respectively).

Conclusions: These data provide baseline information on the utilisation rates of ID and other specialities by HIV positive patients. Such data are useful for identifying factors which could be targeted for quality improvement interventions as well as for estimating future service requirements.

HH5

Retention in HIV care: comparison of measures and associated factors

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Background: Poor retention rates negatively impact HIV outcomes. This study aimed to estimate the retention rates of HIV patients who attended Cork University Hospital (CUH) 1997-2013 and to identify associated factors.

Methods: Three measures of retention were calculated based on dates of viral loads and CD4 counts: A) patients were categorised into three groups, based on duration of their longest gap(s) in care (≤ 6 months, 7-12 months, >12 months) and the proportion of time not spent in a gap >6 months was calculated B) proportion of 4 month periods with at least one visit and C) proportion of years in care with ≥ 2 visits >90 days apart. Patients with less than 6 months of care were excluded. Correlation and regression analyses were performed to investigate relationships between the measures and with patient factors (age group at first visit, gender, Irish nationality, risk factor and years since first visit)

Results: Data on 566 patients, 40913 months of care, were analysed. 46% of patients had no gaps > 6 months, 40% had gaps of 7-12 months duration, while 13% of patients had at least one gap over 12 months. Retention rates were 89% (measure A), 88% (measure B) and 86% (measure C). All three measures were strongly correlated (concordance correlation coefficients: A-B=0.9; A-C=0.72 and B-C=0.66. For measures A and B those who started care within the last 5 years had significantly higher retention rates than those who initiated care before that and injecting drug users had

significantly lower retention rates than other risk groups. No factor was significantly associated with measure C.

Conclusions: Retention rates in CUH are comparable to those reported in the international literature, a particularly positive finding is that nearly all groups of patients had similar levels of retention, with only IDUs having lower retention rates.

HH6

Lower bone mineral density independently associated with both increased bone turnover and HIV-1 infection in HIV-positive subjects compared to HIV-negative subjects.

Aoife G. Cotter, Caroline A. Sabin, Sibongile Simelane, Alan Macken, Brendan Rogers, Eoin Kavanagh, Jennifer J. Brady, Patrick W.G. Mallon on behalf of the 'Understanding the Pathology of Bone Disease in HIV-infected Subjects' (HIV UPBEAT) Study Group.

Background: The pathogenesis of low bone mineral density (BMD) in HIV is not fully elucidated. Elevated bone turnover markers (BTMs) suggest increased bone turnover. We aimed to determine relationships between HIV, BTMs and BMD.

Methods: In a prospective cohort study of HIV positive (HIV+) and negative (HIV-) subjects from similar demographic backgrounds, we collected demographic, clinical/ medication history and performed dual xray absorptiometry at femoral neck (FN), total hip (TH) and lumbar spine (LS) and fasting bloods (including 25-hydroxy-vitamin D (25(OH)D), parathyroid hormone (PTH) and BTMs: markers of formation (osteocalcin (OC), procollagen type 1 amino-terminal propeptide (P1NP) and resorption (C-terminal cross-linking telopeptide of type 1 collagen (CTX-1). We assessed baseline between-group differences in BTMs and associations between BTMs and BMD using t-tests, Pearson correlation and multivariable linear regression. Results are mean[SD] unless specified.

Results: Of 474 subjects, the HIV+ group (N=210) was 58% male, 40% African (median[IQR] age39[33, 46]years); HIV acquisition risk was heterosexual (46.9%), homosexual sex (25.4%),intravenous drug use (18.7%). The HIV- group (N=264) was 43% male, 25% African (median[IQR]age 42[34, 49]years). The HIV+ group had significantly higher bone turnover, with increased markers of bone resorption (CTX-1: 0.482[0.227]µg/L versus 0.381[0.195]µg/L) and formation (OC:23.2[10.7]µg/L versus 18.4[8.3]µg/L and P1NP: 54.8[26.8]µg/L versus 43.6[28.2]µg/L) in HIV+versus HIV-groups respectively, all P <0.0001. HIV remained independently associated with higher BTMs after adjustment for age, gender, ethnicity, 25(OH)D and PTH. Higher BTMs correlated with lower FN-, TH- and LS-BMD (r=-0.20 to -0.32, P <0.0001). HIV infection was independently associated with 0.068g/cm2 lower FN-BMD after adjustment for gender, ethnicity, age, smoking, education and body mass index. After further adjustment for OC, P1NP or CTX-1, HIV remained independently associated with lower BMD, albeit with a reduced effect size (0.051 to 0.056 g/cm2, all P <0.0001). Similar effects were seen at TH and LS.

Conclusion: In this study of HIV+ and HIV- subjects, lower BMD is associated with both HIV infection and higher bone turnover. However, higher BTMs only partially explain the effect of HIV on BMD. Further analysis is required to determine the effect of antiretroviral therapy on both BTMs and BMD.

HH7

The Evolving Cost of HIV Care in CUH: An Investigation of the Costs of Pharmaceutical Intervention

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Background: The introduction of HAART has lead to decreased morbidity and mortality in HIV infected patients. The majority of HIV care is now performed in an ambulatory care setting. New classes of antiretroviral drugs are more expensive than the older generations of therapeutics and thus pharmaceutical costs in the treatment of HIV are set to increase with use of newer agents. The concurrent increase in patient survival and the increasing prevalence of HIV in the population has been associated with a higher financial burden on the health service provider.

Aim: To determine the pharmaceutical costs of treating the HIV infected cohort in Cork University Hospital with HAART therapy and subsequently identify populations who are predisposed to increased pharmaceutical costs.

Method: Details of patients' treatment regimens were obtained via a retrospective chart review in CUH. Costing data was obtained from the Pharmacy

Department. Information on the demographics of the cohort, including age, sex, HIV viral load, and hospital admissions, was obtained from the Pharmacy Department, CUH internal databases, and Hospital Inpatient Enquiry Dept.

Results: From a sample size of 384 patients, the predicted yearly costs, based on information from August 2013, is €5.1 million. The average cost of treatment is €13,269.90 per person per annum. There were 175 patients prescribed the more expensive Protease Inhibitor regimens with the remaining 209 on Non-Protease Inhibitor based regimens. Females are 2.5 times more likely to be on a Protease Inhibitor based regimen compared to males, while patients are 6% less likely to be prescribed a Protease Inhibitor for each increase in year of age.

Conclusion: The pharmaceutical cost of treating patients with HIV infection in CUH is €5.1 million. The cohort is well controlled with the vast majority virally suppressed. The information presented here aims to inform governing bodies with regard to resource provision, allowing the most effective strategic distribution of diminishing resources to achieve maximum benefit.

HH8

Knowledge of and Attitudes to HIV in General Practice.

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Western Training Programme in General Practice

Background: There is a paucity of literature available on the attitudes of GPs towards HIV in the community. There is no national policy on HIV testing in primary care in Ireland. The most up to date statistics indicate a slight increase in new cases diagnosed here in 2012 (341), this is higher than the EU incidence (5.7/100,000). Late presentations represent a missed opportunity for timely treatment and prevention of transmission. Awareness of HIV and indications for testing could reduce the number of late diagnoses.

Methods: 263 anonymous questionnaires were posted to General Practitioners in Galway and Mayo. The study aimed to establish GPs' knowledge of and attitudes towards HIV. The objectives were to evaluate GP's experience of testing for and diagnosing HIV, knowledge of current guidelines and to explore attitudes towards HIV testing. The study employed an embedded mixed method design which allowed collection and analysis of quantitative and qualitative data. The quantitative section was analysed using SPSS statistical analysis software. The qualitative data was transcribed, coded and thematically analysed.

We received ethical approval and funding from the Irish College of General Practitioners.

Results: Response rate 48% (N=126). Over 50% of respondents have a HIV positive patient in their practice (N=71). The majority of GPs are testing for HIV (88%, N=111). Urban based doctors are more likely to test (p= 0.005) despite the fact that the number of practices with a HIV positive patient was equal in urban and rural settings.

The qualitative themes identified were; daily manifestations of HIV in clinical practice, readiness to engage with HIV care and challenges in practice.

Conclusion: The study shows a willingness among GPs to engage positively with HIV care. Respondents acknowledged a need to change both doctor and patient perceptions. General practitioners would welcome the introduction of HIV guidelines for primary care.

HH9

Investigation of E1E2 Glycoprotein in Hepatitis C Virus

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Hepatitis C virus (HCV) is an enveloped virus which circulates in infected individuals as quasispecies .HCV encodes two highly glycosylated envelope glycoproteins E1E2. The E1E2 complex is involved in fusion and entry of virus into the hepatocytes. E1E2 is hypervariable in nature and is a target of humoral immune system. The immune system produces antibodies against susceptible virions which are removed from the heterogenous virus population leading to the emergence of virions with modulated surface glycoproteins.

The objective of the current study involves separation of IgG enriched and IgG depleted fraction of quasispecies followed by amplification and analysis of E1E2

glycoprotein to identify neutralizing epitopes in E1E2 receptor binding domain.

Serum samples from a panel of viraemic sera positive for different HCV genotypes will be randomly selected. Samples will be separated into IgG enriched and IgG-depleted fractions using Ab Spin Trap ™ columns which has Protein G Sepharose ™ high Performance medium. The separated fractions will be amplified and sequenced for full length E1E2 glycoprotien. Sequence comparison between the IgG-enriched and depleted fractions will give an insight into mutations, possible glycosylation sites and neutralizing epitopes in E1E2 glycoprotein. For the exploration of E1E2, I have optimised the PCR conditions for full length amplification of E1E2 of genotypes 1a, 1b, 3a, 4a and 4e.

The outcome of the project will be improving our understanding about role of E1E2 glycoproteins in adaptive immunovirology of HCV.

ID1

Evolution of an Infectious Diseases Consult service

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Background: In July 2004, the first consultant Infectious Disease (ID) physician was appointed in a tertiary referral hospital. An ID consult service for the hospital was established. As far as was possible, a same day consultation service was provided. A registrar was appointed concomitantly.

Methods: The aim was to assess the evolution of the ID consult service over the past 9 years since its establishment. An audit of the consult service was carried out in 2008. The activity of the first nine months of the consult service; July 2004 until March 2005; was compared to the activity in July 2007 until March 2008 and July 2013 until March 2014. All consults have been recorded since the establishment of the service. Patient's name, hospital number, diagnosis and referring service's specialty have been documented. Mean activity was analysed by T test.

Results: During the first nine month period there were 65 consult requests compared to 191 and 262 , in the same time period 3 years and 9 years later respectively. The most notable changes were in Orthopaedics (0-15 - 37 consults), general surgery (7-40-80) and endocrinology (2-15-31). This rise in endocrinology consults occurred despite the establishment of a dedicated diabetic foot round service which is not included in this dataset. The number of haematology-oncology consults fell (12-40-20) which may reflect the introduction of microbiology MDT meetings with these subspecialties. The greatest increase in consults was assessment for outpatient parenteral antimicrobial therapy (OPAT) which represented 46 consults; half of these where suitable for OPAT. A total of 32 patients were discharged on OPAT during this time period.

Conclusion: The significant expansion and utilisation of this consult service reinforces the importance of Infectious Diseases as a subspecialty in tertiary care hospitals. The rapid expansion may represent the emergence of resistant organisms and the need for specialist involvement and may also reflect the roll out of OPAT which is monitored solely by the Infectious Disease team in our institution.

ID2

Safety and Efficacy of the Single Tablet Regimen Rilpivirine-Tenofovir-Emtricitabine (Eviplera®) in Clinical Practice.

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Background: Eviplera (EVP; rilpivirine, tenofovir and emtricitabine) is licensed for use in the HIV-1 infected treatment-naïve patients whose baseline plasma viral load (VL) is less than 100,000 copies/mL. EVP also offers an attractive single tablet regime option for patients who require switching from their antiretroviral (ART) regimes. The aim of this study was to examine the efficacy of EVP in routine clinical practice.

Methods: An observational study was performed at our centre. Patients starting or switching to EVP as part of routine clinical care with an available VL measurement at the time of starting EVP were included. Patients were followed from date of starting EVP (baseline) until December 2013.

Results: 80 patients were included, of whom 75 (94%) were male, 47 (59%) were men who acquired HIV through sex with men and 67 (84%) were white. Age

range was 20-70 years, median age was 41 years. 2 (2.5%) and 1 (1.25%) had chronic hepatitis C and chronic hepatitis B infections respectively.

Only 23 (29%) were ART-naive at baseline. A total of 57 ART-experienced patients switched to EVP; 44 (77%) due to ART toxicity (including 31 (54%) for CNS toxicity), 8 (14%) to decrease pill burden and 5 (8.7%) due to other or unknown reasons. At the time of switch to EVP, 57 (100%) patients had a VL<50 copies/ml.

Amongst 80 patients on EVP for more than 6 months, 77 (96%) including 20/23 (87%) of the naïve group and 57/57 (100%) in the switch group had a VL of <50 copies/mL. Amongst 39/80 (48.7%) patients on EVP for more than 12 months, 35/39 (90%) had a VL <50 copies/ml at 12 months. Results are comparable to those of a multi-centre collaborative observational cohort of patients taking EVP, where 958 patients are included to date, 90% of the naïve group and 95% of the switch group had a VL <50 at 6 months.

Conclusions: A high proportion of patients on EVP had undetectable VL at 6 months. All who switched to EVP continued with VL suppression at 6 months. A large proportion of the naive group had undetectable VL at 6 months and 12 months.

ID3

Granulicatella adiacens associated endocarditis: A Case Report.

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Introduction: *Granulicatella adiacens* is a catalase negative, oxidase negative, facultative anaerobic Gram positive coccus that can be a normal component of the oral flora but has been significantly associated with bacterial endocarditis. *Granulicatella* spp. are uncommon clinical isolates that in the past were grouped as nutritionally variant streptococci. Its isolation with traditional laboratory techniques is difficult but has been improved with the advent of molecular detection mechanisms. In this case report we present a complicated case of infection with *Granulicatella adiacens*.

Case description: A 35 year old man presented with expressive dysphasia and right-sided facial droop and was diagnosed with an acute stroke. His background was significant for a ventricular septal defect and gender identity disorder. Prior to admission he was under investigation for anaemia and significant weight loss. He developed persistent pyrexia while an inpatient and blood cultures were collected. After 15 hours incubation, blood cultures demonstrated Gram positive cocci morphologically suggestive of streptococci, with subsequent hazy growth on blood and chocolate agar. MALDI-TOF identified the isolate as *Ganaulicatella adiacens*. A trans-oesophageal echocardiogram noted mobile echodensities on aortic, mitral and tricuspid valves. CT abdomen demonstrated multiple splenic artery aneurysms.

Treatment was commenced with high dose intravenous amoxicillin and synergistic gentamicin. The amoxicillin was changed to benzylpenicillin based on the penicillin MIC result of 0.023ug/ml. The patient underwent aortic valve replacement, mitral and tricuspid valve repair and splenectomy as part of his management.

Conclusion: In conclusion, this patient developed *Granulicatella adiacens* endocarditis, with associated complications secondary to septic emboli, including splenic artery mycotic aneurysms and stroke, demonstrating the clinical significance of this organism and its association with endocarditis with a propensity for complications including metastatic infection. The case is a reminder of the varied clinical presentations of infective endocarditis and the need to consider endocarditis in patients presenting with stroke.

ID4

Initial management and brain imaging of adult patients with suspected bacterial meningitis in a Dublin teaching hospital: a retrospective study

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Background: Bacterial meningitis is a medical emergency, requiring rapid diagnosis via lumbar puncture (LP) and prompt treatment with appropriate antibiotics. This rapid assessment can be hindered by the pervasive myth that all patients with suspected meningitis require a CT brain prior to LP—in fact, the Infectious Diseases Society of America (IDSA) and the British Infection Society (BIS) have clear guidelines specifying the patients for whom CT is mandatory. We

set out to review the extent of this practice in our institution.

Methods: A retrospective review was performed of electronic medical records of all patients who had undergone CT brain and LP over a six month period. Only patients who were suspected of having bacterial meningitis were included. We determined whether the CT brain was indicated based on the IDSA/BIS criteria, as well as analysing the general management of these patients.

Results: The search yielded 65 patients, 23% of whom (n=15) were suspected of having bacterial meningitis. 13.3% of these (n=2) were ultimately diagnosed with meningitis. 86.6% (n=13) had blood cultures taken and 80% (n=12) received antibiotics, which were administered within a median time of 2 hours from their initial assessment. All but one patient received antibiotics prior to their LP, and the mean time between assessment and LP was 11.5 hours (range 3—36 hours). No LPs were performed by emergency physicians. 53.3% (n=8) of the CT scans were not indicated based on the IDSA/BIS criteria.

Conclusion: While patients with suspected meningitis in our institution are administered antibiotics in a timely fashion, there are significant delays between presentation and diagnostic LP. The aetiology of these delays is multifactorial, but is likely to be largely due to the acquisition of unnecessary CT scans and confusion regarding who should perform the LP. This problem is unlikely to be confined to our institution, and specific education of junior hospital doctors would be expected to improve practice in this regard.

ID5

Staphylococcus aureus Bloodstream Infection is not reliably recorded in hospital discharge summaries

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Background: *Staphylococcus aureus* bloodstream infection (SAB) is a medical diagnosis of huge clinical significance. It carries a 30-day mortality of 20-30%, high rates of disease complications, frequent recurrences and potential treatment-associated adverse events. It also significantly increases length of stay and costs. The Health Information and Quality Authority (HIQA) have launched a National Standard for Patient Discharge Summary Information. It recommends that "complete, relevant, reliable and valid information regarding the patient's stay in hospital is sent to the primary care healthcare professional in a timely manner, allowing the primary care healthcare professional to continue care and management following discharge."

The Health Service Executive (HSE) aims to move to a *'Money Follows* the P*atient'* approach on a shadow basis in 2013 and commence funding on this basis in 2014. The sources of information to reimburse institutions for patient activity are as yet undecided and discharge summaries may be one of these.

Methods: Discharge summaries of all patients of an urban tertiary care centre who had a positive blood culture for *Staphylococcus aureus* in the first 6 months of 2013 were reviewed. Two-tailed Fisher's exact tests were used for comparisons where appropriate.

Results: Thirty-two patients had at least one blood culture which grew *Staphylococcus aureus* during the study period. Discharge summaries had been written for 63% (n=20) of patients. Twenty-two percent (n=7) died during their admissions, and discharge summaries were not completed for any of these patients. Thus there was an 80% completion rate for patients discharged alive.

SAB was recorded as a diagnosis on 50% of patients with the infection, and 80% of those discharged alive. There was no difference in the inclusion of SAB between medical and surgical services (p=1.00), nor when comparing discharges from Infectious Diseases versus other services (p=0.39). Follow-up was arranged for 74% of live discharges. Treatment duration was documented for 47% (n=15) with a mean of 3.5 weeks (95% CI 2.3-4.7). All those treated for over 2 weeks were seen by Infectious Diseases. Half of treatments were completed in hospital.

Conclusions: *Staphylococcus aureus* bloodstream infections are poorly recorded on patient discharge documentation, considering the associated health implications and economic costs. Included data does not meet HIQA standards and is not an appropriate measure of casemix activity.

ID6

A multidisciplinary, qualitative study investigating the factors influencing antibiotic prescribing in Long Term Care Facilities in Ireland.

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Background: Antibiotic prescribing in Long Term Care Facilities (LTCF) is often not in adherence to antibiotic prescribing guidelines. In order to improve these practices it is necessary to identify the key areas on which to focus antibiotic stewardship activities. This study sought to examine the attitudes and opinions surrounding antibiotic prescribing in LTCF by interviewing the key stakeholders involved, and thus identify areas for future interventions.

Methods: Ethical approval was obtained from the Clinical Research Ethics Committee of the Cork Teaching Hospitals. A qualitative study design was employed by conducting semi-structured interviews with pharmacists, nurses, doctors and Consultants/specialists who work in the LTCF setting. Content analysis was conducted and the resulting themes were coded into the domains of the TDF in order to study the behavioural influences on antibiotic prescribing in LTCF. QSR International's NVivo 10 qualitative data analysis software was used to organise the data analysis.

Results: Interviews were conducted with 9 community pharmacists, 14 nurses, 14 general practice doctors and 4 consultants/specialists. Participants noted the influence of LTCF Environmental context and resources, and the complexity of the patients on their decision making when antibiotic prescribing. The Social Influences identified included the pressure put on doctors by patient's families and/or nurses to prescribe. The lack of Knowledge or implementation of the recommendations of local antibiotic prescribing guidelines was evident in most interviews. In terms of Behavioural Regulation participants felt that antibiotic prescribing at their LTCF has improved recently, but most recommended the need to monitor antibiotic prescribing patterns.

Conclusion: The findings have significant implications for the development future antimicrobial stewardship strategies in LTCF. By considering the views and targeting the behaviours of health care professionals, the acceptability and effectiveness of future interventions to improve antibiotic prescribing in LTCF would be greatly enhanced.

ID7

Infection and biological therapy in Rheumatoid Arthritis and Ankylosing Spondylitis

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Background: Biological agents significantly increase risk of infection especially in the first twelve months of treatment. The objective of this study was to assess characteristics associated with infection (serious and non- serious) in patients with rheumatoid arthritis (RA) and ankylosing spondylitis (AS) during the first year of treatment with a biological agent.

Methods: Data on 63 patients receiving biological treatment for RA or AS was collected. A manual review of patients charts was performed and the following data were extracted: demographic data, underlying rheumatological condition, history of prior exposure to biological agents, the number and type of prevalent infections as documented in patient charts during the first year of treatment.

Results: 63 patients were included in this study (35 males (56%), median age 50.8 years (IQR 41 – 60)). 42 patients (67%) had a diagnosis of RA; 21 (33%) of AS. 50 (79%) were on anti-TNF agents (etanercept 27 (43%), adalimumab 13 (21%), golimumab 8 (13%), certulizumab 2 (3%)). Other agents included abatacept 7 (11%), tocolizumab 4 (6%), and rituximab 2 (3%).
21 (33%) had a documented infection during the first year of therapy. The infection group was older with a mean age of 55 years versus 49 years in non-infection group (p=0.08). 8 (38%) of the group who developed infection had prior exposure to other biological agents compared to 14 (33%) in the non-infection group (RR 1.14, 95% CI 0.6-2.3). 16 (76%) had a diagnosis of RA compared with 26 (62%) in the group that didn't develop infection (RR 1.2, 95% CI 0.9-1.7).

Conclusion: Patient characteristics including age, underlying diagnosis and prior treatment with biological therapy may increase infection risk with biological agents during the first year of treatment.

ID8

Door to needle time –An audit of delay in intravenous antibiotic administration in an Irish Tertiary Hospital

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Background: Early antibiotic administration in severe infections significantly reduces mortality and shortens hospital stay (1,2). Intravenous (IV) antibiotics should be given within 1 hour of recognition of the infection (3).

Methods: This audit measured the time taken for patients contacting emergency services with an acute infection to receive their first dose of IV antibiotics. Antibiotic prescription practices were also assessed. Audit was based on national guidelines (4). Records of 49 non-consecutive patients were assessed retrospectively.

Results: Complete data, including hospital registration time and administration time of the first dose of IV antibiotics, were available for 48 patients. The median time lapse between registration and the first dose of IV antibiotics was 353 (interquartile range 223-600) minutes. Where the time of antibiotic prescription was documented (n=27/49, 54%), the median time lapse between prescription and administration of IV antibiotics was 60 (interquartile range 5-180) minutes. Indication for antibiotics was given in 45/49 (92%). Intended duration of antibiotic therapy was documented in 2/49 (4%). Relevant microbiology specimens were collected in 19/49 (39%), with 10 (53%) of these prior to administration of IV antibiotics.

Conclusion: This audit demonstrates that clinically significant delays occur in administration of IV antibiotics. Also, documentation of administration and planned duration of antibiotics, and microbiology specimen acquisition are suboptimal. These areas require improvement to meet the recommended standards.

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ID9

A review of the use of suppressive and prophylactic antibiotics in skin, soft tissue, bone and joint infections.

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Background: Chronic skin, soft tissue, bone and joint infections are a major cause of morbidity and mortality in an aging population. Treatment of these infections can be difficult at times and involves prolonged use of antibiotics or surgical intervention. Antibiotic choice is dependent on culture and sensitivity with a view to cure or suppress. This study aimed to review patients with diagnoses of chronic infections, their antibiotic choice and whether the risk of chronic antibiotics was documented.

Methods: This is a quantitative, descriptive, retrospective study of 10 patients. Data were collected from the infectious disease clinic on chart review and included age, diagnosis, organism and source, radiology used for diagnosis, CRP levels, incidence of C difficile, antibiotics used, presence of hardware and documented risk of antibiotics. Statistical analyses were performed using PASW 18.

Results: 70% of patients had chronic osteomyelitis, 30% had chronic prosthetic joint infections. Review of microbiology showed that 40% of patients had MRSA, 30% MSSA, 50% P. aeruginosa. ESBL and VRE were found in 10% each respectively. Anaerobes, coagulase negative staphlyococcus, Group B streptococcus and Group C Streptococcus were evident as well. Bone culture was used diagnostically in 20% of patients. Superficial or fluid swabs were used in the remaining cohort to guide antibiotic choice. Doxycycline was the most commonly prescribed drug (90%). 50% of patients had hardware in situ that was not for removal. 50% of cases had documentation regarding the risk of chronic antibiotic use. There was no prior history of C difficile in the patient cohort.

Conclusion: There are significant issues with antimicrobial resistance in patients on chronic suppressive and prophylactic antibiotics. Most antibiotic choice is governed by swab results currently. Further education and emphasis on the risks of antibiotic use is required.

ID10

Positive Impact of Repeated Antimicrobial Point Prevalence Surveys (PPS) in a Tertiary Irish Hospital

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Background: Annual hospital-wide antimicrobial PPS were conducted from 2011-2013 inclusive by an Antimicrobial Pharmacist and Consultant Microbiologist. Antimicrobial use prevalence and compliance with key indicators of quality prescribing was calculated, with more intensive prescriber feedback following the 2012 PPS, via detailed reports, grand rounds presentations and education sessions.

Methods: Key data collected on inpatients prescribed systemic antibacterials and antifungals included: prescribed antimicrobial, route, indication, documentation of indication and anticipated duration and compliance with hospital guidelines and/or discussion with clinical microbiology or infectious diseases (ID). Microsoft Excel was used for data entry and analysis.

Results: The annual number of patients surveyed was 624 (2011), 558 (2012) and 583 (2013). The annual antimicrobial use prevalence was 30% (2011), 37% (2012) and 36% (2013). Improvements were demonstrated between 2012 and 2013 with regard to proportion of intravenous antimicrobials: 72% to 60% and documentation of indication 77% to 90%. Documentation of anticipated duration remained below 30% across all three PPS. Compliance with hospital guidelines improved from 56% (2012) to 72% (2013) and the proportion of prescriptions on clinical microbiology/ ID advice increased from 29% (2011) to 41% (2013).Beta lactam-beta lactamase inhibitor combinations were the most commonly prescribed antimicrobials in each survey ranging from 33% to 37% of overall consumption. Although the proportion of patients prescribed surgical antimicrobial prophylaxis in each PPS was low (3-5%), the proportion exceeding 24 hours duration deteriorated annually from 57% (2011) to 84% (2012) to 89% (2013).

Conclusion: Following a more intensive programme of feedback after the 2012 PPS, improvements in quality indicators of prescribing were noted in 2013. Improving documentation of anticipated duration and reducing duration of surgical antimicrobial prophylaxis are key areas for improvement in 2014.

ID11

Severe complications of Acute Bacterial sinusitis in Children

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Background: Acute sinusitis is a relatively common condition in children and adolescents. Most cases are managed in the community and will resolve either spontaneously or with oral antibiotics. Complications are due to the proximity of the Para nasal sinuses to the orbit and brain and although rare are associated with significant morbidity.

Methods: Over a 4 month period in a regional paediatric unit there were 4 cases of complicated sinusitis. We conducted a review of these cases looking at initial presentation, evolution, management and outcomes.

Results: The age group was 6-14 years. Complications were Potts puffy tumour, subdural empyema, cerebral abscess and periorbital cellulitis. Headache was a preceding symptom in all cases and eye pain was a symptom in two out of the four cases. Duration of symptoms preceding presentation of complication ranged from 5 days to 8 weeks. Both cases with intracerebral extension presented with a focal seizure. All children were previously well with no underlying immunodeficiency. One child had had a previous presentation with headaches due to sinusitis. All cases required prolonged courses of Intravenous antibiotics, there was one ICU admission. 3 of the four cases had surgical intervention. An organism was isolated in only one of the cases and this was Streptococcus Constellatus isolated from a subdural collection. All cases were discharged home following a complete recovery.

Conclusion: We describe four cases presenting over a very short period of time that illustrate the range of potential severe complications of sinusitis in children and the importance of early imaging and Ear Nose and Throat specialist involvement in such cases.

ID12

Time-related Changes in the Bacterial Profile and Antimicrobial Resistant Strains in Burn Wounds in CUH

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Background: Wound infections are one of the most important and potentially serious complications that occur following burn injury. Previous studies have shown a change in the bacterial profile of burn wounds both across time for units as a whole and in burn wounds during the course of an inpatient hospital stay. The bacterial profile of burns swabs has not been assessed previously at Cork University Hospital (CUH), nor their change in time. This information is now understood to be important in order to help decrease burn wound infection.

Aims and Objectives: To identify the most prevalent strain of bacteria present in burn wounds, and how this has changed since 2006 in CUH. To look at the prevalence of antimicrobial resistant strains in the study population.

Methods: This retrospective study included patients admitted to the burn ward, 2D, in CUH, between January 1st 2006 and December 31st 2012. Swabs of each burn wounds checked for colonisation by resistant and non-resistant bacteria.

Results: Of 809 clinical samples taken from 329 patients admitted to ward 2D in CUH, pathogens were found in 507 samples (62.7%), in which 395 pathogens (77.9%) were Gram Positive Bacteria and 108 pathogens (21.3%) were Gram Negative Bacteria. The four most prevalent bacterial species isolated were Staphylococcus aureus (209, 25.8%), Coagulase-Negative Staphylococcus (102, 12.6%), Gram Negative Bacilli (54, 6.7%) and Pseudomonas aeruginosa (24, 3.0%). Antimicrobial resistance was found in 91 patients (27.7%), from which 126 clinical samples were taken.

Conclusion: In-depth knowledge of the bacteria causing infectious complications and of their antibiotic susceptibilities is a prerequisite for treating burn patients. High resistance to certain drugs was seen in these species, while drug sensitivity is significantly low in MRSA and Pseudomonas. The nature of microbial wound colonization, flora changes, and antimicrobial sensitivity profiles should be taken into consideration when using empirical antimicrobial therapy in burns patients.

ID13

An Overview of Lyme Borreliosis Testing in Cork University Hospital 2007-2012

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Background: The incidence of Lyme Borreliosis (LB) has steadily increased across Europe over the past decade. Diagnosis is confirmed by two-tier serological testing – ELISA and confirmatory IgM/IgG Western Immunoblot assays, the latter being performed at a borrelia reference lab. The overall aims were to describe the demography of those tested and diagnosed with LB between Cork University Hospital (CUH) and its reference laboratory (HPA, Southampton until 2011 and HPA Porton Down UK from 2012),with a calculation of the positive predictive value of the ELISA test when compared to the gold standard Western Immunoblot test for a single year.

Methods: A retrospective database review was conducted using testing information available through the Clinical Microbiology Department at CUH. All patients tested from 2007 to date were included and results were analysed using SPSS v.20.

Results: The number of tests increased from 685 (2007) to 1265 (2012), with the number of positive confirmed cases increasing from 34 (2007) to 82 (2012). The percentage of positive tests also increased from 4.96% (2007) to 7.34% (2012). In 2012 the majority of cases originated from rural areas. The same year, we noted the two-tiered testing method to have a positive predictive value of 79.16% for the testing modality. We demonstrated a drop in presentation for testing in the very young and the elderly with no gender correlation across years.

Conclusions: There has been a 2.5-fold increase in the incidence of LB between 2007 & 2013. Infection *with Borrelia Burgdorferi* is linked to exposure to tick bites with the positive test demographics indicating the risk of infection is highest in rural areas. The ELISA testing modality returned a 79.16% positive predictive value for the year 2012 when compared to the IgM/IgG Western Immunoblot assay.

ID14

Pulmonary hyperinfection syndrome with Strongyloides stercoralis in a patient with relapsing polychondritis.

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Introduction: Strongyloidiasis is caused by the intestinal nematode Strongyloides stercoralis. Fulminant infection can occur in the immunocomprised patient especially among those on glucocorticoid treatment.

Case report: We report a 40 year old man from Latvia with relapsing polychondritis who presented acutely with pulmonary hyperinfection syndrome. He had a severe form of relapsing polychondritis and was treated with an immunosuppressive regime including high dose steroids. He presented acutely with pyrexia of unknown origin, haemoptysis, abdominal pain and bloating. CT thorax demonstrated innumerable randomly distributed pulmonary micronodules. A granular heavily blood stained sputum sample was sent for cytology. This revealed multiple nematode particles consistent with Strongyloides stercoralis. (image 1-2)

Conclusion: This case describes pulmonary strongyloides infection in a significantly immunocompromised individual from an endemic area. Infection likely occurred through exposure when living in Eastern Europe years before. Strongyloides should be suspected in patients from high-risk areas with pulmonary and gastrointestinal signs, and radiographic evidence of pulmonary opacities with impaired cellular immunity. More consideration should be given to screening for Strongyloides in patients from endemic areas prior to commencing immunosuppressant therapy.

Ph1

A Retrospective Audit of the Bacterial Profile, and Antibiotic Treatment, of Traumatic Hand Injury Patients at Cork University Hospital

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Background: Traumatic hand injuries are common. Infected hand wounds are potentially devastating, resulting in significant morbidity and functional impairment. Appropriate antibiotic prophylaxis is important; however resistance is an increasing problem. Antibiotic use therefore, must be rational, specific, and appropriate.

Aims: To determine both the type and sensitivity of organisms present in the wounds of patients presenting with traumatic hand injuries; and, to determine whether antibiotic use for traumatic hand injuries is appropriate.

Methods: Charts of patients referred to the Soft Tissue Trauma Clinic, at Cork University Hospital, between 01/11/2012 and 31/12/2012 with traumatic hand injuries were retrospectively assessed. The charts of 60 patients were analysed to identify the type of antibiotic prescribed for their injury, which was then cross checked against their bacterial wound swab profile.

Results: 57/60 patients had wound swab data available. Of these, 93% (53/57) received empirical antibiotics during their hand injury treatment. Of the 54 patients who attended theatre, 92.6% (50/54) received perioperative antibiotics. Skin flora (29.8%), and no growth (29.8%), were the commonest wound swab results. *Staphylococcus aureus* alone was isolated in 15.8% (9/60) of cases, and in combination with Mixed Gram Negative Bacilli in 5.3% (3/60) of cases. The empirical choice of antibiotic, in those prescribed one, was appropriate in 94.3% (50/53) of patients. Only 5.7% (3/53) of patients were prescribed an antibiotic which did not cover the bacterial profile of their wounds.

Conclusion: The prescribed antibiotics largely matched patient bacterial profiles, providing cover for skin organisms and gram positive bacteria. In the majority of cases therefore, the choice of antibiotic was appropriate.

Ph2

An Audit of Surgical Antibiotic Prophylaxis in a Tertiary Teaching Hospital

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Introduction: Surgical antibiotic prophylaxis is important to prevent surgical site infection but overuse can lead to adverse effects and increased antibiotic resistance. The aim was to assess the adherence to surgical antibiotic prophylaxis guidelines and identify areas for improvements for the implementation of revised guidelines.

Methods: All patients undergoing surgery in the institution were reviewed for surgical antibiotic prophylaxis, over a week in August 2013. Type of surgery, antibiotic prophylaxis regimen and duration were noted. Results were compared to the local surgical antimicrobial prophylaxis guidelines.

Results: 122 patient charts were reviewed. 100 (82%) received antibiotic prophylaxis. Orthopaedic (26), general (23), plastic (18), neurosurgery (17) and breast surgery (14) were the predominant types of surgery performed. Antibiotics used for surgical prophylaxis were predominantly co-amoxiclav for general, breast and plastic surgery; cefuroxime for orthopaedic and neurosurgery; vancomcyin and gentamicin for cardiothoracic surgery. In 45% of patients who received antibiotic prophylaxis, a single dose prior to incision was given. In 25% antibiotics were continued for 24 hours post surgery. In the remaining 30% antibiotics were continued for between 2-10 days, generally to treat a presumed infection. Documentation of reason for continued antibiotics post operatively was poor. In 75% of cases, antibiotic prophylaxis was considered appropriate. In 7% of cases, it was considered inappropriate. In the remaining 18% it was difficult to ascertain appropriateness from the documentation. Issue identified in audit: prophylaxis not documented for four procedures where it should have been given; choice of agent in penicillin allergy; continuation of antibiotics for >24 hours post surgery and poor documentation of reason for continuation.

Conclusion: The majority of antibiotic prophylaxis complied with local guidelines. Areas identified for improvement in the revised guideline implementation process are ascertaining need and documenting for reason for continued antibiotics post surgery and choice of antibiotic in penicillin allergy.

Ph3

Therapeutic Dose Monitoring (TDM) of Nevirapine

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Background: Nevirapine is a Non–Nucleoside transcriptase inhibitors (NNRTI) which is used in combination with other anti-retrovirals (ARV) for the treatment of HIV-1 infected persons (1). Nevirapine tablets are a prolonged release formulation which should be swallowed whole and not crushed or chewed. During routine medication education by Pharmacists, two patients had discussed their concern at seeing tablet remnants in their stools. The SmPC for Viramune 400mg Prolonged Release tablets states that occasionally, the excipients of Viramune prolonged-release tablets will be eliminated in the faeces as soft, hydrated remnants.

HIV RNA viral loads (VL) are measured regularly to ensure ARV therapy remains effective in HIV patients (2, 3). The viral loads of the patients in question were examined for upward trends which could be a marker of treatment failure. Treatment failure can result from poor adherence, interactions and absorption issues. In addition Therapeutic Drug Monitoring (TDM) was performed to ensure all minimum effective concentrations were reached.

Aim/Objective: 1. To examine Patients Viral Loads 2. To perform TDM on patients (n=2) 3. To search literature for reports of treatment failure in these subset of patients

Methodology:
- Examination of VL and TDM levels.
- PubMed search of articles of Nevirapine virological failure and TDM

Results: TDM results showed that both patients were above the minimum acceptable levels (Ctrough 3000ng/ml) (4, 5). However, increases in VL were

observed, indicating a potential need for a change of Nevirapine

Conclusion: The cases were reviewed and a change in ARVs was deemed appropriate in one patient. TDM can be a useful tool in the management of HIV; however it should be used in conjunction with traditional methods of analysis and clinical presentation. TDM can be of benefit in establishing why treatment failure has occurred and aid therapy changes when needed.

Ph4

Report of Cfr Mediated Linezolid Resistance in Coagulase Negative Staphylococci in an University Hospital in Ireland

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Background: This is the first reported outbreak of cfr-mediated linezolid resistance in coagulase negative staphylococci (CNS) in Ireland. This report describes the details of this outbreak.

Methods: This study was set in a 350 bed teaching hospital with an eight bed intensive care unit. CNS sensitivity was monitored from 15th October 2010 to the 3rd of November 2012 following detection of a linezolid resistant CNS isolate. Cases were defined by the isolation of CNS with a linezolid Minimum Inhibitory Concentration (MIC) of greater than 8µg/ml.The clinical details of colonised patients and hospital wide linezolid consumption details were obtained. Linezolid susceptibility was evaluated using disc diffusion testing and the cfr gene was detected by Polymerase Chain Reaction (PCR) analysis.

Results: Linezolid resistant *s.epidermidis* were isolated from eight patients. None of the patients had been on the same ward at the same time. Seven of eight patients were admitted to the Intensive Care Unit (ICU) during their stay. All but one patient received Linezolid. All isolates carried the cfr antibiotic resistance gene and had an MIC of greater than 256 µg/ml.

The highest hospital wide use of linezolid occurred in the third quarter of 2010 (2.78 DDD/100BDU). The first two cases of linezolid resistant CNS was detected in the following quarter. Annual mean hospital wide use of linezolid was 1.90 DDD/100BDU and exceeded that of vancomycin.

Conclusions: This is the first report of cfr mediated linezolid resistance in *s.epidermidis* in Ireland. Clinical data indicates possible cross transmission of linezolid resistant *s.epidermidis* during the outbreak as it was isolated from a patient with no exposure to linezolid. The outbreak also occurred on a background of high hospital wide use of linezolid. Identification of the cfr gene highlights the potential for linezolid resistance to spread amongst other gram positive cocci.

Ph5

Misconceptions about Piperacillin/tazobactam usage: an audit of Piperacillin/tazobactam prescribing in medical admissions in two University hospitals in Cork, Ireland: a prospective observational cohort study.

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Background: Incorrect antibiotic management can lead to adverse clinical outcomes, increased healthcare costs and promote resistance to antimicrobials. This has led to the development of antimicrobial stewardship committees. Piperacillin/tazobactam is a broad spectrum antibiotic used in a variety of admissions. As such our main objective was to evaluate the prescription of Piperacillin/tazobactam in medical patients on admission to two teaching hospitals in Cork.

Methods: The study was conducted in Cork University Hospital (CUH) with approximately 659 beds and the Mercy University Hospital (MUH) with 262 beds. Lists of adult medical admissions, excluding day cases, for the previous 24 hours were obtained. We reviewed the available files and prescription charts of patients with respect to context and reason for admission and commencement of Piperacillin/tazobactam. Demographic data were collected. As data collection was carried out by two individuals a pilot study was conducted to ensure concordance on the method of

collection. The data collected were presented to an ID/antimicrobial stewardship physician, Microbiology/antimicrobial physician, and an Antimicrobial pharmacist. This involved a discussion of each admission with reference to the adult antimicrobial guidelines of each hospital. Data were analysed using Excel and Minitab.

Results: The observation period in CUH was from Sunday 12/01/14 to Thursday 16/01/14 inclusive. 132 medical admissions were identified. Data from 124 patients were analysed as data on eight were unobtainable. Of 65 male (52%) and 59 female (48%) patients eight received Piperacillin/tazobactam on admission (6.5%).

The observation period in MUH was from Sunday 23/02/14 to Thursday 27/02/14 inclusive. 69 medical admissions were identified. Data from 65 patients were analysed as data on four were unobtainable. Of 34 female (52%) and 31 male (48%) patients ten received Piperacillin/tazobactam on admission (15%)

Conclusion: Inappropriate Piperacillin/tazobactam prescription at time of admission of medical patients was not common in our cohort. Efforts being made by anti-microbial stewardship committees, such as those in CUH and MUH, through their ongoing roles in education, research and audit are helping to ensure adherence to guidelines which reduces unnecessary antibiotic usage.

Ph6

Microarray analysis of subcutaneous adipose tissue from healthy HIV-seronegative adults exposed to lopinavir/ritonavir exhibited significant changes in insulin signalling

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Background: HIV protease inhibitor (PI) therapy has been associated with adipose tissue toxicity. *In vitro* PI exposure in adipocytes is reported to result in decreased expression of key adipocyte transcription factors; peroxisome proliferator-activated receptor gamma *(PPARG)* and sterol regulatory element binding protein 1 *(SREBF1)*. However, these observations have not been validated in humans *in vivo* in the absence of HIV infection.

Methods: The Seronegatives and Metabolic Abnormalities 002 (SAMA002) study was a prospective, randomised trial in HIV-seronegative adults exposed to antiretroviral therapy for 6 weeks. In exploratory analyses using Affymetrix HG-U133 plus 2.0 microarrays we estimated whole transcriptome RNA expression in paired subcutaneous adipose tissue biopsies taken before and two weeks after lopinavir/ritonavir (LPV/r) 400mg/100mg BID monotherapy. Genes differentially expressed (DE) between baseline and week 2 samples (defined as ±30% fold change in expression, p ≤0.02) were identified using the Bioconductor LIMMA package and pathways affected were modelled using InnateDB. Results are median [IQR] unless otherwise specified.

Results: From four study subjects (75% male; age 34 [31, 40.3] years, BMI 22.5 [22.3, 23.2] kg/m^2), 131 DE genes were identified. No significant changes were detected in the expression of *PPARG*, *SREBF1* or in the expression of their downstream targets. However, pathway analysis revealed a significant overrepresentation in the insulin signalling pathway amongst DE genes (Table 1) with 9/131 (6.9%) associated with insulin signalling, 7 of which were up-regulated.

Conclusions: These data suggest effects on insulin signalling rather than inhibition of transcriptionally mediated lipid metabolism as the principal detectable molecular consequences of LPV/r exposure in HIV-seronegative healthy adults. This may reflect cellular responses to inhibition of the insulin-responsive glucose transporter GLUT-4 by LPV/r. These findings require validation in both *in vitro* models and larger clinical cohorts.

Table 1: Insulin signalling pathway DE genes (largest fold changes)

Gene Symbol	Gene Description	P value	Fold Change
PPP2R1B	protein phosphatase 2, regulatory subunit A, beta	0.018	+2.58
INSR	insulin receptor	0.013	+2.01
PDE3B	phosphodiesterase 3B, cGMP-inhibited	0.007	+2.00
LIPE	lipase, hormone-sensitive	0.012	+1.83
PRKAG2	protein kinase, AMP-activated, gamma 2 non-catalytic subunit	0.002	+1.72
IGF-2	Insulin like growth factor 2	0.003	+1.61

Ph7

Go Smart: Development of Regional Antimicrobial Guidelines for Smart Phones

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Introduction: At least one in three inpatients are prescribed antibiotics at any given time[1]. Guidelines for antibiotic use are an essential element of hospital antimicrobial stewardship programmes to ensure appropriate management of infection[2]. Guideline development and roll out can be an onerous task for an individual or even for an institution. Accessibility of guidelines is important to ensure they are utilised and adhered to. The aim was to update antimicrobial guidelines for Cork and Kerry Acute Hospitals and develop a novel electronic application (app) of the guidelines for download onto smart phones.

Method: The Cork Kerry Regional Antimicrobial Stewardship Committee revised their antimicrobial guidelines between January and July 2013. These were published in August 2013. Development of the app was conducted in-house by an ED Consultant with a special interest in app development. Content is verified by the antimicrobial pharmacists.

Results: Peer reviewed evidence-based antimicrobial guidelines for use across Cork and Kerry have been published. Each individual hospital within the region can adapt the guidelines locally to their requirements and must gain endorsement from their governance structures for use within their institution. The guidelines have also been produced in an electronic app that is easily accessible on smart phones or via the internet.

Conclusion: With good teamwork it is possible to reduce the burden of guideline development for a number of institutions concurrently. The accessibility of the guidelines on a smart phone app will promote their utilisation across the Cork Kerry Region.

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