

Tackling
Transmission
of Healthcare-
Associated
Infections

2010



**Report from the Office of
The Lord Harris
of Haringey**



Review Session

‘What Have We Achieved and What’s Around the corner?’

Chaired by Lord Toby Harris and Dr Brian Iddon MP

and

Presentation of

‘Calls for Further Action’ by Patient Groups

Hosted by Lord Toby Harris

The House of Lords, 9th March 2010

Content

Participants in the events	Page 4
Review Session ‘What Have We Achieved and What’s Around the Corner?’	Page 6
Chaired by Lord Toby Harris and Dr Brian Iddon MP	
Welcome and Opening Remarks	Lord Toby Harris and Dr Brian Iddon MP Page 6
The Challenges and Potential Solutions for Infection Prevention and Control	Dr David Jenkins Page 7 Consultant Medical Microbiologist and Lead Infection Control Doctor, University Hospitals of Leicester NHS Trust
Healthcare-Associated Infections: Beyond MRSA and C. difficile. (Discussion session 1)	Dr Eleri Davies Page 11 Director Welsh Healthcare Associated Infection Programme Team (WHAIP), Public Health Wales
Healthcare-Associated Infections: The Technology Innovation Programme. (Discussion session 2)	Sandra Barrow Page 20 Operational Workstream Lead, Healthcare-Associated Infection Technology Programme, Department of Health
Treatment and Prevention of Healthcare-Associated Infections: A perspective from the Pharmaceutical Industry	Dr E. David McIntosh Page 27 Global Scientific Affairs Senior Expert, Novartis Vaccines and Diagnostics; Honorary Clinical Senior Lecturer, Imperial College, London
The Challenges for New Anti-Microbial Medicines: A Lesson from History. (Discussion session 3)	Dr John Porter Page 30 Head of Speciality Medicine, Pfizer
Concluding remarks	Lord Toby Harris Page 39
Presentation of ‘Calls for Further Action’ by Patient Groups	
Hosted by Lord Toby Harris	
Lord Toby Harris	Page 40
Janice Stevens CBE	Page 40
National Director, Healthcare-Associated Infections and Cleanliness, and Delivering Same-Sex Accommodation, Department of Health	
Graham Tanner	Page 41
Chair, National Concern for Healthcare Infection; on behalf of patient organisations	
Fiona Loud	Page 42
Chair, Kidney Alliance; on behalf of patient organisations	
Appendices	
Appendix 1: Speaker biographies	Page 45
Appendix 2: References	Page 48

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Lord Toby Harris	House of Lords
Baroness Masham of Ilton	House of Lords
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Review Session

What Have We Achieved and What's Around the Corner?

Chaired by Lord Harris of Haringey and Dr Brian Iddon MP

Welcome and Opening Remarks

Lord Harris of Haringey

This review session, is entitled: "What we've achieved, and what's around the corner?" We all know, and everyone in this room is clear that tackling healthcare-acquired infections is a huge and complex policy area of vital importance. It is a top Government priority and I am conscious of the progress that has been made, although plenty more still needs to be done. It has certainly been a topic that has frequently been raised on the floor of the House of Lords. It is equally of interest in the House of Commons, and it is, of course, of major concern to very many people, including many of the organisations represented in this room.

The intention is that this meeting is an opportunity for us to become further informed on the issues, especially on emerging pathogens and the steps being taken to safeguard all of our well-being. We have an extremely wide-ranging audience: Baroness Masham of Ilton, one of our parliamentary colleagues; representatives of the voluntary sector and involved service users; researchers and legal experts; NHS professionals; and policy-makers from the Department of Health, including Janice Stevens, the National Director of the Healthcare-Associated Infections Programme, who will be joining us later.

I am also delighted that Dr Brian Iddon MP from the House of Commons is here. He is going to help me chair the session and I will ask him to introduce the speakers.

Dr Brian Iddon MP

Thanks Toby for inviting me back to what is the third meeting of its kind on this topic here at Westminster, one which is extremely important to clinicians and patients alike who are dealing with the National Health Service. I was struck in previous meetings, listening to people from different clinical disciplines, how careful some clinicians had to be to avoid healthcare-associated infections. Of course it is important to be careful throughout, but in some areas where invasive techniques are being used and wherever catheters are being fitted to patients, such as in dialysis, it is extremely important to very careful.

At the last meeting, we looked at numerous disciplines and different therapy areas. A number of key themes emerged. Some were pretty obvious and some possibly less obvious. Patients who have had difficult experiences with the National Health Service, and indeed some of the clinicians, came up with some themes we had not thought about, which were not topmost in our minds before we began. Indeed, some fresh ideas came about.

These three meetings have been extremely important. We record all these sessions, so the work that is done here this afternoon will be widely distributed to the Health Committee in the Commons, the Health Select Committee and to individual members of it, and also to key officials in the Department of Health, as the reports on the previous two sessions have been. So please feel that what you are doing this afternoon is important and it will get to some important people.

At the last meeting we examined what we have called the TEAM Approach: "Together Everyone Achieves More," patients and clinicians alike. We focused on four key themes; firstly, that wide-ranging education is important, particularly for those coming into the National Health Service for the first time. It is equally important that patients have an education as well as clinicians. The second theme was that engaged patients are partners in their own healthcare strategy, in their own healthcare safety; it is important that they realize that. The third theme was disease-specific awareness being a top priority and that patient groups have a major role to play in this. I know there are members of patient groups here this afternoon. The fourth key point we came up with is that we must maintain progress, particularly on reducing MRSA and *C. difficile* while extending action against other and emerging pathogens. These are not the only two organisms that we need to keep an eye on because as you knock one organism out in this world other organisms are just waiting to take over. This is an ongoing area that needs a lot of research and a great deal of observation from clinicians in all our clinical settings.

That is the background to this meeting: education, engagement and a role that we all have to play, whether clinicians or patients alike. I am pleased now to introduce our first speaker to set the scene. Dr Jenkins has contributed actively to previous events.

The Challenges and Potential Solutions for Infection Prevention and Control.

Presentation by Dr David Jenkins

Consultant Medical Microbiologist and Lead Infection Control Doctor, University Hospitals of Leicester NHS Trust.

Ladies and gentlemen, we are here because we are concerned about healthcare-associated infections, which is the right state of mind to be in. We should be concerned.

First, they are very common: their prevalence was around about eight per cent in a study in 2006. I would like to point out that they are common in the United Kingdom, but actually they are common all around the world. They appear to be an inherent part of all healthcare, which is an issue we need to think about and challenge. The United Kingdom is certainly no worse than many other countries and we do not need to be ashamed about our record on healthcare-related infections. In many regards we have done a great deal in the past decade or so, and we are now leading the way globally in infection control in many ways.

Nevertheless, infections still cause a lot of problems to a lot of people; ranging from trivial infections to life-threatening disease, and they also cost a lot of money to healthcare organisations. It is difficult to obtain good numbers on this, but a reasonable estimate on bloodstream infection is about six thousand pounds per

infection; and there are significant operational costs as well, for example resulting from patients staying in hospital for longer.

There are a number of significant features about healthcare-associated infections which make them completely undesirable to everybody; that is an important point to make. No-one wins from healthcare-associated infections. Once we realise that, and all of us accept it, that is an important step forward in joining together in a co-operative and effective manner to reduce healthcare-associated infections. Bear that in mind please: no-one wins from healthcare-associated infections; we all lose.

I want to introduce a framework which I find helpful when considering healthcare-related infections: the “four Ps”: **p**athogens, **p**atients, **p**lace and **p**ractice, as illustrated in *Figure 1*. Clearly, to catch an infection you need both a **p**athogen and a **p**atient to come together. Healthcare infections normally take **p**lace in some kind of setting, whether it is in a hospital or a community setting, and how the healthcare is caught is the **p**ractice.

The 4 Ps of infection prevention and control

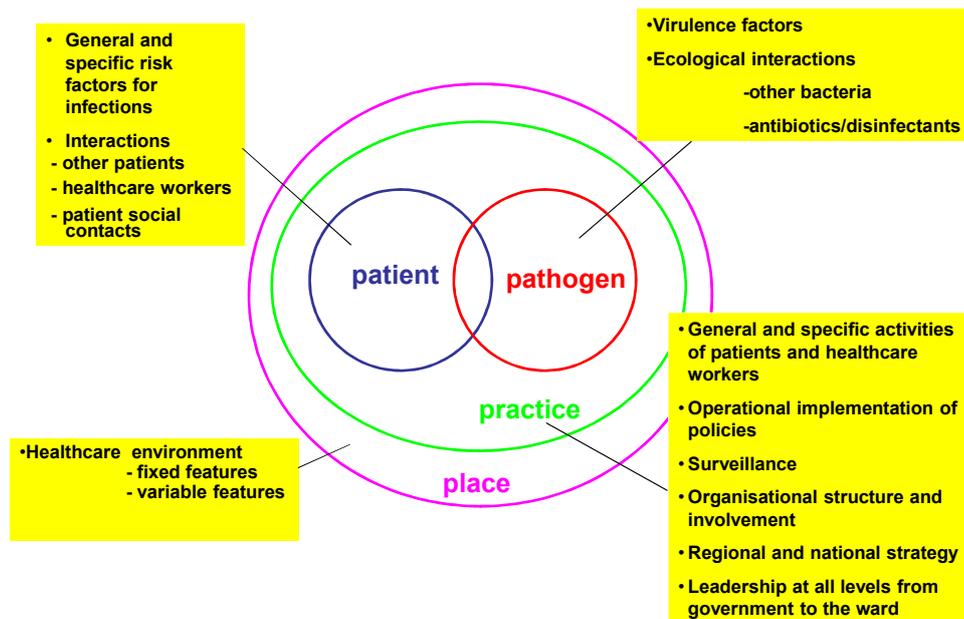


Figure 1: The “Four 4 Ps” of infection prevention and control

I want to use this framework to reflect on the successes of the last few years in this country in reducing healthcare-associated infections. Dr Iddon has heard me talk before and praise Dr John Reid in the past. I still think that he is an immense figure in infection control because in 2004 he set the first real objective to reduce healthcare-associated infections in England; and that was to reduce the number of MRSA bloodstream infections by half by 2008. We in infection control, I think I speak generally, found that an almost impossible target to contemplate at the time, but nevertheless we achieved it, which was a remarkable achievement against a **p**athogen.

The target against MRSA was followed by a target for reducing *C. difficile*. Once again, when our minds were set to it we reduced *C. difficile* remarkably quickly. We have certainly surpassed the initial target of a thirty per cent reduction in three years; we achieved that in one year. Now the Department of Health is looking at ways of reducing *C. difficile* further.

One of the major advances with patients is that now at least some of them feel able to challenge doctors and nurses by asking, "Have you washed your hands?" We should develop that seed further.

There have been some useful advances in the place: new builds have taken place, and almost invariably they have increased the proportion of beds in single rooms, which is an important element in reducing infections.

There have also been some remarkable and impressive improvements in cleaning practice, and again we should celebrate that. But probably, one of the most important elements is the change in hand hygiene practice. A decade or so ago, very few people were concerned about hand hygiene; now it is well-ingrained in medical practice, both because of the introduction of alcohol hand gel and, more recently, the introduction of bare-below-the-elbow as a policy. That represents the beginning of a change in mindset in practice and is something that we need to mark well and develop further.

Also involved in bringing down the rates of MRSA bloodstream infections was the necessity to include and engage senior management. Many Trust infection control practitioners have recognized this as an important element in bringing infections down.

Finally, there has been the introduction of regulatory codes of practice as a result of the Health and Social Care Act. This is an impressive document that I would recommend to everyone because it is meant for patients as well as for managers and healthcare practitioners.

Nevertheless there are some important challenges ahead. I return to my "four Ps": pathogens. First of all, 2010 marks two hundred and one years since the birth of Darwin and anyone who doubts evolution should just look at how bacteria respond to antibiotics! We know that as antibiotics are used bacteria will respond and evolve resistance, so we can take for granted that resistant bacteria will become more and more present.

It is not just resistant bacteria; most healthcare-associated infections are caused by very sensitive bacteria - but still they cause problems. If we ask someone with a *Staphylococcus aureus* bloodstream infection whether they mind that it is not MRSA, clearly they do not care at all; the problem is that they have an infection. The important thing is that we need to recognize the need to prevent all infections, not just infections with resistant organisms. So I would like to make a plea for concentration on antibiotic-sensitive organisms, as well as the multi-drug resistant organisms that we all hear about.

Another challenge is that patients are going to change over the next decade. In-patients will tend to be older, frailer or have multiple co-morbidities. They are going to be ill for a number of reasons, and this means that their risk of healthcare-associated infections is going to increase, and that is an increasing challenge.

Over the next few years there will be a challenge in the "P" for place; there may be bed closures over the next five years, and this may mean ward closures. That implies that patients may be mixed together. One

of the successes in the last few years has been the concept of ring-fencing, for example elective orthopaedic patients being nursed only in wards where elective orthopaedic patients are nursed; with no medical or other general surgery patients being introduced into that ward. As a consequence, orthopaedic surgery-site infections have reduced. The danger with ward closures is that we may end up foregoing that ring-fencing, mixing all sorts of specialties together and potentially increasing the risks faced by low-risk infection patients by exposing them to high-risk infection patients. There will also probably be a decreased rate of new-build hospitals and potentially new refurbishment as well. Unfortunately, I suspect that this is going to slow down the increase in single-patient rooms, which we need to be concerned about.

The final “P” is for **p**ractice and the big concern here is complacency. In a sense, we are in danger of being victims of our own successes. People who do not know about infection control, or who do not know about healthcare-associated infections, believe that MRSA and *C. difficile* are the entirety of it. Once they see the numbers have come down they will think that the job is done and let people involved in infection control move on to other things; maybe to other management options, such as finance, or to other clinical specialities. I am not an advocate for anything else apart from infection control, and that is what I am responsible for. Although I recognise that, for example, deep vein thrombosis is a significant risk, I do not want people’s attention to move on to that at the cost of infection control, so let us keep infection control on the agenda.

There were some interesting lessons to learn from the recent Francis report into the Mid-Staffordshire Health Authority, where senior management were more focused on finance than healthcare. We should remember that the number one priority for hospitals is to provide help for patients. Everything should flow from that; so let us make sure that best practice is on the agenda all the time.

There is also some concern in the lack of consistency in practice. Although MRSA rates have come down overall, in some Trusts remarkably so, in other Trusts they have hardly changed or maybe even increased. That lack of homogeneity among hospitals needs further inquiry. We need to make sure that the worst Trusts become as good as the best Trusts, and the best Trusts become even better.

I do not like bringing challenges and problems without also bringing solutions, so the final step now is some potential solutions. In “**p**athogens” the watchword is vigilance. We need to make sure we keep looking at MRSA and *C. difficile* but we also need to include in our horizon-scanning both sensitive and multi-drug resistant organisms, and that means surveillance. I am extremely pleased to see that surveillance is now part of the Health Code of Practice and we are expected to do that. It may have been overlooked by a number of Trusts but I suspect that they will find out sooner or later that they will now have to carry out surveillance of surgical-site infections, which is a big step forward.

When it comes to **p**atients, we need to carry on with engagement in sessions like this one. We all need to be involved. Let us challenge Trust Boards to produce good data on infections, so that we all know what is happening in our local Trusts. When it comes to **p**lace, we need to make sure that future designs of hospitals enforce best **p**ractice. We need to make sure that there are a lot of single rooms, lots of toilets and lots of hand washbasins. We also need to make sure that the furnishings in these places are well designed for infection control purposes. A project called “Design Bugs Out” which has produced some wonderful prototypes.

Practice needs to change. The most important issue is that we need to complete the change of mindset. I talked earlier about how senior management are now being involved. We need to make sure that that is well embedded in all sorts of professional practice in hospitals. We should all think it astonishing that healthcare-associated infections exist. They should not be a natural part of healthcare delivery. We should ensure that this is taught right from the very beginning in nursing school, in medical school, and senior managers should also appreciate that point in their training.

Finally, an element of what I call “creative inspection”. The Care Quality Commission is now taking responsibility for the Code of Practice. I hope that it is not going to be a “dead hand of inspection.” I hope that it will encourage best practice, that it will motivate Trusts to learn from each other and that they will encourage the best Trusts to co-operate with struggling Trusts to improve everybody’s practice. I hope then it will introduce evidence-based, scientific infection control measures with scientific rigour.

Dr Brian Iddon MP

I will take the first two speakers on clinical aspects of the subject first and then we will have a question time. Our next speaker, Dr Eleri Davies, brings experience from Public Health, Wales.

Healthcare-Associated Infections: Beyond MRSA and *C. difficile*. Presentation by Dr Eleri Davies

Director, Welsh Healthcare Associated Infection Programme Team (WHAIP), Health Protection Division, Public Health Wales NHS Trust.

I concur with much that Dr David Jenkins said in terms of the successes that have already been seen but also the need to keep the focus on infection control for the future. With devolution, some differences have developed in the NHS in Wales *versus* the NHS in England, Scotland and Northern Ireland. However, on infection control the aim is the same across the UK in that reducing healthcare-associated infections is a key aim and high on the agenda across all the devolved nations. I want to look at the broad issue of healthcare-associated infections and look at healthcare-associated infections beyond MRSA and *C. difficile*.

Clearly, MRSA and *C. difficile* carry a huge burden. In Wales we have seen a peak in our *C. difficile* rate a little after the peak in England, and are currently working hard to deliver reductions in *C. difficile*. If we look at the definition of healthcare-associated infections, we are today talking about healthcare-associated infections in a wider sense. Any infection that is associated with the delivery of healthcare, wherever that healthcare is being delivered, should be considered to be a healthcare-associated infection. Whereas there has been a lot of focus on MRSA and *C. difficile*, for those who suffer surgical-site infections, central line-related infections and unnecessary urinary tract infections, the morbidity and mortality suffered by those individuals are just as great as if it was an MRSA bacteraemia or a *C. difficile* infection. We must see the broader nature of associated healthcare-related infection.

Once MRSA and *C. difficile* are reduced, we cannot then just say, “Oh well, we’ve sorted it”, and move on because there is a huge disease burden associated with healthcare-associated infections that is not due to MRSA and *C. difficile*. David mentioned the evolution of organisms; if we look at the history of infections over time, for example what has happened in the course of the life of the NHS, then you can see that as soon as each antibiotic is put onto the market resistance results. Infection control teams were first set up in the 1950s in response to hospital outbreaks related to penicillin-resistant *Staphylococcus aureus*. Penicillin became widely available after the war and almost as soon as it was available, resistance developed. As we have moved through the years, we have handled *C. difficile*, vancomycin-resistant *enterococci* and are now dealing with the consequences of swine flu, and so on. *Figure 2* illustrates the range of healthcare-associated infections in the NHS between 1980 and the present. All of these have challenged us in terms of managing healthcare-associated infection within our hospitals and communities. It is an evolution and we must ensure that we are continually horizon-scanning for future resistant organisms and the future organisms that are finding new niches in our healthcare system.

HCAI in the NHS 1980 - 2010

- HIV (1983)
- Hepatitis C (1989)
- Vancomycin Resistant Enterococci (1989)
- *Staphylococcus aureus*
 - EMRSA 1 (1981)
 - EMRSA 2 – 14 identified 1980s
 - EMRSA 15 & 16 (1990s)
 - EMRSA 17 (2000s)
- Extended spectrum β lactamase producing GNRs (1990s)
- MDRTB (1990s)
- vCJD (1996)
- SARS (2000s)
- Avian influenza (2000s)
- *Clostridium difficile* (2008)
- *Staphylococcus aureus* PVL positive (2008)
- Pandemic Influenza (2009, the year of “swine flu” H1N1v)



Figure 2. Healthcare-associated infections in the NHS in recent years

Currently, in Wales we are undergoing a massive reorganisation of the NHS and are developing Health Boards instead of our former Trusts and Local Health Boards, which brings the secondary and primary care activity together under one organisation. This is bringing challenges in assessing how to manage healthcare-associated infection across those boundaries, within these large new organisations.

It is apparent that a lot of what we know about healthcare-associated infection is hospital-based but that there is a great deal to know about what is happening in the community in relation to discharging patients earlier and presentation of healthcare-associated infection in the community. One of our current big

challenges is to ensure that the new structure of NHS Wales takes on board the whole picture of healthcare-associated infections.

I was involved with the organisation and data collection for the prevalence survey of 2006 (*Figure 3*) in Wales. This was a UK-wide prevalence survey, although Scotland did things slightly differently and carried out a year-long study. Over the period of 2005-6, all the nations of the UK chose to look at the whole burden of healthcare-associated infection, not just at MRSA and *C. difficile*. The 2006 survey was the largest of the three national prevalence surveys that have been conducted in the UK. Over 75,000 adult in-patients were surveyed in the course of the surveillance programme in England, Wales, Northern Ireland and the Republic of Ireland. I did some of the work of benchmarking some of the hospitals in Wales against what the practitioners within each hospital were doing. It is illuminating when you look at patients' notes and understand some of the histories behind the figures, and understand how difficult some people's treatments have been because of the consequences of healthcare-associated infections.

Prevalence Surveys

	Year	Location	Number of hospitals	Number of patients	Increase in patients surveyed	Prevalence Rate
First National Prevalence Survey ¹	1980	England & Wales	43	18,186	-	9.2%
Second National Prevalence Survey ²	1993-94	UK & Ireland	157	37,111	104%	9.0%
Third National Prevalence Survey	2006	UK & Ireland*	273	75,671	316%	7.6%

*Excluding Scotland and Jersey

¹Meers *et al.* 1980

²Emmerson *et al.* 1996



Figure 3. Prevalence surveys of healthcare-associated infections

That apart, it was useful to see the range of healthcare-associated infection that we were identifying in the course of that survey. If we look at the data on the actual burden of disease; over the three national prevalence surveys, the burden of disease is about nine per cent. The most recent survey has a rate of seven point six per cent or close to eight per cent; this is a little lower than the first two but please bear in mind that the definitions used are slightly different so they are not necessarily directly comparable. Over the time period, we're seeing a burden of healthcare-associated infection which is about the same across the UK.

If we look at the healthcare-associated infections identified in this survey, top of the list was gastrointestinal infections, which includes *C. difficile* (Figure 4). Urinary tract infections were a close second, followed by surgical-site infections, pneumonias, skin and soft tissue and primary bloodstream infections. These are not organisms, but disease states or systems that are affected by healthcare-associated infection.

Common HCAs

- Gastro-intestinal infections 20.6%
- Urinary Tract Infection 19.9%
- Surgical Site Infection 14.5%
- Pneumonia 14.1%
- Skin and Soft Tissue 10.4%
- Primary Blood stream 7%



Figure 4. Common healthcare-associated infections

The survey was set up to look specifically at the prevalence of MRSA and *C. difficile*. When we looked at the total number of patients surveyed, about one per cent was found to have MRSA and just over one per cent had *C. difficile*. I do not wish to say that to diminish in any way the significance of MRSA and *C. difficile*, but to put these in context. We have a number of other organisms causing healthcare-associated infections and a number of other systems that are affected by healthcare-associated infections. If we look at the overall numbers of healthcare-associated infections, then MRSA accounted for almost sixteen per cent of the infections; so it is certainly significant. The prevalence surveys give you the overall burden of disease and there is a perception that healthcare-associated infections are increasing, even though perhaps the prevalence survey data suggests that it is about the same over a period of time.

It is worth considering for the future that, as time has gone by, we have increased the aggressiveness of our therapies for patients; we have increased our ability to treat patients. If you look at five year survival rates for cancers they have improved markedly, but to do that we are giving people aggressive chemotherapy. We are putting lots of devices, central lines and urinary catheters into people to manage them. That increases the risks of healthcare-associated infection. Also, the increased throughput of patients we are seeing and the risks of bed closures do increase the risk of infection.

In the first years of the NHS we had very few antibiotics available. If you look at the British National Formulary now you will see over two hundred and fifty different types of antimicrobials. The risks of overuse of antimicrobials are not only resistance but also *C. difficile*. For the future, we need to bear in mind that we are doing well in terms of improving patient care and treating more and more patients, but our treatments do have consequences of increased risk of healthcare-associated infections. What came out of the prevalence survey quite clearly was that a number of the secondary infections such as urinary tract infections and bloodstream infections are device-related infections, and clearly related to what we are doing to patients in terms of their treatment.

What are the solutions? A vast amount of effort and resource has gone into reducing MRSA and *C. difficile* and that is to be applauded. Some actions, however, have been specific to these infections and possibly do not address the wider issues of other healthcare-associated infections. We can focus too much on some specific organisms rather than looking at the whole system of improving the quality of patient care to reduce healthcare-associated infections.

Clearly, hand washing is one of our key interventions. The “Clean Your Hands” campaign from the National Patient Safety Agency has worked well across the UK to improve the profile of the need for hand hygiene. This has been accompanied by patient engagement in the “It’s OK to Ask” part of the programme.

I am keen on moving towards the incorporation of Care Bundles and quality improvement methodologies into our future management of healthcare-associated infection. Consistent processes need to be in place that we can use each time for each patient in order to deliver better care and reduce the risks of infection. For those of you who are not familiar with Care Bundles, they are groupings of best practices that individually improve care but when applied together result in substantially greater improvement. We need the consistent application of care to minimize the risks of healthcare-associated infection.

Across the UK there are patient safety campaigns in place, which are based on the excellent work of the Institute for Healthcare Improvement in Boston. In England it is called Patient Safety First, in Scotland it is called Patient Safety Alliance and in Northern Ireland the Safety Forum. In Wales we went for the 1000 Lives campaign and we are due to save a thousand lives and prevent fifty thousand episodes of harm by April 2010. We are hopefully going to reach that target in the next month or so.

An important part of the work of 1000 Lives campaign was a content area devoted to reducing healthcare-associated infection. We were focusing on: hand hygiene; the introduction of Care Bundles for ventilator-associated pneumonia and central line infections; the introduction of Care Bundles for urinary catheter work; and improving general equipment care. Numerous tools were made available through that campaign for people to improve consistency of care.

Another key part of these campaigns is patient engagement. The work has been very much to learn from patient experiences using patient stories and patient engagement in the development of the campaigns to improve communication issues and to learn more about healthcare-associated infections.

I wanted to highlight work on critical care infections in particular; this work was in hand in Wales before the 1000 Lives campaign started in 2008. But there had been recognition in Wales that critical care has a high risk of infection and it was decided that there would be an introduction of Care Bundles to prevent

ventilator-associated pneumonia and Central Line Maintenance Bundles across all the critical care units in Wales, from 2006. This went well, with considerable excellent engagement with the anaesthetists across Wales.

The Welsh Assembly Government also supported a surveillance programme to look at central line infections and ventilator-associated pneumonias, so that we had an arrangement whereby interventions were put in place underpinned with outcome measures to be clear as to whether or not the interventions were making a difference. Hence, we have been undertaking surveillance of these infections since 2007-8, and the Central Line Maintenance Bundle has been in place across the critical care units since 2006, closely followed by the Ventilator-Associated Pneumonia Bundles.

Figure 5 illustrates the data for the first year of our surveillance programme. The number of infections that we are now seeing are small.

HELICS defined CVC infection rate by month for All Wales for the period 01/09/2007 - 31/12/2008

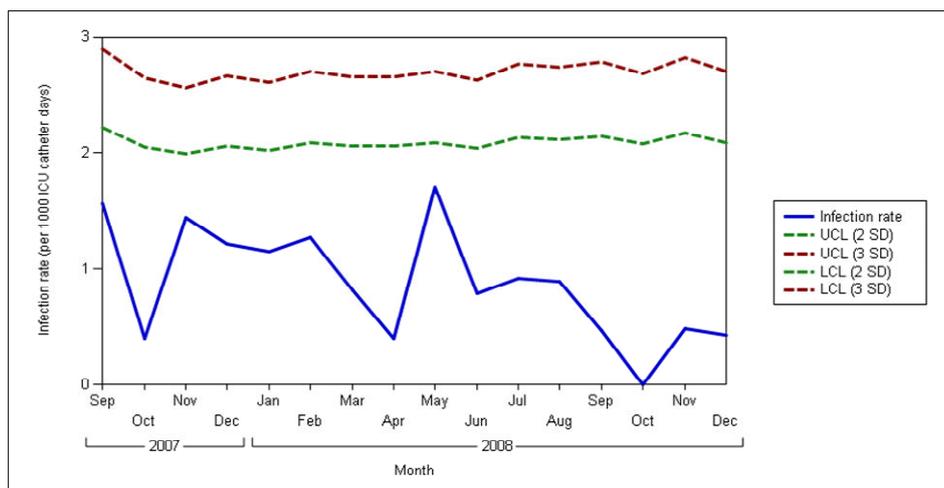


Figure 5. Central Venous Catheter infection rate, defined by the Hospital in Europe Link for Infection Control System (HELICS)

Whenever we are engaging in surveillance we have to understand that to compare data across any ranges of organisations we have to have standard definitions. Therefore, we have chosen to use European definitions, from the Hospital in Europe Link for Infection Control System (HELICS) which has now been taken over by the European Centre for Disease Prevention and Control, so they are a standard set of definitions. They exclude some infections because they are a strict definition. In addition to the infections that comply with the HELICS definitions, we also report back to the units any infections that they report as possible infections, so that we can facilitate improvement work. The key message is here that there is good evidence now in Wales

that if we introduce Care Bundles to improve the quality of care it is also important to study the underpinning surveillance data to confirm outcomes and demonstrate that there is improvement and monitor that over time. Then if we see a blip in the infection rates going up, we can address that by going back to the units and looking to see whether there has been a breakdown of procedure. Hence the Care Bundle approach brings us to a situation where we can deal with the wider issues of healthcare-associated infection and focus on interventions that we can put in place consistently for every patient. These interventions will protect patients from any type of infection affecting a certain type of care or delivery of care. This approach can also be applied to the insertion of urinary catheters, or the insertion of peripheral lines. The challenges are to use these Care Bundles effectively and to ensure that every patient gets the highest standard of care to reduce the incidence of infection.

My key challenges currently are to embed this work on healthcare-associated infection for the future and to keep the focus of the new NHS in Wales on healthcare-associated infections so that, as we hopefully continue to reduce MRSA and *C. difficile*, we do not lose the will to address all the other healthcare-associated infections that must also be addressed.

Discussion session 1

Dr Brian Iddon

This week we are highlighting circulatory diseases across the country. I attended an event this morning by the Circulation Foundation. We are particularly trying to highlight how we can save amputations by clinicians working together, a topic that arose in a previous meeting on the subject of healthcare-associated infections and people with diabetes. There are far too many amputations of lower limbs especially in diabetic patients. Hospitals such as those in Middlesbrough, Southampton and particularly in Ipswich have shown how they can dramatically get the number of amputations down. Peripheral arterial disease and claudication of the arteries can lead to ulcers and gangrene, and eventually amputation. Over to the floor now as this is an interactive session.

Derek Butler

Chair MRSA Action

Both speakers gave excellent presentations, and both touched on common themes: the "Clean Your Hands" campaign, hygiene with "Bare Below the Elbows", and the use of antimicrobials. I still have some reservations with regard to how far we can go. The reason is that we cannot get the basics right. I have been spent the past three weeks in a hospital visiting a relative and have noticed staff, nurses and doctors, who were not completely bare below the elbows. They have no watches on and their shirts finish at the elbows - but they wear rings. I have reservations with that because rings are areas for bacteria to stick to, no matter how smooth they are. I am an engineer and I know that you cannot get a piece of metal perfectly smooth and things can stick to it. Microbes can be two to three microns and they stick to metal, because it's not smooth.

My other reservation is the fact that we seem to be very hooked on using antimicrobials. Microbes are good at being able to control the environment they live in. Yet we have a chance to change the

environment they live in. If we do not use the antimicrobials they will not build up the resistance. I think avoiding infections first is the first primary call of any clinician, or any person.

Dr David Jenkins

I agree entirely. I am glad that staff are bare below the elbow and also that you have noticed that. I think that this is a significant change. I am not sure that the policy has been fully implemented everywhere and is fully adhered to everywhere. That is still a challenge. There are a number of issues remaining. Rings, such as wedding rings, engagement rings, and other bits of jewellery are seen frequently. There is some cultural difficulty in removing wedding rings at least. In our Trust we allow wedding rings as long as they are plain metal bands, but I accept your point that, nevertheless, these can still harbour bacteria. There is still some discussion to be had on that issue. I support what you are saying, but I need to make sure that I take people with me rather than alienate them altogether.

If we do not use antibiotics we will not develop resistance; even antibiotics that are prescribed appropriately can lead to the development of resistance, so any antibiotic usage is a pressure for the evolution of resistance. We have to make absolutely sure that any antibiotic that is prescribed is prescribed appropriately. That is easy to say; it is much more difficult to define what we mean by “appropriately”, and we need a lot more work to ensure that we all know what optimal treatment is. I have a personal campaign in the sense that I would prefer anybody who prescribes antibiotics to have a degree of knowledge and qualification which is over and above a basic medical degree. Antibiotics are a unique class of drug; no other class of drug affects the health of other people apart from the patients who are being prescribed that drug. If I prescribe an antibiotic badly for one patient and they end up with an infection that is resistant, that organism can transfer to other patients and can affect their health and their chances of recovery. That is a unique consideration and something we need to address carefully. I agree entirely with you; we need to work much harder. There is a lot of work left to do.

Dr Eleri Davies

I am not sure that I can add much on the hand hygiene issue, other than to agree that there has been a culture change with “Bare Below the Elbows”, particularly in England because the policy did not apply in quite the same way to Wales. However, we are doing the same types of things. Rings are an issue and it is often difficult to roll out these policies.

There is work that needs doing on antimicrobials. We are considering standardizing approaches to support people in their prescribing. Prescribers, who are generally the medics, feel quite strongly that they are able to do this well. They sometimes need some support to ensure that the barriers to prevent overuse of antibiotics are in place. We are actively considering the implementation of a number of measures, such as: seven day rules, switching policies; use of clear stickers to document why an antibiotic has been used; consultant consideration of those prescriptions at forty-eight hours to try and improve the use of antimicrobials. Clearly, we cannot just ban their use. They are useful drugs, but there are ways of trying to improve exactly how they are being used and to focus the way that they are being used.

Dr Brian Iddon

I would like to point out too that that we get some of our resistance to antimicrobials from factory farming. Tonnes of antibiotics go to allow cattle and other animals to be fattened without acquiring infections. In fact, they do the opposite to putting on weight, they knock weight off the animals. We must also campaign against overuse of antibacterials in the factory farming industry.

Derek Butler

Just as a final comment; doctors often use antibiotics as a first resort instead of a last resort, and that is the difference between good prescribing and bad.

Maria Cann

MRSA Action

My comment is on the relationship between antibiotics and swine flu and the Department of Health guidance. The Department of Health recommended the use of antibiotics empirically and relatively easily for the treatment of flu or flu-like illnesses in the recent flu epidemic, and there was concern that this may lead to increased resistance and also adverse effects, such as Clostridium difficile.

Dr David Jenkins

Now again, I agree entirely with you there and I think that is reasonable criticism. Hopefully, the Department of Health has taken this on board as it is potentially an "own goal" and something that we need to avoid in the future.

Martin Kiernan

President, Infection Prevention Society

Outcomes are a product of the system. Part of the system is education for those who practice, yet we struggle to see good educational standards at undergraduate and postgraduate level, both in medical nursing and at the heart of professional training. Do you have any comments on that issue?

Dr Eleri Davies

Education is a key issue; to start it as soon as possible - it needs addressing at the undergraduate stage. The challenge is to ensure that the infection control teaching is relevant at the right points in time. My perception from the work that I've been doing is that it is potentially better organised in the nursing undergraduate training than it is in the medical school undergraduate training. I have no direct experience of the nursing undergraduate training so Martin may correct me if I am wrong, but I have certainly admired some of the work that my nursing colleagues have done in the undergraduate training. The challenge for medical training is to try and ensure that the basics are not missed out because the curriculum is becoming too full and focused on the more complex matters. Scotland has a wide-ranging education programme, through National Education Scotland, and Wales has been able to buy in some of that. The e-learning programme, for example, that has been very successful in Scotland for all levels of healthcare workers has been adopted in Wales and we are currently revising how we are using it. We are trying to move to a position where a standard e-learning package is delivered at undergraduate training for nursing and medicine, top-up training then in the post-graduate phases. It is something that, ideally, should have very strict guidance on

what should be delivered for all our healthcare staff so that they're correctly prepared. Personal protective equipment is another bone of contention from my point of view, which does not seem to be discussed appropriately.

Dr Brian Iddon

I am going to hand over the chairmanship to my Lords' colleague. I apologise for having to leave but I have business elsewhere. However, it has been a delight to see some familiar faces in the audience, and I look forward to the outcome of this meeting when it is written up and circulated.

Healthcare-Associated Infections: The Technology Innovation Programme.

Presentation by Sandra Barrow

Operational Workstream Lead, Healthcare-Associated Infection Technology Programme, Department of Health

The Healthcare Associated Infection Technology Innovation programme sits within the Department of Health. It is a three-year programme and we are currently coming to the end of the second year. The programme came about as a result of two key challenges.

The first challenge was from the Department of Health in terms of supporting the reduction in healthcare-associated infections, a top priority. There was also a challenge from industry in the sense that the time, cost and effort that went into producing the products or an idea and actually getting that product adopted and diffused within the NHS was significant. As a result, the programme was formulated and this sits alongside good hand hygiene, good antibiotic prescribing, cleanliness and good clinical practice, with an important role to play. The scope and objective of the programme is to speed up the innovation and adoption of new and innovative technologies that can be shown, or might be assisted to show, clinical effectiveness against healthcare-associated infections and support industry to make them available to the NHS.

The programme is looking at how we get the best value for money from technology and how we can get industry and the NHS working together. The whole programme has various different project work streams. Some are just starting, some are completed, some are mid-stream. There are probably about fifteen different work streams, but we can split them up into five distinct areas. One is about getting the NHS to come up with new ideas, new needs and so on, and to identify the types of products and technologies that the NHS needs. On the other hand, there is support for innovators and suppliers; if they have got an idea or a product how we bring that to market. Then about assessing those products on behalf of the NHS to see which ones work, which ones do not and which ones need modification.

Once we have the good products, it is about showcasing them and trying to encourage their adoption and diffusion throughout the whole of the NHS. Underlying those aspects is the whole adoption process.

Invention to adoption is a difficult process and we need to find ways to help speed it up. Also, some of the projects that we have done within the programme are having wider application in terms of other areas of work. I want to walk you through a couple of the project areas that are underway and how they relate to those key facets.

There was a programme called Smart Ideas, which some of you may be familiar with. We went out to groups of NHS staff and infection control nurses, facilities managers - a whole spectrum of people - to see what sort of products and devices we would need. That was a long process and we got lots of ideas. They were not necessarily products, they could have been ideas or concepts that were summarized and assessed. We ended up with ten products that we have taken and worked with the National Innovation Centre to bring those products to prototype stage. *Figure 6* illustrates a temporary isolation unit. This is a product that came from the NHS's need for more single rooms. The practicalities of having single rooms are not always easy hence we are at the prototype stage now with this mechanism. A Trust could have this kit within its Estates function and within half an hour this kit could be assembled round a bed, converting a four-bedded bay into having a "single room" around that bed.



Figure 6. A temporary isolation unit

At this stage, the products have been the subject of clinical trials in hospital and we are now going out to the market to have manufacturers make it, with a view that this idea came from the NHS. The approach is that the NHS has come up with the idea and now we are going to the market.

Another programme that we have been involved in is Design Bugs Out, in partnership with the Design Council (<http://www.designcouncil.org.uk/our-work/challenges/health/design-bugs-out/>). The remit of this project was to work with the Design Council with the aim of re-designing hospital equipment and furniture to make them easier to clean. If products are designed to be cleaned more easily then the chances

are that they will be cleaned more easily, more often and more effectively. We had the NHS working with designers and manufacturers, looking at the particular areas of concern and what products needed re-designing. Some of the common products that required re-design were: the commode; bedside cabinet; the patient's chair; and the porter's chair. We commissioned designers and manufacturers to work together. We did not just say to them, "We want you to go away and re-design the commode"; it was an intuitive process where they would have stakeholders in the NHS who would give them feedback. Some challenging meetings were held where people came up with an issue on facilities and infection control in another area *et cetera*, working together to get products at a prototype stage.

We now have products and we are at the stage of testing and development. One of the remits to all the companies designing the products is cost control. It is no good producing a marvellous product that is five times more expensive than the currently available products. A key priority is that a product has to meet the brief in being more cleanable and more resistant to any sort of contamination, but equally it has to be price comparable. The companies are gearing up production and in springtime we aim to have sufficient quantity of these products to evaluate them properly in eight hospitals across the country. While the commode has had "rave reviews" in terms of aesthetics, features and cleanability, we need to see that in use and evaluate it properly.

Another programme is called Design for Patient Dignity (<http://www.designcouncil.org.uk/our-work/challenges/health/design-for-patient-dignity/>) which is following exactly the same process. This was launched at the end of March with products to address this particular agenda.

Moving away from new ideas, we also support companies and innovators with a number of work streams. One is the Smart Solutions programme (<http://www.smartsolutionsforhcai.co.uk/>). Five hundred small and medium sized enterprises across the country were engaged with to see whether they had products that they were having trouble selling to the NHS. Two hundred and forty-eight existing products and technologies from UK, Europe and the USA have been reviewed by an expert panel of specialists from the NHS, industry and academia. Nine winning products assessed as having potential to help the NHS prevent or control the spread of healthcare-associated infections are currently being evaluated within Trusts across the country. If these products were seen as effective, what do we do next? Are they so effective that we want to be recommending them across the NHS or do we need to carry out further trials in different Trusts?

Product Surgeries allow innovators to meet with Department of Health advisors and scientists to gain expert advice on: the potential for new ideas to be attractive to the NHS; The Rapid Review Panel; marketing to the NHS; and public sector procurement systems and how they work. Since the programme started we have facilitated three hundred Product Surgeries. It is an opportunity for any supplier who has a product connected with the healthcare-associated infection agenda to come along and meet with people from the Department of Health to obtain guidance and steer on their product. From our point of view Product Surgeries are an ideal opportunity, not only to provide a good service to industry, but we also acquire knowledge of what is out there in terms of new technologies.

I touched briefly on the Rapid Review Panel with which you may be familiar. The Panel is run by the Health Protection Agency, which assesses products for efficacy from a scientific point of view. There are seven bandings and the ultimate goal is to achieve a Band 1 assessment from the Rapid Review Panel. Companies that previously obtained a Band 1, which meant that the product was first class in terms of efficacy, were

having trouble selling it to the NHS. These products tend to be new, novel devices so there are cost pressures on them, leading to trouble with adoption. We set up Showcase Hospitals as a work stream within the programme. We have eight hospitals across the country listed as Showcase Hospitals, chosen specifically because of their enthusiasm for the healthcare-associated infection agenda. There is also a good cross-section of different types of hospital across different buildings, sizes and so on.

Each of the Rapid Review Panel Band 1 products has gone into all the Showcase Hospitals and has been evaluated for up to six months. Evaluation in hospitals is not about efficacy but different facets of in-use applications. Following that trial period with a great deal of data collection, analysis and reports, we have produced a summary report available on the Department of Health website (<http://www.clean-safe-care.nhs.uk/search.php>) which explains how we found the product and the issues with each product. This document also provides a Business Case template. If a particular Trust wanted to adopt a product, they would have all the information they would need to present to the Board, including the evidence from the Showcase Hospital, a “steer” and some of the potential pitfalls of the product.

The reports are not standard. For example, the Faetall Management System is a new and expensive device, but the potential cost savings that the hospitals incurred as a result of using it made it economically viable, in addition to added patient benefits. Some of the practical factors with the Bioquell Hydrogen Peroxide Vapour System for decontaminating the room are good and effective, but we need to have someone managing the process to ensure people are not waiting to decontaminate, and that rooms are left vacant sufficiently long for the room to be decontaminated. The aim of the Showcase Hospitals is to prevent the NHS from having to “re-invent the wheel”.

As well as the Rapid Review Panel Band 1 products, if the Showcase Hospitals are approached and have a particular interest in a particular product, they can adopt them as ‘local’ projects. We have a list of products that individual Trusts are underway with at the moment. Depending on the outputs, we will make the outcomes available to the wider NHS. We will also commission other pieces of work with the aim of one evaluation on behalf of the NHS. A couple of reports for publication assess the effectiveness of a range of microfibre cleaning cloths available on the market. Early indications show that on a product cost basis there is no difference in effectiveness. The cloths perform at their optimum level after seventy-five washes, so the challenge is, now that we know this data, how are we going to monitor in each Trust when they have been washed seventy-five times? It is a *Which?*-type report that, once finalised, can go out to the NHS and enable its staff to make informed decisions. Similarly, in a report on the effectiveness of disinfectant products at killing *C. difficile*, we are carrying out evaluation that we will assess products across the board.

We are entering the final year of the programme and developing the work that we have already carried out. It is a successful project, launched with good prototypes but, to me, it is about embedding it into the rest of the NHS. True success is if I go into my local hospital and those products are there. It is about embedding the products that have been proven. It is also looking at what we have done with Design Bugs Out and whether we can replicate that approach in other areas. In terms of helping industry to get over some of the adoption:diffusion barriers, how can we as a programme leave behind a legacy that makes a far simpler process for companies in the future?

Discussion session 2

Lord Harris

One of my preoccupations has been the way in which the health service develops the products of some of the small technology companies in this country. I am also interested in counter-terrorism and security, where the same issues apply. We have had described to us an exemplary way of talking to the innovators out there, finding out what they are developing and thinking and talking to them about it. It is then a process of selection and evaluation, which is tremendously important, not only in terms of solving problems but of encouraging small technology innovations in this country. This is important for the wider national interests and wealth. So I was pleased to hear that account.

Laura Ludman

Infection Control Nurse, Royal Orthopaedic Hospital NHS Foundation Trust

I am an infection control nurse at the Royal Orthopaedic Hospital in Birmingham. We adopted the silver catheters. It is an example of how incredibly effective such a strategy has been. We had a higher than usual catheter-associated urinary tract infection rate. We reviewed it and realised that we had a problem with it and introduced aseptic non-touch technique training and a Bardex IC catheter, which is rather more expensive than the plain old standard catheter that we were using. We have reduced our catheter-associated urinary tract infection rate from about thirty per cent to nought per cent in the past three audits. On the Plowman model, that has saved our Trust about one hundred and eighty thousand pounds. It has been remarkably successful. The financial people in the Trust were anxious about spending more on technology, but it has worked out extremely well.

Graham Thompson

Patient Governor, Sheffield Teaching Hospital

I take an interest in medical devices. I have always been aware of the constraints and compliance necessary for the medical device industry and of how slowly the developments in the health service are taken up. You were saying that you like to introduce certain things that would otherwise take a long time. There did not seem to be any real drive other than the conscience of the hospital concerned. I wonder why we still have the dual compliance issue; is it for the same reason?

Sandra Barrow

An individual Trust will still make a local decision to commit to a product. I come from a medical devices procurement background. With Design Bugs Out and the showcasing hospital we are testing products that set the protocol for how they will be evaluated, what we want the outcome to be and what we want the measures to be. We are doing that once and publishing the findings. At the end of the day, Trusts would have that decision to make. We would not come out and say, "This is an RRP 1 product and it must be used". One could always argue that from a Trust point of view if they had an increasing infection rate and there were products out there that had good evaluations. We have more of a challenge to ask why they are using those products. If we are doing it for products related to healthcare-associated infections, why not for medical devices?

Graham Thompson

We are working towards the same end. I take the point about rings: in the company I work for rings are permitted: one wedding ring, if necessary, but that has to be covered by a sterile covering before the staff go in to the cleaning room. That is a simple precaution but it seems to have bewildered the experts.

Ashley Brooks**Chief Executive, Max 4 Health**

I am the first Department of Health patient champion. I have an important comment and question. At the beginning of these discussions, it was great to hear people mention the "s" at the end of "infections". As we all know, MRSA and C. difficile are only two of thousands of infections. We need to concentrate on the others as well. I am still confused. My hands hygiene campaign was officially evaluated at Southampton Hospital. It is not technology but a piece of education and promotion on getting people to clean their hands.

I have been told by Christine Beasley, the Chief Nursing Officer, that the Clean Your Hands campaign, which has been running for four years, is now coming to an end. There is no central funding. We had a successful evaluation at Southampton hospital to say that, when we brought the Max campaign into a hospital setting people started washing their hands extensively and it set off other initiatives. Because it was so successful, she will recommend that they use the campaign throughout the NHS as the new hand hygiene campaign, which was great news received in November.

They wanted me to run around the country, which I am doing, going to different Trusts on the recommendation that they should be using the campaign as part of their infection control strategy. I have had many meetings over the past few months with various Trusts, PCTs, infection control units and so on. In the official evaluation report of Southampton Hospital, which is on the Government website, it states that, on average, every case of septicaemia, MRSA and so on, costs the NHS four hundred thousand pounds. But there is no money centrally or locally to adopt a hands hygiene campaign.

I am growing tired of saying this after seven years of doing so - if we cannot as a group of people motivate ourselves to do the basics first, everything else we discuss today is totally irrelevant. Every piece of new technology designed for the NHS becomes irrelevant if we bring bugs into that room. It starts with clean hands. My question is - as you can hear, I am frustrated because I have dedicated my life to this issue - if we have something that is so good that the Department of Health recommends it to be used across the country, it has been officially evaluated to say that it works fantastically well, why can I not get people to buy into it centrally or locally? I am out of answers. Will someone explain to me what I need to do next?

Sandra Barrow

It is not a Rapid Review Panel 1 matter so it has not gone through the RRP1 products. It was because of Ashley's endeavours that we looked at it as one of the local technology reviews in Southampton. It received an evaluation report that is on the website. As I say, it links with the work that the National

Patient Safety Agency is already underway with. Many Trusts have similar campaigns. In terms of Christine Beasley it would not be a recommendation for that product per se. It was an evaluation report, but unfortunately, irrespective of what the products are and even the RRP1 products, the Bardex catheter and so on where we have a positive result, it is still an individual Trust decision. In Ashley's example there are competing models that other Trusts have already adopted.

Dr David Jenkins

It sounds like a no-brainer: if we have a device, technique or tool that saves lives and money we would think that people would be falling over themselves to introduce it into hospitals. This reflects a larger problem in infection control, which is the quality of evidence that we are sometimes dealing with. I have not seen the product so I cannot comment on the quality of evidence to convince people, but clearly we need good quality evidence to show that it is going to be effective. We need to invest effectively to reduce the costs of infections and it is a barrier that we have to jump over to convince people that they need to spend the money to save money. The old adage is that you have to speculate to accumulate: that is what we have to do.

Who are you speaking to in the Trusts? Are you speaking to infection control nurses or to the Chief Executive or the Finance Director?

Ashley Brooks

It is a good question: I start from the top and work down - I always have done. I want to pick up Sandra's point: there are other campaigns out there but none have been officially evaluated by the Department of Health and recommended by your Chief Nursing Officer.

In addition, I write to everyone in the Trust and I hope someone will pick up the phone, email or correspondence. I meet the Head of Infection Control or the lead nurse. They listen to what I have to say: they are not decision makers, policy makers or accountants. It goes one stage and then falls flat.

Dr David Jenkins

This is effectively a failure of marketing.

Ashley Brooks

Yes.

Lord Harris

No doubt that note will be taken up separately. Can we move on? We will now hear some research and development presentations. We will first hear from Dr E David McIntosh.

Treatment and Prevention of Healthcare-Associated Infections: A Perspective from the Pharmaceutical Industry.

Presentation by Dr E David McIntosh

Global Scientific Affairs Senior Expert, Novartis Vaccines and Diagnostics; Honorary Clinical Senior Lecturer, Imperial College London

The report by the European Academies Science Advisory Group dated April 2009 stated that,

“About 7% of patients in acute care hospitals in the European Union experience healthcare-associated infections, resulting in a considerable public health burden, with about 37,000 directly-attributable deaths per year and perhaps three times as many partly-attributable deaths”.

I will first look at healthcare-associated infections due to bacteria. The Health Protection Agency (HPA) monitors the prevalence and incidence of healthcare-associated infections, and publishes regular reports. The Fifth Report of the Mandatory Surveillance of Surgical Site Infection in Orthopaedic Surgery April 2004 to 2009, for example, reported that approximately one in a hundred patients undergoing hip prosthesis, and one in two hundred undergoing knee prosthesis, develop a surgical-site infection, and that over fifty percent of these infections affected the deeper tissue or joint. *Staphylococcus aureus* including MRSA continues to be the predominant micro-organism causing these infections.

Authors from the Albert Einstein College of Medicine, New York, have stated in a recent Expert Review of Anti-infective Therapy that: “Community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) has emerged as an almost ubiquitous pathogen in many areas of the USA and worldwide. The gold standard antimicrobial, vancomycin, has several shortcomings that have prompted the development of newer agents for the treatment of MRSA disease”.

New antibiotics have been developed to cover *Staphylococcus aureus* in general and MRSA in particular. Provided the detection and diagnosis of this type of infection is made early enough, then suitable antibiotic treatment can be implemented. The pharmaceutical industry can also contribute by developing rapid diagnostic tests that identify not only the pathogen but also the antibiotic susceptibility of that pathogen.

A broader question is whether or not adherence to treatment protocols and algorithms enhances or inhibits the doctor’s ability to manage the patient. The availability of broad spectrum antibiotics and so-called expanded broad spectrum antibiotics reduces the chances of treatment failure but increases the chances of changes in the normal flora of the gastrointestinal tract. The preservation of this normal flora, or perhaps the rapid restoration of the flora after exposure to antibiotics, should be criteria against which new antibiotics are judged.

The HPA Mandatory Surveillance of Healthcare-Associated Infections Report 2006 also highlighted the importance of *Clostridium difficile*, in addition to *Staphylococcus aureus*, as a cause of healthcare-associated infections. This is perhaps the example *par excellence* of the need to preserve the normal gastrointestinal

flora, because with replacement by *Clostridium difficile* comes the risk of diarrhoea, complications, prolonged hospitalisation and death. According to the HPA 2006 report, by 2005 there had been a seventeen point two percent increase in reports of *Clostridium difficile* disease in those aged sixty-five years and older to fifty-one thousand, six hundred and ninety when compared with reports from the previous year.

As a result of improved hospital environmental practices, research into *Clostridium difficile* disease itself and the emergence of antibiotics less likely to cause this infection by “collateral” damage, there have been decreases in this form of diarrhoea over recent years.

With the use of certain antibiotics which act against MRSA there is the possibility that they will drive the emergence of not only *Clostridium difficile* but also vancomycin-resistant enterococci (VRE) and multi-drug resistant enterobacteriaceae. The emergence of antibiotic resistance in these Gram-negative organisms, the fact that there are very few antibiotics able to cover them and the unlikelihood that there will be any such antibiotics in the future means that there is a growing gap in the antibiotic armamentarium.

The Gram-negative multi-drug resistance is endemic not only in the hospital setting but also in the community setting and the resistance mechanisms are transferable not only to other organisms but also towards other antibiotics⁴. These authors state: “Antibiotic resistance is now a linked global problem. Dispersion of successful clones of multidrug resistance (MDR) bacteria is common, often via the movement of people. Local evolution of MDR bacteria is also important under the pressure of excessive antibiotic use, with horizontal gene transfer providing the means by which genes ... spread amongst different bacterial species and strains.”

There is a need for the pharmaceutical industry to develop new antibiotics. But should these antibiotics be broad spectrum or narrow spectrum? The development of antibiotics specifically targeted against specific organisms is appealing but doing this is impractical under the present regulatory framework. Obtaining enough patients infected with the target organism for inclusion into a clinical trial would be a formidable task. And there would need to be more incentives to protect the intellectual property of the organisation developing such antibiotics in much the same way that the European paediatric regulations allow for the extension of the patent life of medicines in exchange for including paediatric patients in the clinical trial programme.

So, it is possible to contract bacterial infections by virtue of admission to hospital. But what about viral infections? A multi-centre study in Spain suggested that twenty-nine percent of hospitalised paediatric patients with rotavirus infection had contracted the infection whilst in hospital³. A large single-centre Sanofi Pasteur MSD sponsored study performed at the Alder Hey Children’s Hospital in Liverpool, UK, found that thirty-one percent of healthcare-associated acute gastroenteritis was due to rotavirus². The general availability of effective vaccines against rotavirus and the implementation of universal paediatric rotavirus immunisation programmes appears to be one practical way of reducing healthcare-associated infection. There is a pressing need for a vaccine against respiratory syncytial virus, a common cause of nosocomial respiratory tract infection.

There has been little in the way of research into vaccines for the prevention of healthcare-associated infections. The results of a study into the use of a *Staphylococcus aureus* conjugate vaccine in patients receiving haemodialysis was published in 2002⁸. The vaccine known as StaphVAX™, developed by NABI, covered only two capsular polysaccharide types, five and eight albeit the two most prevalent types, but unfortunately the efficacy results to date have not led to licensure of the vaccine. There was no clear reduction in *Staphylococcus aureus* bacteraemia beyond the first year in vaccine recipients.

Merck Research Laboratories has been studying the potential of *Staphylococcus aureus* conserved protein antigen iron surface determinant B against serotype 8 as a vaccine target by developing both a vaccine and monoclonal antibodies¹. However, the resulting functional capsular antibodies may not be sufficient in themselves to confer protection. Pfizer and Novartis Vaccines are also developing vaccines against *Staphylococcus aureus*.

Staphylococcus aureus vaccine does have the potential to reduce substantially invasive MRSA disease incidence⁶.

A vaccine against *Pseudomonas aeruginosa* was found to reduce the proportion of cystic fibrosis patients infected and to delay the time to infection, but this vaccine is not yet licensed⁵.

Sanofi Pasteur is developing a vaccine to prevent *Clostridium difficile* infections⁷. The vaccine uses a toxoid-based approach which has been used extensively in licensed vaccines against tetanus, diphtheria and whooping cough. The candidate vaccine has successfully completed Phase I clinical trials in more than 200 participants to evaluate safety and immunogenicity. The trial started in the UK in 2009 and has expanded to include subjects in the USA.

Existing vaccines prevent healthcare-associated infections simply by preventing admissions to hospital. Influenza vaccination prevents people from contracting influenza which might otherwise necessitate their admission to hospital and consequent exposure to healthcare-associated infection. Pneumococcal vaccination prevents pneumococcal infection, the manifestations of which include meningitis, septicaemia and pneumonia, which generally require admission to hospital.

But what of the ethical aspects of a vaccine effective against healthcare-associated infections once it is developed? Should it be a pre-requisite for receipt of such a vaccine prior to routine admission for surgery? Could patients be denied routine surgery until they have been vaccinated? Would unvaccinated patients be obliged to sign a disclaimer absolving the hospital of responsibility should they suffer an healthcare-associated infection? And what guarantee would there be that the vaccine would be effective in a particular patient admitted to a particular institution? Would the vaccine have to be modified periodically to match the prevailing epidemiology of infection?

And for acute patients, those previously healthy persons admitted due to trauma or some other emergency? Would it be possible to develop hyperimmune immunoglobulin for passive immunisation that could tide them over until active immunisation had time to be protective? Whatever the situation, it is unlikely that it would be cost-effective to vaccinate the whole population against, for example, *Staphylococcus aureus* or

Clostridium difficile on the off-chance that certain members of the population will be exposed to these organisms during some future hospital admission.

In summary, the pharmaceutical industry needs to develop new antibiotics, new diagnostic assays and new vaccines for the purpose of reducing healthcare-associated infections. The antibiotics need to have a low propensity to alter the normal microflora of the gastrointestinal tract. The industry also has a responsibility to educate doctors and others about the appropriate use of antibiotics. It appears that vaccines targeting *Staphylococcus aureus* and *Clostridium difficile* are on the horizon, and the debate needs to start now as to how best to utilise such vaccines once they become available.

Discussion

Baroness Masham of Ilton

I had a question not long ago on PVLV MRSA: the community-type MRSA, which is far worse in America than here. I wondered whether there was any chance of a vaccine? Not enough people know about it. With the Olympics coming up, it is a problem. Young people are affected by the infection in children's playgrounds and the Army camps and art colleges. I have been dealing with the relatives and parents of some of the people who have died. They are small numbers in this country, but it is very infective and has to be treated fast. They die within two to three days.

Dr E David McIntosh

That is right. The idea behind the Staphylococcus aureus vaccine is to target that sort of infection.

The Challenges for New Anti-Microbial Medicines: A Lesson from History.

Presentation by Dr John Porter

Head of Speciality Medicine, Pfizer

There is a theory of six degrees of separation, which states that any person in the world can be linked through six other individuals through another individual. I need only three steps to link into my talk, because my father was taught microbiology by a dour Scotsman named Alexander Fleming. You will probably remember that in 1928 Fleming went on holiday, leaving his slightly chaotic lab assistant to look after his agar plates. He was horrified when he came back to find mould growing all over them, but ever the scientist, soon realised that the mould penicillium was producing an impressive antibiotic effect.

However, Fleming found penicillin too unstable to use outside the laboratory. It was not until over ten years later that Florey and Chain managed to purify the substance and use it for the first treatment in 1941. The first individual treated, as you probably remember, was a policeman who pricked his hand while pruning his roses and developed a skin infection followed by septicaemia. He made an impressive response to penicillin,

but the story does not end there, because a week later he sickened and died. The reason he died was that they had run out of penicillin.

There were great problems in producing enough penicillin initially to treat people. War-torn England was probably not the best place to produce it, so the UK looked to the US Government and they in turn appealed to US pharmaceutical companies. A consortium of Merck, Squibb, Lederle, Pfizer and others discovered a way to mass-produce penicillin, such that in January 1944 Pfizer was the first company to produce an industrial penicillin plant, which then meant that there was enough penicillin for all the troops on D-day. Florey himself said that too high a tribute could not be paid to the enterprise and energy with which the American manufacturing firms tackled the large-scale production of the drug.

Why have I told you this story? A key theme of my talk today is that we are facing a crisis which we will solve only with a similar level of public and private sector collaboration. The twin strands of the crisis are a decline in the discovery of antibiotics, as David has already mentioned and an increase in microbial resistance. On the problem of decline in discovery you may wish to refer to figures 7 and 8, which show the decline in antibacterial innovation by decade and by class.

Decline in antibacterial innovation

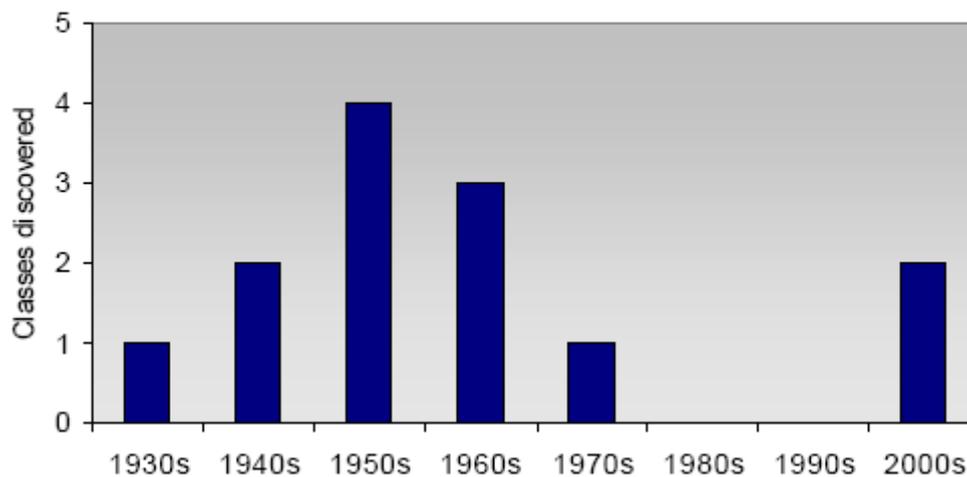


Figure 7. Discovery of new classes on antibacterials⁹.

We can see that the 1940s to 1970s were a golden age of antibacterial development where many new classes of drugs were introduced. However, over the past few decades, the rate at which new antibacterials have been discovered has slowed considerably. Although it looks relatively promising in the first years of this century, many of the new antibiotics at that stage had been discovered earlier and were brought through to manufacture later.

Decade of introduction	Class of antibacterial
1930s	Sulphonamides
1940s	Penicillins
	Aminoglycosides
1950s	Chloramphenicol
	Tetracyclines
	Macrolides
	Glycopeptides
1960s	Streptogramins
	Quinolones
	Lincosamides
1970s	Trimethoprim
1980s	
1990s	
2000s	Oxazolidinones
	Lipopeptides

Figure 8: Introduction of new classes of antibacterials⁹.

Considering Figure 9, an examination of the pipeline across the US pharmaceutical industry in 2004 showed what looked like a promising number of anti-effective medications in development. If we look more closely, we will see that of the thirty-one anti-infectives being pursued, only five were antibacterials.

Entity	No.
Cancer	67
Inflammation	33
Metabolic/Endocrine	34
Pulmonary	32
Anti-infective	31
Neurological	24
Vaccines	18
Psychiatric	16
Haematological	12
Gastrointestinal	13
Genitourinary	12
Ocular	4
Dermatological	4



Entity	No.
Anti-HIV	12
Other Anti-viral	5
Antibacterials	5
Antiparasitics	5
Antifungals	3
Topical	1

Figure 9: The pharmaceutical pipeline: Antibacterial development¹⁰.

As David has already mentioned, there were some exciting developments on the horizon with vaccines, but along with Novartis and Pfizer there were only a handful of other companies actively researching that area. Why is that? It is widely recognised that the discovery and development of new medicines is a challenging area for any new medicine.

Recently, Professor Sir Mike Rawlins, chairman of the National Institute for Health and Clinical Excellence, estimated that the cost of development of new medicines is around one billion US dollars (*Figure 10*). Of all areas of pharmaceutical drug discovery, antibiotics are probably the most challenging. That has been recognised by the Swedish presidency of the EU, which commissioned a team from the London School of Economics to look into the problems of drug discovery among antibiotics. They identified five interrelated factors.

- The first issue is that antibiotics are a short-term cure for acute disease. In terms of recouping the money put into drug discovery, the ideal is to have long-term medication taken by large numbers of the population. Although having a short-term cure is ideal for the patient, it makes it difficult to make it economically viable.
- Secondly, unlike most drugs, which gain more value as we know more about them, antibiotics are like new cars: as soon as we drive them out of the showroom they start to decrease in value because of the increase in resistance.
- Many antibiotics are produced generically in the marketplace. They tend to drive down the cost that can be charged for a new antibiotic reasonably.
- Typically, a new medicine will have only half of its twenty-year patent life left by the time it comes to manufacture in which to recoup the costs. If we drive down the prices, we are left with an uneconomic model.
- Finally, understandably, restrictions are put in place to stop resistance to new antibiotics. Often a new antibiotic will come to market but then be used in only a handful of cases initially.

Source	Estimate US\$ millions
Boston Consulting Group (2001)	880
Di Masi <i>et al.</i> (2003)	802
Adams and Branter (2006)	868

*Figure 10: Costs of development of new medicines*¹¹.

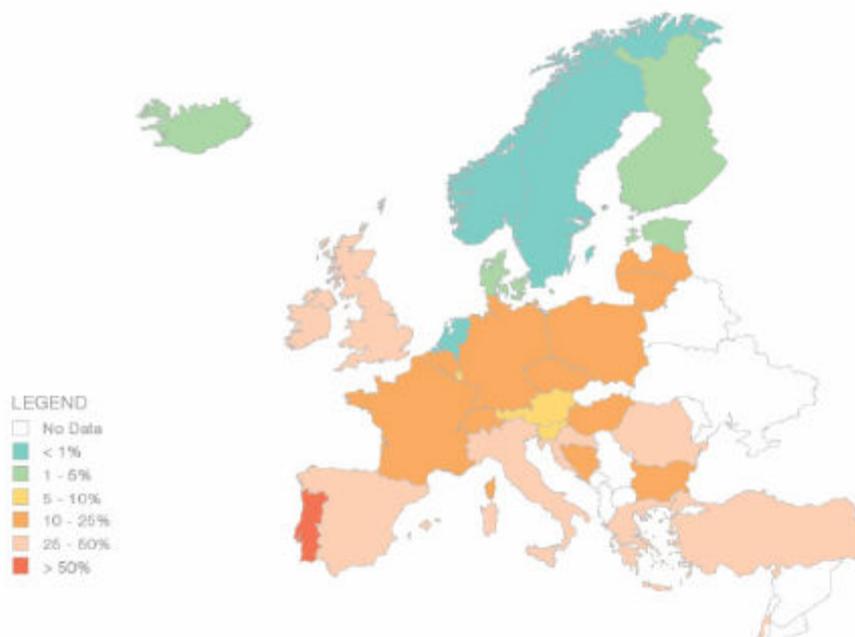
In short, antibiotics are expensive to discover and develop. There are significant factors driving down their economic value; such that in pure financial terms a new antibiotic is worth roughly ten times less than a new treatment for rheumatoid arthritis.

Why do companies continue to invest in this area? I came into the industry only two years ago, so I can bring an NHS perspective to that question. Someone in Pfizer said to me, “We don’t sell vacuum cleaners”.

Although it sounds a little cheesy, people in industry are keen to be at the forefront of innovation and to help advance patient care.

The second theme is antibiotic resistance. The first thing to remember is that if we want to be a successful organism, we do not want to be a human but a bacterium! Bacteria have colonised almost every environment on the planet, from the ice caps through to thermal vents. They are successful because they adapt to their environment rapidly. As we have already mentioned, resistance to antibiotics is classic Darwinian natural selection. Given that most antibiotics derive from a natural product, somewhere out there is likely to be a bacterium that has come across the new antibiotic previously and survived. How big a problem is it? The WHO believes that it is a big problem. In 2000 it requested a massive effort to prevent the healthcare catastrophe of tomorrow and it has continued to suggest that it is a continuing problem. When the Swedish Government took on the EU presidency they suggested that with that action we risked returning to a pre-antibiotic era, which would make many of the advanced medical innovations we take almost for granted these days, such as neo-natal care, hip replacements, transplants and cancer treatments unviable.

Resistance is increasing. Considering *Figure 11*, we will see that although a great deal of work has been carried out on MRSA, there is still a lot of MRSA out there. We have talked a great deal about Gram-positives; Gram-negatives are also an issue. There is a lot of minor penicillin-resistant *E. coli* out there. Increasing globalisation and air travel mean that resistant bugs can travel quickly all over the world.



*Figure 11: MRSA rates in Europe 2008*¹².

Inappropriate antibiotic use is often seen as one of the causes of resistance, but the reasons for inappropriate antibiotic use can be complex. There has been research showing that doctors often believe that patients want antibiotics when patients often want explanation. I have been lucky to have my clinical

practice in paediatrics. Because most antibiotics taste disgusting, kids do not want them, but that is not necessarily the same for adults.

It is interesting that societies differ in their expectations around antibiotics. For instance, if your child has an ear infection in the UK and you take them to a general practitioner, many parents will expect their child to be treated with antibiotics and many GPs will treat the child with antibiotics. In Holland there is a different attitude: they expect some painkillers and some advice. If we look at the clinical outcomes, they are much the same.

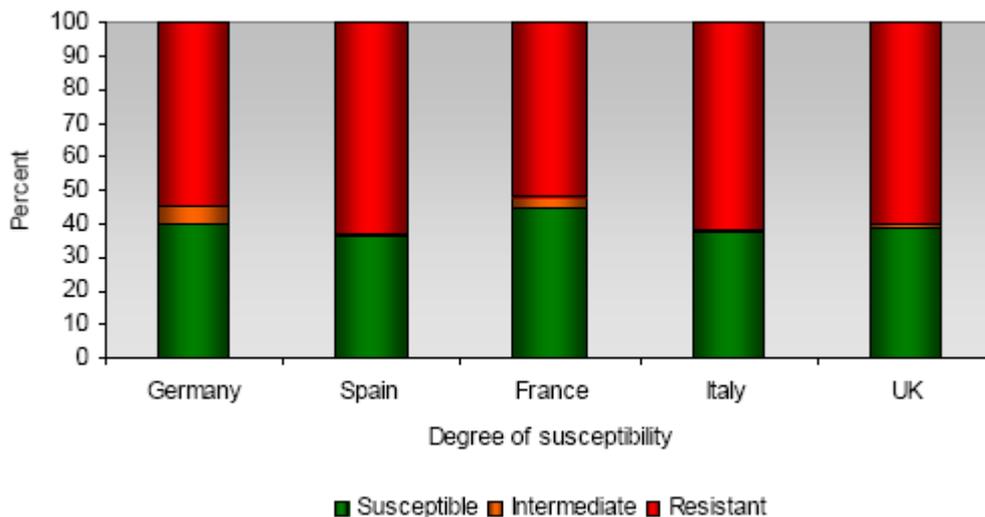


Figure 12: Aminopenicillin-resistant *E. coli* rates, 2008¹².

We have two big challenges in decline in discovery and increasing resistance. What about two possible solutions? There is both a short-term and a long-term aspect. Short-term antibiotic stewardship and all the healthcare isolation and the wonderful work that has been done by patient groups looking at ways of preventing infection is ideal. What is antibiotic stewardship? It is prescribing for the best clinical outcome while minimising the unintended consequences of antibiotics. It works only with comprehensive infection control. We need to remember that antibiotic stewardship involves all of us. It involves politicians promoting good infection control, physicians prescribing appropriately, patients finishing courses of antibiotics that they have been started on and companies promoting the appropriate use of their antibiotics.

In the long-term, how do we solve the issues of drug discovery? The Swedish Presidency of the EU announced its recommendations on 1 December last year. They revolve around ensuring awareness of the problem of resistance, developing preventive strategies and strengthening incentives for pharmaceutical companies to keep developing drugs. Those options and methods could include push mechanisms to remove bottlenecks in the early stages of research and pull mechanisms to help to pull successful products through into the marketplace.

The political focus on healthcare-associated infection in the NHS has brought improvements and continues to bring improvements in infection control. Good antibiotic stewardship is going to be vital to keeping our current portfolio of medicines effective, but greater partnership between industry and the public sphere is

essential to improving the problem of declining drug discovery and development. As with penicillin, we should pull together in the face of a common enemy.

Discussion session 3

Pida Ripley

Patient Governor, King's College London NHS Foundation Trust

I am appreciative of the NHS. I consider myself a grateful patient and I try to be a good Governor. That is quite difficult. I would like to sketch a little series of events that have made me a cynical Governor. David Jenkins said that one of the biggest problems is complacency; another is cynicism - that of patients and the public. As a Governor I participated in the preparation of the Standards for Better Health commentary that the Governors could send to inform the Standards for Better Health. We found that the hospital was not taking due care with infection control in some aspects: frequency of cleaning and other areas. In the Board of Governors, there is some contention about that matter because the hospital has such a fantastically good name that one was made to feel rather like a "whistle blower." Standards for Better Health received a report that was not supported by all the Governors.

The Care Quality Commission came in five weeks after the deadline and, horror of horror, discovered appalling failures: more than nine hundred mattresses needed to be replaced; they were soiled with bodily fluids. Commodes were not being cleaned properly. Nurses declared that they had not been trained, and on the frequency of cleaning the Governors discovered that the contract had not been revised for nearly ten years because of financial requirements or worries that they would have to spend more money. The Care Quality Commission came in and "caught them red handed". Three months later they passed as having tackled all those points, but what does the Governor say to the patient who has read about this report by the Care Quality Commission in the press - and then the hospital scores double excellent on the basis of the submission of Standards for Better Health? I do not know what to say to a patient who says, "What is going on: one minute you are doing something you should not be doing; the next minute you are receiving double excellent for the faulty Self-Assessment submission?" I know that the Care Quality Commission is saying, "We are going to inspect more thoroughly and more frequently," and the Self-Assessment programme is suspect.

The young man earlier spoke about campaigns. Campaigns are important. Everything we have heard today has played its part, but we fundamentally cannot get away from human behaviour: of the managers and the staff of hospitals who rightly want to support the great name of the hospital, but complacency has led them to be rather slack. You must listen to patient voices. Patients are rightly cynical about the situation: when we keep reading about these disasters in the newspapers but no one appears to be blamed. Can we please ensure that the Care Quality Commission develops some real teeth and stops praising hospitals? If we are after zero tolerance, let it be zero tolerance and let hospitals be shamed.

Lord Harris

Does anyone else want to comment on those clear and well-made points? There is a huge debate about the Self-Assessment programme. It seems to me that self-assessment is an important starting point for any organisation in thinking through its own issues but that is not and cannot be the end point.

Dr David Jenkins

The Self-Assessment programme is a starting point. An even better starting point is getting someone else to assess you. We set up locally in Leicester a reciprocal arrangement with Nottingham to carry out self-assessment exercises in infection control a few years ago. We find them useful both for having a fresh pair of eyes looking and detecting problems that we had not seen or appreciated, and the same applies to Nottingham. Both of us got some value out of that process and I would encourage it. At the end of the day the Care Quality Commission needs to make those inspections themselves and needs to make them rigorously without favour and harshly, in a sense.

Derek Butler

I attended a conference where someone said to me, "If you want to learn what's going wrong, listen to your customers." He was saying, do not treat a complaint as a complaint. It is a free consultancy. Your patients are telling you where you are going wrong. The NHS needs to learn that. It is changing its mindset from, "This patient is complaining" - they are not, they are telling you what is wrong. The lady is right.

Lord Harris

When I was a little boy, I was Director of the Association of Community Health Councils. That was all about ensuring that the voice of patients was heard by those responsible for running local services. It is a valid point that the users of the service are far more aware of how things are working than the senior managers.

Graham Tanner**Chair, National Concern for Healthcare Infection**

I want to pick up on John and David's points on antibiotic stewardship. This has been in place in hospitals. It can be monitored. Ways of monitoring have been introduced and audited. The problem appears to be the stewardship of antibiotics in community practice. People are given antibiotics and, as a result, develop further infections following on from that. If we do not do it across the board then surely the patients suffer as a result. If we are going to have that stewardship, it must be across everything. We have to learn from what has happened in Wales and Scotland in terms of their integrated approach towards patient care.

Dr E David McIntosh

With the development of vaccines that are preventing serious and life-threatening infections, doctors generally are going to be less worried about missing a serious life-threatening infection in that one sees a patient and does not know whether they are going to die, so one gives them an antibiotic on the chance that they are going to be prevented from dying.

Once there are vaccines preventing pneumococcal, meningococcal and other forms of septicaemia, doctors will be less worried about their patients dying and in the community less likely to feel that they will have to use an antibiotic because the patient is more likely to get better by themselves. I want to keep emphasising that vaccines play a role in antibiotic stewardship.

Dr John Porter

I will make a slightly different point. I will almost take my pharmaceutical hat off and keep my hat on as a clinical physician because I still do clinical practice. One of the things that has changed is doctors' training. The less trained one is the more worried one is about what could happen to the patient in front of you. In my paediatric practice I have seen people become much more worried about the child with a rash. There is a feeling that one cannot submit a child for observation because then one is not doing anything. We have to be doing something, so then we place them on broad spectrum antibiotics. We need to look at the risk: benefit. It is accepting a little more risk. Obviously, something like vaccination can help to reduce that risk but we have to realise as a society that we have to accept a little more risk and there is never an entirely risk-free situation in healthcare.

Dr E David McIntosh

I have a question related to a point I raised in my talk about when the vaccines are available: Staph aureus, C. difficile, pseudomonas and other vaccines. The patient advocate group is going to recommend to the patients that they be vaccinated. Will it be optional or obligatory for prospective patients to be vaccinated against a healthcare-associated infection prior to their admission to hospital or will it be left as voluntary take-it-or-leave-it?

Lord Harris

That is an extremely valuable debate to be having and I suspect that people want to talk about it.

Jean Hardiman Smith

Health Advisor, Civil Service Pensions Alliance

I go round my local hospital as part of the team assessing it for cleanliness. The staff are refreshingly honest and therefore find themselves much lower down the scale than at the other hospital in my area which is not terribly clean, yet one hospital comes out with "excellent" and the other hospital comes out with just "good". There is not much incentive for a hospital when it is carrying out its own assessments.

Lord Harris

That is exactly the issue around self-assessments: it is often about the processes. Often, those who are open and honest are penalised, rather than the other way round.

Laura Ludman

I wanted to make a point about the importance of education, which came up earlier. There are various strategies which cross nurses, ambulances and theatres - which are different from wards in hospitals. One of those is aseptic, non-touch technique. There was a dynamic approach by Stephen Rowley in University College Hospital London to defining what could be achieved on a ward, or

anywhere, and the use of terminology. For example, "sterile" is an incorrect term; it is about knowledge, making an informed decision and knowing what you can and cannot touch. That is fundamental. Good hand hygiene is obviously part of it, but it also about being knowledgeable about what you can and cannot do and which parts you can and cannot touch, both on and off the patient. That applies across the board to doctors, nurses, physiotherapists; everyone.

Concluding Remarks

Lord Harris

On that note I will thank all our speakers. We have had a fascinating series of presentations with many issues raised and a great deal to take away and consider. The plan is that this meeting will be written up so that we can refer back to it and look at the issues: the report will be circulated to everyone.

Presentation of 'Calls for Further Action' by Patient Groups

Hosted by Lord Toby Harris
The Attlee Room, March 9th 2010

Lord Harris

In October 2009, I hosted a reception attended by the Department of Health and members of the European Centre for Disease Prevention and Control (ECDC). These groups met for a joint conference on "Working together to tackle MRSA and other healthcare-associated microorganisms." This event provided the Department of Health the opportunity to showcase to experts from the twenty-seven EU member states, and beyond, the approach and methodologies used in England to achieve the significant reductions in healthcare-associated infections.

After that event, I felt it was appropriate to invite other groups of people to come together in this place to focus on this topic - people at the "sharp end" of patient engagement and delivery of NHS services. The presentations we heard in the Review Session underlined just how much we need to remain engaged in tackling avoidable infections, and the vital role that everyone has to play by working in partnership.

I wish to introduce three speakers. Firstly, Janice Stevens CBE, who is to be congratulated on being awarded the CBE this year, for services as National Director for Healthcare-Associated Infections and Delivering Same-Sex Accommodation.

Secondly, Graham Tanner, Chair of the National Concern for Healthcare Infection and, finally, Fiona Loud, Chair of Kidney Alliance. Both Graham and Fiona are here as representative spokesmen on behalf of a range of other patient-focused groups who get together around the table on this issue.

Janice Stevens CBE

National Director, Healthcare-Associated Infections and Cleanliness, and Delivering Same-Sex Accommodation, Department of Health

Thank you Lord Harris. I do, indeed, recall the Reception which you hosted for international colleagues attending the meeting the Department of Health arranged with the European Centre for Disease Prevention and Control. That was a welcome opportunity to share with European representatives the actions we have taken to combat avoidable infections, and the successes that have been achieved.

Tackling healthcare-associated infections this has been a top priority, from Government level to the level of local NHS service delivery. The programmes have been far-reaching and have sought to engage as many people as possible. The goal has been 'No avoidable infections'.

The successes on MRSA and *C. difficile* exceeded the targets set at the start of the programme. This success was delivered at the front line by healthcare and infection control teams, many of whom are represented

here today. Also very important has been the educational outreach that patient groups and involved service users have been engaged in delivering so well.

It's important to maintain the progress that has been achieved and to extend action to tackling emerging infections in a sustainable way. Everyone has a part to play. Thinking about the participants in this event this afternoon, there is a particularly important role for the third sector; that is, patient groups, service provider groups and motivated individuals. I encourage them to work in partnership with the NHS. The Department of Health fully supports this partnership and we were pleased to see an increasing number of patient groups becoming involved in recent months, and starting to work together on the shared objective of 'No avoidable infections'.

This event builds on a number of activities that have brought together patient groups and involved service users in recent months. I recall in particular a meeting chaired by Dr Iddon in April called "Healthcare-Associated Infections: Are we doing enough?" For the first time patient representatives from across a wide spectrum of diseases and interest areas were able to meet and discuss how healthcare-associated infections could affect their members, and how they could increase awareness among their members and the public to minimise their risk avoidable infections.

That event showed that while considerable progress was being made in tackling avoidable healthcare-associated infections there was a lot that the 'third sector' could do - as individual groups, in partnership with each other and in partnership with the NHS service. The meeting in April introduced the TEAM concept ie Together Everyone Achieves More to underline that there may be benefit to individuals and groups working together on shared objectives and common goals. It is very encouraging to see such a spread of representation of groups here this afternoon.

I came along to the meeting in November, which Dr Iddon also chaired. This reviewed the range of activities that charities and patient-focused groups undertake. There was also a very successful and wide-reaching brainstorming session on how the groups could extend their engagement on healthcare-associated infections and work more closely together.

Now I want to hand over to Graham Tanner to describe the wide range of activities that the groups do currently, and some of their achievements.

Graham Tanner

Chair, National Concern for Healthcare Infection

A number of charities have worked together and with the Department of Health across different disease areas to provide information to patients. This has included precautions that can be taken to reduce the risk of contracting a healthcare-associated infection, the implications of MRSA screening and decolonisation processes that are employed by NHS providers.

The views of patients have been presented, representing patients across a wide range of medical conditions. Patient views have also been included in responses to a number of consultations and policy-shaping initiatives.

Links have been formed on a European and wider international basis and some information has been translated into different languages in order to assist patients to access services, and to promote their involvement in healthcare provision.

Current mandatory surveillance applies only to two gram positive infections (MRSA and *Clostridium difficile*) and, whilst these have been substantially reduced, other infections, particularly gram negatives such as *E. coli* continue to show increases and resistance to antibiotics.

It is now appropriate to consider the next stage in the prevention of healthcare-associated infection bearing in mind the longer-term policy aim of transferring some services from the acute setting to primary and social care. This should include consideration for earlier discharge of patients who remain in hospital for antibiotic therapy, where it is clinically safe to do so. Transfer to oral antibiotics and, where appropriate, intravenous therapy in community settings are areas that need consideration

Approximately ten percent of infections relate to patients receiving dialysis and/or chemotherapy. Reductions in healthcare-associated infection is of substantial benefit to these patients, who will experience improvements in their quality of life and have greater control over their medication.

Moving forward, there is an increasingly urgent need for the groups to work more closely together.

It is particularly important to consider the future of healthcare and the issue of patient safety generally. During the period 2011/2014, the NHS is required to reduce costs by approximately twenty billion pounds. However, during this period the pressures to provide healthcare will increase enormously. The following figures exemplify the difficult decisions which will have to be taken during the period 2011/2013 and beyond.

	2008	2013	2018	2033
UK Population	61.383 m	63.493 m	65.683 m	71.600 m
Over 65's	9.821 m	14.600 m	15.800 m	20.500 m

Figure 13: Demographics of an aging population

By 2013 an extra five million people aged over sixty-five years will be requiring more intense health and social care from a system that is subject to possible contraction. It is, therefore, essential that the movement towards provision of more care in the community is appropriately managed and that patients and patient organisations are properly engaged in the development of these services. The delivery of safe and effective healthcare, with prevention of infection being one of the primary objectives, can only be achieved with the support and total involvement of patients, their carers and representative groups.

Fiona Loud
Chair, Kidney Alliance

Groups who have frequent hospital and community interaction are extremely vulnerable. Conditions do not exist on their own, but have exposure across many others.

I have a case example of kidney patient who contracted a healthcare-associated infection from a little scratch and eventually died from it. This underlines why patient groups should work together, and partner the NHS. People need to become more aware of the risks of healthcare-associated infections and how they can avoid them.

Patient groups, volunteers, involved service users and charities that offer healthcare services have a wide range of activities and areas of special interest. However, some healthcare issues are cross-cutting; and many groups share a common purpose of preventing avoidable healthcare-associated infections. Healthcare-associated infections are the most important correctable cause of harm.

Groups from a cross-section of healthcare took part in the meeting that Dr Iddon chaired in the House of Commons towards the end of 2009, including Kidney Alliance and the National Kidney Federation, Leonard Cheshire Disability, Marie Curie Cancer Care, National Concern for Healthcare Infection, National Voices, the Muslim Council of Britain and St John Ambulance, as well as a number of involved service users.

We considered four questions:

1. How we can share information with our members and the public
2. How we can engage in the community to translate policy into real improvements
3. Whether we can achieve more if all patient groups work together on shared goals
4. The priority areas in 'Calls for Further Action'

The outcome is captured in a poster, presented here today for the first time (Figure 14).



Figure 14: Calls for Further Action

This illustrates the key themes of: Education

- Messages of good hand hygiene to be extended in the community and nursing homes as well as in hospital, using the full panoply of local media, internet, TV and radio networks. The messages should be clear and simple, and accessible and appropriate for all sectors of our society. Messages in the media must be frequent.
- Information to be included in NHS Choices and linked with Health Promotion Days e.g. World Kidney Day.

Patient and Public Empowerment

- Patients being supported to know that it is acceptable to challenge staff when they do not comply with policies such as "Wash Your Hands". It's everyone's responsibility.
- A culture of responsibility to be encouraged, empowering patients to report lapses in infection control practices. Some surgeons still don't wash their hands, in my recent experience – is this cultural?

Care and Treatment

- Meaningful public and patient engagement to be encouraged by the NHS for its development evaluation: the use and publicity afforded by consultations to collect feedback; the sharing of evaluation data, including audits, with the public raises everyone's game, e.g. National Dialysis Access Survey. This needs to be expanded to other areas.

Partnership Working

- Healthcare professionals to engage openly and honestly with patients, involving them as partners in their own care. Much more involvement with GPs is needed in this.
- Staff welcoming and encouraging patients in reminding them about hygiene compliance and good treatment practices. People need constant reminders.

Scientific and Medical Investment

- A clearer view on the connection between healthcare-associated infections and underlying medical conditions that place some patients at particular risk, to encourage further group participation and strengthen their voice further.
- Horizon-scanning and ongoing research to understand better the emerging pathogens and how to deal with them - we mustn't lose sight of this continuing challenge even though inroads are being made on some conditions.

The groups support a TEAM approach because "Together Everyone Achieves More".

Lord Harris

Thank you to all our speakers.

Ends.

Appendices

Appendix 1: Speaker Biographies

Dr David Jenkins

Consultant Medical Microbiologist and Lead Infection Control Doctor, University Hospitals of Leicester NHS Trust



David qualified from King's College Hospital Medical School in 1985 and trained in medical microbiology in Brighton and Newcastle-upon-Tyne. He has been a consultant in Leicester since 1997. When the University Hospitals of Leicester (UHL) NHS Trust was formed in 2000, he became the lead infection control doctor and has held this position ever since. UHL is one of the largest trusts in the United Kingdom, with around 2000 beds and is a major teaching hospital trust. It serves a population of nearly one million patients in Leicester city and county, as well as patients referred for specialist care from across Britain. Over the last decade, infection control challenges have included higher than average rates of MRSA infections and a serious outbreak of *Clostridium difficile*. Rates of infection by both of these pathogens are now amongst the lowest in England. A Health Care Commission inspection in 2008 recorded unqualified approval of infection prevention and control practice in the Trust. Future challenges for David include even lower rates of MRSA and *C difficile* infections and ensuring best practice is firmly embedded into every day clinical practice throughout the Trust.

Dr Eleri Davies

Director, Welsh Healthcare Associated Infection Programme Team (WHAIP), Health Protection Division, Public Health Wales NHS Trust



Eleri qualified from the University of Wales College of Medicine in 1989. Following Junior Doctor posts in Medicine, Eleri trained in Medical Microbiology in Bristol. Appointed as a Consultant in Medical Microbiology with a lead role for Infection Control in Bristol in 1999, Eleri returned to Wales as a Consultant Microbiologist in Cardiff in 2003, taking on the Director role for the Healthcare Associated Infection Programme in Wales in 2006.

In her current role as Director of the WHAIP team, Eleri is responsible for delivering the National Healthcare Associated Infection (HCAI) Surveillance Programme in Wales and also supports the implementation of the Strategies for Reducing Healthcare-Associated Infections in Wales both in Hospital Practice and in the Community. The role also includes providing advice and support to the NHS in Wales regarding infection

control issues, developing model infection control policies for Wales and supporting education and training in infection control.

Since 2008 the patient safety campaign “the 1000 Lives Campaign” has been running in Wales. A significant part of this campaign has been directed at reducing the burden of healthcare-associated infections. Eleri has been working with the campaign team as Faculty Lead to take forward the application of healthcare improvement work in the fight against healthcare-associated infections.

Healthcare-Associated Infections have proved to be an interesting and challenging field to be involved with over the last ten years. Eleri’s challenges at present are to embed healthcare improvement work into the management of healthcare-associated infection across the newly formed Health Boards in Wales and to ensure that healthcare-associated infections are seen as a whole system problem and not simply about managing MRSA and *Clostridium difficile* infections.

Sandra Barrow

Operational Workstream Lead, Healthcare-Associated Infection Technology Programme, Department of Health.



Sandra is currently the Healthcare-Associated Infections (HCAI) Technology Programme Operational Workstream lead. The aim of the programme is to speed up development and adoption of new and novel medical advice and/or cleaning related technologies to further help combat healthcare-associated infections. It encompasses multiple workstreams which focus on generating innovation through: tackling infection with new technology, collaborating with the NHS, supporting innovators and manufacturers, evaluating and promoting technology products and encouraging use of technology across the health economy. Key outputs have included ‘*Design Bugs Out*’ and ‘*Smart Ideas*’.

Sandra is a purchasing professional by background and has worked in the NHS procurement environment for over 20 years at trust level, national level and all connotations between. She has had responsibility for a diversity of categories including Cardiology, Orthopaedics, Pressure Area Care, Surgical Instruments and Renal, involving management of a multiple of teams with responsibility for strategy and delivery. Sandra’s current role allows her to utilise her procurement skills but with an innovation focus in developing products and improving adoption as a key contributor to one of the Department of Health’s top priorities – reducing Healthcare-Associated Infections

Dr E. David McIntosh

Global Scientific Affairs Senior Expert, Novartis Vaccines and Diagnostics; Honorary Clinical Senior Lecturer, Imperial College London



David is an Australian paediatrician, vaccinologist and infectious disease specialist. Before Novartis, in Wyeth, David worked on the 7- and 13-valent pneumococcal conjugate vaccines, the intra-nasal cold-adapted influenza vaccine, the antibiotics tigecycline and piperacillin-tazobactam, and the anti-parasitic agent moxidectin, under development for the treatment of River Blindness in Africa. He originally trained as a medical doctor in Sydney, Australia, and specialised in paediatric infectious diseases. He has worked in Papua New Guinea, the Northern Territory of Australia, Peru and Argentina, New Zealand and throughout Europe, the Middle East and Africa.

His MPH treatise involved the study of chronic suppurative otitis media in Australian Aborigines and his PhD thesis described the molecular epidemiology of hepatitis B virus in recent immigrant families to Australia. He co-authored the landmark 50-year follow-up of the original congenital rubella syndrome patient cohort. His post-doctoral work was on gene therapy for hepatitis, in the Department of Medicine at Imperial College, a university in London, UK. Along with others, he performed a study entitled: "The epidemiological burden of influenza in infants and young children in East London".

David completed a four-year Higher Medical Training period in Pharmaceutical Medicine at the Royal College of Physicians, London, and is on the Specialist Register of the UK as a Pharmaceutical Physician and a Paediatrician. He has written chapters on pneumococcal vaccination, paediatric clinical pharmacology, and post-infectious sequelae/long-term consequences of infectious diseases. He is currently enrolled as a post-graduate student in a Master's degree in Medical Law and Ethics.

Dr John Porter

Head of Speciality Medicine, Pfizer



John trained in Oxford and Newcastle medical schools, qualifying in 1995 before specialising in paediatrics. He then further specialised in paediatric diabetes and endocrinology at Birmingham Children's Hospital. His PhD was in the genetics of childhood diabetes. He joined Pfizer from the NHS in 2008, and was appointed medical team leader for Pfizer speciality products in 2009- overseeing the areas of anti-infectives, endocrinology and ophthalmology. He continues to practice clinical medicine with weekly clinics in paediatrics.

Appendix 2: References

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