

Health and Social Services Committee

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Venue: Committee Rooms 3&4, National Assembly for Wales

Title: Hospital Acquired Infection: Evidence from Carmarthenshire NHS Trust

1.0 INTRODUCTION

This paper highlights the issues surrounding Healthcare Acquired Infections (HCAI) within Carmarthenshire NHS Trust and should be viewed within the context of the following documents: **Healthcare Acquired Infections – A Strategy for Hospitals in Wales (WAG 2004)**¹, **National Audit Reports 2000**² & **2004**³. The issues that we have chosen to highlight in this paper are those that the Carmarthenshire NHS Trust are focusing upon in order to meet the requirements of the strategy¹, which proposes a clinical governance and risk management approach that expects clinical teams to confront their own problems, guided and supported by specialist infection control practitioners.

The committee will be informed of the extent of the challenge in the Carmarthenshire NHS hospitals, what we are doing to manage these issues locally and how they are being monitored. Consideration is also given to what more needs to be done to minimise the spread of infection.

2.0 THE CARMARTHESHIRE NHS TRUST

Carmarthenshire NHS Trust was established on 1st April 1999. The Trust serves a population of 170,000 across Carmarthenshire and its neighbouring counties, providing acute and emergency hospital services through two main hospitals, Prince Philip Hospital in Llanelli and West Wales General Hospital in Carmarthen. Rehabilitation and intermediate care services are provided at three smaller hospitals throughout the county at Amman Valley, Llandovery and Mynydd Mawr. This amounts to 681 in-patient beds.

3.0 THE INFECTION CONTROL DEPARTMENT

The Infection Control Department operates on a Trust wide basis, comprising of one Consultant Clinical Microbiologist/Infection Control Doctor, two Infection Control Nurses and one departmental secretary. The primary purpose of the department is to provide an Infection Control Service for the Carmarthenshire NHS Trust.

4.0 THE EXTENT OF THE CHALLENGE IN CARMARTHENSHIRE NHS TRUST

4.1 National Standards

The NHS in Wales Strategy, 'Improving Health in Wales – A Plan for the NHS and its partners'⁴, highlights the need to underpin the achievement of measurable improvements in health outcomes with the setting, monitoring and reviewing of national standards of care.

Specific areas relevant to infection include, the Welsh Risk Pool Standards and the National Standards for Cleanliness. These aim to ensure that there is a managed environment, which minimises the risk of infection to patients, staff and visitors. The outcomes from this years audits in Carmarthenshire NHS trust are detailed in Box 1.

Box 1 National Standards

- **Welsh Risk Pool Audit 2004/2005 Carmarthenshire NHS Trust**

- Standard 14 Infection Control 98%
- Standard 30 Medical Equipment 90%
- Standard 35 Waste Management 75%
- Standard 36 Decontamination 93%
- Standard 23 Patient Nutrition 83%

National Standards for Cleanliness

- Baseline Assessment 2003 = 69% Internal Assessment
- Baseline Assessment 2004 = 81% External Verification

With regards to the Welsh Risk Pool Audit Standard 14 the Trust was identified as having good practice in terms of information leaflets for patients for MRSA and Small Round Structure Virus or Norovirus. It was also noted that Infection control awareness was apparent Trust-wide, and the hand hygiene campaign was high profile. Many staff discussed the importance of visitor compliance and it is recognised that restricted visiting time do operate within the trust.

4.2 Facilities

There is a requirement that patients will be treated in a physical environment that minimises the risk of infection. The afore mentioned National Standards (Box 1) together with work for the National Patient Safety Agency (NPSA), form a comprehensive framework for infection control and hygiene management.

Within Carmarthenshire NHS trust the Infection Control Team conducts an annual audit on isolation facilities the findings from which are summarised in Box 2.

Box 2: Main findings of Isolation Audit 2004

- Only 39.5% of side rooms across the Trust were occupied for infection control purposes.
- Improvement in compliance with requests for isolation from 70% 2003 to 84% 2004.
- 77% of beds visited had alcohol hand disinfectant available at the Point of Care (this is considered appropriate).

The findings from the audit demonstrate a continued improvement year on year.

More recently the Welsh Assembly Government has, in collaboration with NHS Estates, conducted a survey of isolation facilities in Wales and will in due course provide further guidance for Trusts.

4.3 Training & Education

Staff require access to effective training schemes in order to understand and discharge their roles and responsibilities in relation to infection control. In addition to over 70 in-house training sessions delivered during 2004 the Infection Control Department were able, with a non-recurring allocation of money from the Welsh Assembly Government, to fund five qualified nurses to study for the new Level 2 Diploma Module in Infection Control Principles & Practice at Swansea University.

4.4 Surveillance & Audit

4.4.1 Surveillance

Incorporation of an **effective** surveillance programme with regular feedback of results to clinical staff has proved to contribute to reductions in the incidence of HCAs⁵. To achieve this surveillance must be structured, with agreed definitions, consistent data collection methods and appropriate statistical analysis to underpin conclusions. Frequent and timely feedback to clinical staff is essential.

The Carmarthenshire NHS Trust currently participates in the following schemes:

Mandatory Surveillance Schemes

- Orthopaedic Surgical Site Infection (SSI)
- Outbreak Surveillance
- *Clostridium difficile* Surveillance
- *Staphylococcus aureus* (*S. aureus*) Bacteraemia Surveillance
- Infection Reduction Surveillance

Voluntary Surveillance Schemes

- Central Vascular Device Surveillance in Critical Care
- Lower caesarean Section Surgical Site Infection
- Prevalence Survey

Some of the measurable outcomes produced by targeted surveillance for which we have comparable data are summarised below.

a) Orthopaedic Surgical Site Infections (SSI)

Appendix 1 is an extract from the Orthopaedic SSI Report 2004, which compares the overall SSI rate and the pre-discharge SSI rates in different Trusts in Wales. There were no significant differences between Trusts within Wales in the rates of SSI for all mandatory procedures. Carmarthenshire NHS trust (identified as is number 25 within Appendix 2) had a 1.7% SSI rate. There was no significant difference between overall rates of SSI in Carmarthenshire Trust in 2003 and 2004.

b) *Clostridium difficile* (C diff) Surveillance

This scheme has become mandatory since January 2005. All stool specimens, submitted from patients over the age of 65 years are tested for *Clostridium difficile* toxin (antibiotic associated diarrhoea). Data from the new surveillance system for *C. difficile* in hospital inpatients aged over 65, will be made available to infection control teams in Wales via the Welsh Healthcare Associated Infection Programme reports. Appendix 2 illustrates the rates for Carmarthenshire NHS Trust between March 2004 and February 2005. Despite the increase in specimens submitted from October 2004 onwards, the percentage of positive isolates is lower than the previous year.

c) *S. aureus* Bacteraemia Surveillance

The *S. aureus* Surveillance scheme has been running since April 2001. Trusts are required to report all *S. aureus* isolates from blood cultures to the National Public Health Services for Wales (NPHSW). This includes Methicillin Resistant *S. aureus* (MRSA). MRSA Bacteraemias for Carmarthenshire NHS Trusts at the 31st March 2005 were 0.09 per 1,000 patient bed days. The all Wales rate at this time was 0.11 per 1,000 patient bed days. The Trust is currently below the mean rate in Wales. There has been a small reduction in the number of isolates over the previous two years from 24 isolates in 2003 to 20 isolates in 2004. The publicised data does not yet differentiate between Hospital & Community Acquired, thus caution is required when interpreting the data.

In November 2004 the Carmarthenshire NHS Trusts conducted a prevalence survey of Infection Rates. The survey was designed to assess the overall prevalence of infection in patients in our hospitals, together with their associated risk factors and sites of infection, using agreed definitions of infection. This study adopted an innovative approach to data collection through the involvement of the Trust's Link Nurses. Each Clinical Directorate granted protected time for the Link nurses to participate in the survey. Previous studies have been performed over a period of 3 to 4 months and the National Surveys took 15 months to complete, in Carmarthenshire the data was collected over a period of between 1 and 4.5 hours and the preliminary findings were available within 4 working days. Data was collected on every in-patient during the study period.

Table 1 compares the prevalence of Hospital Acquired Infections (HAI) and Community Acquired Infections (CAI) in Carmarthenshire NHS Trust in 2004 with the 1980 and 1994 UK National Surveys.

Table 1: Prevalence of Infection

Prevalence of Infection (%)			
	1980 National	1994 National	2004 Carmarthenshire
HAI	9.2	9.0	5.56
CAI	9.9	14.7	13.80

- Prevalence Rate in Carmarthenshire was lower than the average identified in the two previous National Prevalence Surveys.
- Annual Prevalence Surveys will enable the formation of Trend data, which will facilitate statistical comparisons for the Trust.
- The CAI rate was significantly higher than the HAI rate.

4.4.2 Audit

Clinical Audit provides an important tool to monitor the implementation of policies and operational performance. It can also provide insight into problems highlighted by surveillance.

The UK Audit tool commissioned by the Department of Health and further developed by the Infection Control Nurses Association was piloted in Carmarthenshire NHS Trust between September and December 2004. A report has subsequently been submitted to the Welsh Assembly Government and the tool has been adopted on a permanent basis for all Infection Control Audits carried out across the trusts.

Two unannounced single audits carried out across multiple areas within the Trust recently yielded the following scores:

- Patient Equipment Audit 85%
- Personal Protective Equipment Audit 86%

Using this database a score of 85% or above is considered to be Compliant with the standards. Anything below 85% is classified as partial compliance.

Carmarthenshire was the first Trust in Wales to implement the NPSA 'CleanYourHands' campaign. Improving hand hygiene will be key to delivering the national target to reduce HCAI's, including MRSA year-on-year. A recent audit following the launch of the campaign, revealed that hand hygiene compliance is 71%, this is significantly higher than the rates quoted in the literature⁶.

5.0 MEASURES TO ADDRESS INFECTION CONTROL ISSUES & MONITORING ARRANGEMENTS.

In order to ensure that all aspects of the Infection Control service are covered within this report, each issue will be discussed according to the delivery framework set out the Welsh Assembly Government document 'Health Care Associated Infections- A Strategy for Hospitals in Wales' (2004)¹.

The Carmarthenshire NHS Trust has developed its management action plan in response to the HCAI Strategy for Hospitals in Wales¹, using a performance-monitoring matrix - traffic light system. (Appendix 3). This format enables the Trust to monitor progress against each of the strategic objectives in an objective manner. This Trust wide document is supported by individual Directorate management action plans, which are to be monitored at

Directorate Clinical Governance Team meetings and at the Infection Control Committee Meetings (ICC). The remaining text will focus on those areas where further progress is required.

5.1 Infrastructure & Organisation

The Clinical Directors, supported by their Directorate Nurses are now accountable for infection Control and have been invited to become members of the Infection Control Committee (ICC). Each Directorate has developed a strategic and operational action plan.

Within Carmarthenshire NHS Trust we have developed a Link Nurse System. As the nurses are the ultimate practitioners of Infection Control procedures. it makes sense to involve them as teachers. Tutorials delivered by the link Nurses can reach all staff in the wards and since the Link Nurses remain at ward level she/he can continue to be a resource for education and to motivate compliance with policy. The Link Nurse system together with the Directorate Nursing Structures provides an excellent foundation to support the Clinical Directors lead role.

In addition each Directorate has granted protected time for their Link Nurses to participate in audit and surveillance activity on an ad hoc basis as the need arises.

5.2 Resources for Specialist Infection Control Support

The current staffing within the Infection Control Team does not include a Surveillance Co-ordinator. A business cases has been submitted for this resource and in the interim we are working closely with the Directorates and the NPHSW to ensure that the Mandatory requirements are achieved and local surveillance programmes are not compromised.

5.3 Facilities

It is essential to consider that patient case mix has changes over the years. The UK population is living longer and this more aged population are receiving more complex healthcare interventions. The healthcare delivery environment has also changed considerably over the last decade. Whilst prudent usage of antimicrobials is always encouraged as is compliance with Infection Control procedures e.g. Screening, and Hand Hygiene; attention is also being focused on the environment of care.

We are currently evaluating a new Micro fibre Cleaning technology in a bid to further improve standards of cleanliness and ultimately compliance with National Standards.

As discussed previously the Trust conducts an Annual Audit of Isolation facilities to monitor compliance with policies and assess the requirement for

isolation nursing. The Committee will note an improvement in compliance with requests for isolation over the last two years. In addition, following the publication of NHS Estates Isolation Survey the Trusts' risk Management Team are to conduct a formal risk assessment of our current facilities, the recommendations of which will be communicated to the Capital Planning Group.

5.4 Training and Education

The Infection Control Department has now developed a 'training database' copies of which are provided to Directorate Teams to indicate how many staff have received infection control training. We have also set a requirement within our action plan, which requires a minimum of 50% of staff, in the first instance, to have received infection control training within the previous 12 months. The Directorate targets are even more specific requiring a percentage of staff to have achieved a post registration qualification in infection control. In order to increase the percentage of staff receiving training it is anticipated that more teaching will take place in the clinical setting and Link Nurse teaching sessions will be recorded, progress against this indicator will be reviewed quarterly.

To facilitate this objective the Welsh Assembly Government is developing a new 'e-learning' training programme which NHS staff will be able to access.

5.5 Surveillance & Audit

5.5.1 Surveillance

The Carmarthenshire NHS Trust already participates in all mandatory surveillance schemes and a number of voluntary schemes. You will note from the Orthopaedic SSI report (Appendix 1) that post discharge surveillance was limited up until 2004. This is now being achieved by the Specialist Orthopaedic Nurses following patients up at home by telephone 3 months post procedure.

With reference to the *Clostridium difficile* Surveillance scheme the Trust has recently approved new Antibiotic guidelines, which will be subject to compliance audit in the future.

The Critical Care Directorate as part of their action plan have expressed an interest in Ventilator Associated Pneumonia (VAP) surveillance, with the aim of setting up a Task & Finish group to look at VAP Bundles. These have been promoted by the Institute for Healthcare improvement (IHI) '100,000 lives campaign'.

The Trust Prevalence Survey, is scheduled to be repeated in November 2005. The Welsh Healthcare Associated Infection Sub Group have also indicated that all Trusts will be required to participate in an All Wales Mandatory Prevalence Survey in the Spring of 2006. These surveys will enable us to identify secular trends in the epidemiology of infection within our hospitals.

5.6 Information Technology & Communication

The Trust is fortunate to have a NPHSW Computer Manager on site in Carmarthen. This enables us to extract data from 'Datastore'(laboratory IT System) to improve the effectiveness and efficiency of laboratory reporting for surveillance purposes. Appendix 2 is just one example of what can be produced using Datastore. The Infection Control Team is also exploring options for purchasing the 'ICNet' Surveillance software, which claims to be able to link in with the Patient Administrative System (PAS) and the laboratory Telepath system. This would significantly reduce the time taken to collect and present data.

6 WHAT MORE NEEDS TO BE DONE TO MINIMISE THE SPREAD OF INFECTION?

It is possible to deduce from the text above that much is being done to minimise the spread of infections within the Carmarthenshire NHS Trust. Yet it must be recognised that the problem is complex and multi faceted needing multi-disciplinary approaches.

Health Care Workers (HCWs) need to assume greater responsibility for Infection Prevention & Control and related risk reduction activities. A bottom up approach facilitated by senior managers with HCW informing, owning and championing these initiatives is the only way forward.

The media interest in MRSA has on the one hand raised the profile of Infection Prevention & Control, yet on the other hand it has heightened anxiety and focused

attention on just one (or a very limited number of) germs/organism with the exclusion of many others that can cause HCAI.

Finally it is recognised that there is a need to continue to improve access times for patients treatment. Therefore it is necessary to continue to develop, monitor and audit progress against agreed performance indicators for infection control as advised by the specialists.

Infection Control Team Carmarthenshire NHS Trusts

REFERENCES

- 1) August 2004: Welsh Assembly Government: "HAI-A Strategy for Hospitals in Wales
- 2) Feb 2000: National Audit Office Report by Comptroller & Auditor General. "The Management and Control of HAI in Acute NHS Trusts in England.
- 3) July 2004: NAO "Improving patient care by reducing the risks of HAI: A Progress report"
- 4) National Assembly for Wales (2001) Improving Health In Wales – A Plan for the NHS and it's partners.
- 5) 1985: Centres for Disease Control & Prevention. Hayley RW, culver DH et al. The efficacy of infection surveillance and control programs in preventing nosocomial infections in US hospitals. Am J. Epidemiology 1985;121:183-205
- 6) Didier Petitit (2004) Handwashing Compliance in the intensive care and emergency medical. From the 24th International Symposium.

GLOSSARY

HCAI:	Health care Acquired Infection
WAG	Welsh Assembly Government
NPSA:	National Patient Safety Agency
<i>S. aureus:</i>	<i>Staphylococcus aureus</i>
SSI:	Surgical Site infection
MRSA:	Methicillin Resistant <i>Staphylococcus aureus</i>
HAI:	Hospital Acquired Infection
CAI	Community Acquired Infection
NPHSW:	National Public health Service for Wales
ICC:	Infection Control Committee
VAP:	Ventilator Associated Pneumonia
IHI:	Institute for Healthcare Improvement
WHASIG:	Welsh Healthcare Associated Infection Sub-Group
PAS:	Patient Administration System
HCA	Health Care Worker

Appendix 1

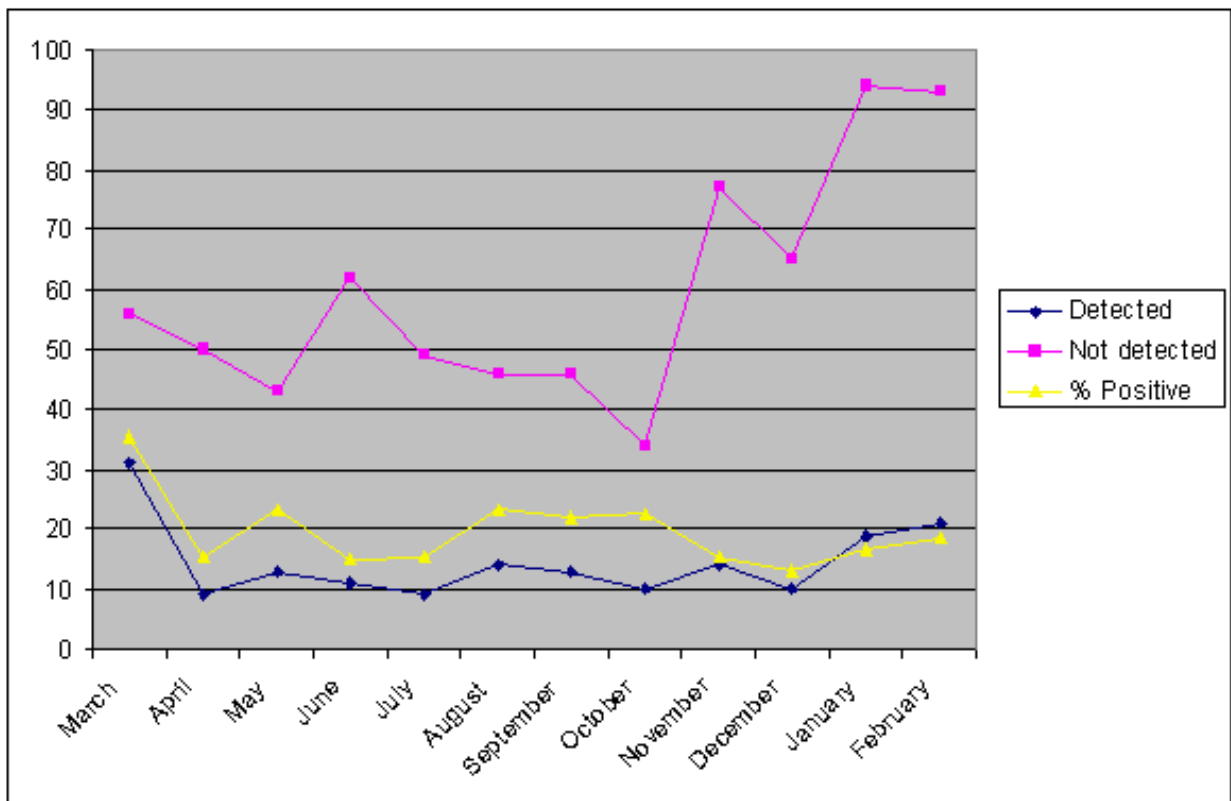
Incidence Of SSI And Pre-Discharge SSI Following All Mandatory Orthopaedic Procedures In Wales In 2004 By Trust

Trust	No. Procedures	% with post-discharge update	No. SSI	No. pre-discharge SSI	% SSI (95% CI)	% pre-discharge SSI (95% CI)
9	292	98%	14	5	4.8 (2.6-8.0)	1.7 (0.6-4.0)
10	25	24%	0	0	0	0
11	306	42%	10	4	3.3 (1.6-6.0)	1.3 (0.4-3.3)
25	117	13%	2	2	1.7 (0.2-6.2)	1.7 (0.2-6.2)
34	67	79%	2	0	3.0 (0.4-10.8)	0
38	235	0	6	6	2.6 (0.9-5.6)	2.6 (0.9-5.6)
39	169	64%	4	0	2.4 (0.6-6.1)	0

Please Note Carmarthenshire NHS Trust is identified as trust number 25 in this report.

Key Messages

- There were no significant differences between Trusts within Wales in the rates of SSI for all mandatory procedures.
- The pre-discharge rates for SSI in Wales are comparable to those reported for Scotland and Northern Ireland.
- There is no significant difference between overall rates of SSI in Carmarthenshire Trust in 2003 and 2004.

***Clostridium difficile* Isolates****Key Messages**

- Despite the increase in specimens submitted from October 2004 onwards (pink), the percentage of positive isolates (yellow) is lower than the previous year.
- Emphasis must be placed on the prudent prescription of antibiotics.

Appendix 3

Carmarthenshire NHS Trust Healthcare Associated Infection: A Strategy for Hospitals in Wales Management Action Plan.

		Sep-04	Feb-05	Sep-05						
Component	Indicator	Baseline Score	Score	Update Score	Action	By Whom/ By When	Monitoring	Scoring Criteria		
								Green	Amber	Red
National Standards	2(i) Trusts will comply with current Infection Control Standards			98% 2004	Compliance with: Welsh Risk Pool Standards: 14 Infection Control 23 Nutrition & Catering 30 Medical Equipment 35 Waste Management 36 Decontamination	CE & ICC Annually	WRP annual assessment HIW Inspections WHAISG Regional Office	Score achieved > 90%	Score achieved 75-90%	Score achieved <75%
	2(ii) WRP standards for Infection Control to be adapted by Health Inspectorate Wales			TBC	Await recommendations from HIW	WHAISG Ongoing		TBC	TBC	TBC
	2(iii) Build upon new National Standards of Cleanliness				Build upon the new National Standards for Cleanliness: National Standards of Cleanliness Performance assessment.	CE May 2005	Annual Report to Trust Board	Achieve compliance score of >80%	Achieve compliance score of >60%	Achieve compliance score of <60%

Delivery Framework	2(i) Trusts should review management arrangements to ensure clear lines of accountability			Clinical Directors now accountable for IC	Develop Management Action Plan and submit plan to NHS Regional Office by March 2005.	CE & Clin Directorates	Regional Office March 2005	Management Action Plan approved by Trust Board and Submitted	Management Action Plan compiled but not approved.	No Management Action Plan
	2(ii) Each Directorate to appoint a member to be formally accountable for infection control practice (clinical & non-clinical)			Clinical Directors now accountable for IC	Individual formally appointed within each Clinical Directorate	CE	Trust Board then WAG by March 2005	7 Individuals identified	5 Individuals identified	3 Individuals identified
	2(iii) Directorates to work with ICT to determine priorities for action.			Clinical Directors now accountable for IC	Conduct Prevalence Survey of HAI, Deliver training to enable those nominated individuals to develop Directorate based expertise in infection control.	Clinical Directors and Infection Control Specialist	Via Clinical Governance 3 year rolling programme and Balanced Score Card	Baseline data published and Directorate action plans agreed	Baseline data collected, but no Directorate action plans	No baseline data available
Resources for Specialist Infection Control Support	3(i) Provide updated recommendations on staffing and resources.				Await recommendations from WAG. Submit bid for additional ICN, Surveillance Nurse and ICD sessions via appropriate route.	WAG, CE - Sept 2005	Review of Trust Action plan by WHAISG - Sept 2005. Demonstrate links to Clinical Governance Development Plan	Appropriately resourced and educated Infection Control Team	Appropriately resourced Infection Control Team. Education to be completed.	Inappropriately resourced Infection Control Team.

	3(ii) Directorate based staff to become core members of the Trust's ICC				Monitor attendance at ICC	CE March 2005	WHAISG, CG Development Plan	Nominated individuals attend & ICC meetings 6 monthly and liaise with IC staff for strategic and operational issues.	Nominated individuals attend one ICC per annum.	Nominated individuals do not attend meetings.
Specialist Epidemiological Support	3(iii) Specialist epidemiological support will be available to Trust ICTs				NPHS to provide epidemiological expertise based in CDSC.	NPHS Wales	Infection Communicable Disease Service & WAG. Ongoing.	Support and advice available on request.	Advice available but no on site support.	No advice or support provided.
Facilities	3(iv) Patients will be treated in a physical environment that minimises the risk of infection.				Trust to conduct risk assessment of isolation facilities	WAG	Dec-05	Guidance provided and Capital Investment identified.	Survey evaluated and guidance in draft format.	No further information available.
					Trust to provide appropriate isolation facilities to meet their need.	CE	Annual through action plan review	Isolation requirements identified and work completed.	Isolation requirements identified and costed.	Unsure of actual requirement.
Training & Education	4(i) Effective training schemes will be available to meet the needs of all staff.	TBC		TBC	Obtain further information on introduction of new training programmes.	WAG 2006		TBC	TBC	TBC

					Continue to deliver in-house training programme & monitor attendance	ICT Ongoing		More than 50% staff have received infection control training	25-50% staff have received infection control training.	<25% staff have received infection control training.
Surveillance	5(i) Trusts will adopt comprehensive surveillance programme to monitor and direct infection control programmes.				Continue to participate in current mandatory surveillance schemes, extend surveillance activity as identified by WHAISG	CE & ICD C. diff 2004, ICU 2005.	WHAISG, Incident Reporting	All Directorates participate included in Perf Mgt Reviews.	All Directorates participate, no perf mgt.	Not all Directorates participate.
Audit	5(ii) Trust will adopt comprehensive audit programme to monitor and direct Infection control programmes.				Include as part of Trust wide audit programme.	CE Feb 2005	WHAISG	ICNA tool in use and report submitted to WAG	ICNA tool in use In-house reports produced.	ICNA tool not used.
Interventions and Performance Indicators	6(l) Reduction in Infection Rates will form part of Trust programmes and strategies.			Reduction reported 2005.	Trust to set & register annually with healthcare associated infection project team, local priority targets for measurable infection reduction.	CE Annual	NHS Regional Office WHAISG	Annual priorities identified and reduction achieved.	Annual priorities identified action implemented but no reduction.	Annual registration no action.
Information Technology & Communications	7(i) Trusts will develop systems to ensure effective data, and access to information sources appropriate to their needs.			Some equipment not yet received.	Consider needs of infection control in development of IM&T programme. Sufficient resources to provide ICT with specialist tools and software. ICNs to obtain access to datastore for surveillance purposes.	CE/ ICT Ongoing	NHS Regional Office WHAISG	Sufficient IT equipment available & utilized to improve efficiency.	Sufficient IT equipment purchased but training needs identified.	Insufficient IT equipment. Resulting in low productivity/efficiency.

