

CLOSTRIDIUM DIFFICILE - **RQIA INDEPENDENT REVIEW**

Protecting patients - reducing risks

**The Organisation and Management Arrangements for
the Prevention and Control of *Clostridium difficile* in
Northern Ireland**

May 2008

THE REGULATION AND QUALITY IMPROVEMENT AUTHORITY
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Table of Contents

1. Context
2. Background
3. Overview of findings
4. Governance
5. Infection Control
6. Laboratories and Services
7. Pharmacy and Antibiotic Management
8. Summary of recommendations

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1. Context

On 7 January 2008 the Northern Health and Social Care (HSC) Trust declared that there was an outbreak of *Clostridium difficile* associated disease within the Trust. The Trust had identified an increase in the number of cases, with increased mortality, over the previous period and cases had been diagnosed with the virulent ribotype 027. This ribotype had not been identified in Northern Ireland before 2007.

In February 2008, the Minister of Health, Social Services and Public Safety requested the Regulation and Quality Improvement Authority (RQIA) to undertake an independent review of the circumstances contributing to the rates of *Clostridium difficile* infection in the Northern HSC Trust in 2007 and early 2008.

The Terms of Reference of the Independent Review

- a) To review the circumstances contributing to the rates of *Clostridium difficile* infection in the Northern Trust in 2007 and 2008, including the recent outbreak.
- b) To review the Trust's management and clinical response to its *Clostridium difficile* rates and outbreak, including actions to inform patients, their relatives and the public.
- c) To review the Trust's arrangements to identify and notify cases, outbreaks and deaths associated with *Clostridium difficile* infection.
- d) To review the Trust's governance arrangements and the priority given to the prevention and control of infection.
- e) To review the actions of the Northern Health and Social Services Board and the DHSSPS in relation to the management of the outbreak in the Northern Trust, and actions by all Trusts, Boards and DHSSPS to reduce *Clostridium difficile* rates in Trusts.
- f) To examine any other relevant matters that emerge during the course of the review.
- g) To identify learning from the management of this incident and make recommendations for the Northern Trust and the wider HSC.

The terms of reference included a review of the actions of the Northern HSC Trust in relation to the management of the outbreak. This part of the review can only be undertaken by the RQIA once the outbreak had been contained. It is anticipated that the review of actions will be completed by the end of July 2008.

The Independent Review is being undertaken in two Phases, as set out below, to fulfil the Terms of Reference:

Phase 1: Part (i) Protecting Patients - outbreak containment

- Establish that all appropriate measures have been put in place to contain and manage the outbreak by the Northern HSC Trust.
- end of February 2008

Part (ii) Protecting Patients - reducing risk in Trusts

- Review the organisation and management arrangements for the prevention and control of *Clostridium difficile* in Northern Ireland (all Trusts).
- end of May 2008

Part (iii) Review of the outbreak in the Northern HSC Trust

- Following receipt of advice that the outbreak has been controlled, the Review Team will examine the:
 - a. Key governance arrangements within the Northern HSC Trust relating to control of infection;
 - b. Management of the outbreak including all actions taken to investigate and control it;
 - c. Key control measures that were put in place to control the outbreak.- end of July 2008

Phase 2: Progressing 'Changing the Culture'

- All Trusts and Boards will be reviewed by a dedicated specialist team to ensure that all systems and processes meet the requirements of 'Changing the Culture' and are sufficiently robust to ensure the safety of all patients.
- end of October 2008.

Phase 1, Part (i) Protecting Patients - outbreak containment was completed at the end of February 2008.

This Report focuses on **Phase 1, Part (ii)** of the Independent Review as identified above. The purpose, therefore, of this report is to advise the Minister on the current organisation and management arrangements for the prevention and control of *Clostridium difficile* in Northern Ireland.

All Health and Social Care Trusts have made good progress towards the implementation of effective control measures to reduce the risk of *Clostridium difficile* infections. However, no system can eliminate the possibility of an outbreak occurring in the future. Trusts now have the awareness and the knowledge to deal with this infection. They also have the understanding that they must have systems and processes in place to detect, manage and control such an event immediately it occurs to minimise the detrimental effects to patient care. All Trusts must ensure that these capabilities are sustained in the longer term and are expanded upon to include the reduction and prevention of all healthcare associated infections (HCAIs). Patient safety and the delivery of high quality care must be fundamental to a modern health

and social care service. Set out within this Report are recommendations for action to further reduce risks of outbreaks and to ensure effective control of such outbreaks when they do occur. The overall objective is to minimise the risk of *Clostridium difficile* and associated infections.

This Report is based on written information provided by the Trusts, discussions with Trust staff and, in addition, observations made by the Review Team during the validation visits to a sample of wards and departments in all of the Trusts.

2. Background

2.1 *Clostridium difficile*

Clostridium difficile is the major cause of antibiotic-associated diarrhoea and colitis, a healthcare associated intestinal infection that mostly affects elderly patients. It is an anaerobic bacterium (i.e. it does not grow in the presence of oxygen) and produces spores that can survive for a long time in the environment. Its usual habitat is the large intestine, where there is very little oxygen. It can be found in low numbers in a small proportion (less than 5%) of the healthy adult population. It is kept in check by the normal, 'good' bacterial population of the intestine.

Clostridium difficile can cause diarrhoea, ranging from a mild disturbance to a very severe illness with ulceration and bleeding from the colon (colitis) and, at worst, perforation of the intestine leading to peritonitis. It can be fatal. Generally, it is only able to flourish when the normal, healthy, intestinal bacteria have been killed off by antibiotics. When not held back by the normal bacteria, it multiplies in the intestine and produces two toxins (A and B) that damage the cells lining the intestine. The result is diarrhoea.

Patients who have been treated with broad spectrum antibiotics (those that affect a wide range of bacteria, including intestinal bacteria) are at greatest risk of *Clostridium difficile* infection. Most of those affected are elderly patients who may have a serious underlying illness. Most infections occur in hospitals (including community hospitals) and care homes, but they can also occur in patients living in the community.

Although *Clostridium difficile* may be carried by some healthy individuals, in most cases the disease develops after ingestion of the spore either through direct patient to patient contact, via healthcare staff, or via a contaminated environment. A patient who has *Clostridium difficile* diarrhoea excretes large numbers of the spores in their liquid faeces. These can contaminate the general environment around the patient's bed (including surfaces, keypads and equipment), toilet areas, sluices, commodes, bed pan washers and other patient contact areas. Spores can survive in the environment for a long time. They can be found in cluttered and dust prone areas and become a reservoir leading to hand-to-mouth transmission to other patients. If

these patients have also been given antibiotics, they are at risk of *Clostridium difficile* infection.

To confirm the diagnosis, a sample of diarrhoeal faeces is tested for the presence of the *Clostridium difficile* toxins. This is the main diagnostic test for detecting the infection in an individual patient and gives a result within a few hours. In outbreaks, or for surveillance of the different strains circulating in the population, *Clostridium difficile* can be cultured from faeces and the isolates sent to a Reference Laboratory for molecular testing and identifying susceptibility to antibiotics.

The molecular typing system analyses part of the *Clostridium difficile* DNA (chromosome) in a test called ribotyping. Over 100 different ribotypes have been identified. In 2003, ribotype 027 was associated with a major outbreak in Montreal, Canada. Individuals infected with this strain seemed to have severe disease, frequent relapses and increased mortality. Ribotype 027 was identified on two occasions in the United Kingdom prior to 2003. In 2005, ribotype 027 was associated with major outbreaks at Stoke Mandeville and Oldchurch Hospitals in England. In 2007, ribotype 027 was first reported in Northern Ireland by the Northern Health and Social Care Trust.

2.2 Minimising the Risks of *Clostridium difficile* and its effects

There are five key measures that organisations need to put in place and rigorously maintain in order to minimise the risks posed by *Clostridium difficile*:

1. **Rapid Isolation of a patient with diarrhoea** - to prevent the spread of infection to other patients and reduce environmental contamination;
2. **Enhanced environmental cleanliness** - to reduce the level of spore contamination of the environment and the likelihood of further transmission to other patients;
3. **Prudent antimicrobial prescribing** - to reduce the risk of destroying normal protective bowel flora and minimise the risk of *Clostridium difficile* infection;
4. **Scrupulous hand hygiene** - to prevent person-to-person transmission of spores;
5. **Personal protective equipment** - gloves and aprons for example – for good infection practice and protection of staff.

All of the above form the basis of a 'Care Bundle' approach to infection control and must be implemented and maintained to a very high standard at all times to ensure a safe system of care. No single measure is sufficient to minimise *Clostridium difficile* infections or control an outbreak - all of the above measures are required to ensure the delivery of a high quality safer service at all times. Their implementation should be achieved by appropriate education and training of all staff.

It is important that all Trusts work to the principle of 'zero tolerance' of *Clostridium difficile* which should be embedded in governance arrangements and reflected in the organisational culture from the Trust Board to the ward.

2.3 Protecting Patients – reducing risks in Trusts

Following the request from the Minister, the RQIA established an Independent Review Team, which included colleagues with specialist knowledge in the field of *Clostridium difficile* and healthcare associated infections. The work required to meet the Terms of Reference is being carried out in two phases. Phase 1, part (ii) of the review required the submission of a management and control of *Clostridium difficile* infection checklist by the Belfast, Southern, South Eastern and Western HSC Trusts. This checklist, although based on the Health Protection Agency (HPA) 'Good Practice guide to controlling *Clostridium difficile*', was modified to reflect health and social care delivery systems in Northern Ireland. The checklist sent to the Northern HSC Trust was further modified to ensure that it could provide reassurance that appropriate control measures had been instituted to contain the outbreak (Phase 1 Part (i)).

The Review Team then undertook visits to each Trust to validate their responses to the checklists. The validation visits were completed between March and May 2008. During each visit, Team members interviewed members of the Trust Board, Senior Managers, Infection Control staff and key clinical staff at ward and departmental level. Visits were made to selected hospital wards and departments and these included visits to different hospital sites within most Trusts.

3. Overview of Findings for Northern Ireland

The RQIA Independent Review Team appreciated that the five Trusts were established in April 2007 and are still working towards harmonising policies, procedures and practices inherited from legacy Trusts. The Review Team was reassured that the Trusts:

- recognise the need to give priority to actions to minimise healthcare associated infections (HCAIs) in general, and *Clostridium difficile* in particular;
- are all working to achieve the Ministerial target of an overall reduction in *Clostridium difficile* of 20% in hospital patients aged 65 and over by March 2009;
- have a programme of action to ensure that plans and procedures are in place, in line with recommended guidance for *Clostridium difficile* issued by the Chief Medical Officer and Chief Nursing Officer in April 2007 and also in accordance with the regional policy 'Changing the Culture'. The degree of implementation of plans differs between and within Trusts.

The Review Team considers that there is a deficiency in the number of staff in key disciplines that are essential to good infection control practice across Northern Ireland. In particular, the Review Team wishes to draw attention to an overall shortage in consultant medical microbiologists and in antimicrobial pharmacists. The level of provision of infection control nurses differs between Trusts and should be enhanced within a career progression structure including the development of Nurse Consultant posts. Consideration needs to be given to ensure adequate provision of clerical and data management staff and information technology support in infection control, microbiology and pharmacy.

Within and between each Trust there are wide varieties in the quality of hospital estate. High standards of infection control are difficult to achieve in old accommodation with limited isolation capacity. The Review Team has drawn the attention of individual Trusts to specific issues relevant to them in individual Trust reports. The Review Team did note the significant programme of estate improvement that is currently underway across Northern Ireland.

The collection, analysis and reporting of information are central to effective surveillance and control of HCAs. The availability of appropriate information technology, and support for this function varies across Northern Ireland. The Review Team is concerned that systems are not in place for hospitals to easily identify patients who have a history of *Clostridium difficile* infection during previous admission to other health and social care facilities.

The Review Team discussed plans for escalation arrangements in the event of an outbreak occurring of a more virulent strain of *Clostridium difficile*. Escalation policies are at different stages of development in the various Trusts.

The Review Team considers that additional guidance in relation to the establishment of isolation wards for *Clostridium difficile* and other infectious diseases would be of value across Northern Ireland. The Northern Trust has developed an isolation ward as part of its outbreak management; the design, operational policies and procedures could serve as useful examples for other Trusts. Trusts could develop their own model appropriate for local use and consider its wider role in managing other infectious diseases.

During the visits, the Review Team explored a number of key areas. The main issues that need to be considered are set out in the following sections. The recommendations outlined below have been addressed to some extent in individual Trusts. However, there is no uniform pattern of response across the region.

4. Governance

Good governance arrangements are essential for safe patient care and the future stability of any organisation. Responsibility for governance arrangements rests with the Trust Board through to the offices of the Chairperson and the Chief Executive.

The provision of clear, concise leadership, balanced with sound management capabilities is a prerequisite for a successful organisation. Striking the right balance between responding to immediate pressures, whilst allowing an organisation to mature and develop, requires special skills.

4.1 Strengths

In each of the five Trusts visited there was clear evidence that the Trust Boards and senior management teams are placing a high priority on infection control. Trusts are putting in place systems to ensure that there are effective 'Board-to-ward' governance mechanisms.

All Trusts have identified a Lead Executive Director for Infection Control who is committed to continuously improving infection prevention and control practice. This is the Medical Director in four of the Trusts. The Infection Control Leads reported that they had good access to, and support from, their Trust Board.

Chief Executives demonstrated personal commitment to improving infection control, and staff commented favourably on visits to clinical areas by Chairs and Chief Executives. All Trusts have systems in place to inform the Trust Board of significant infection control issues. Prevention and control of HCAs are increasingly linked to other Trust strategies on patient safety such as the Safer Patient Initiative.

4.2 Challenges

Harmonisation of policies and procedures - Trusts have inherited different policies and procedures from legacy Trusts and are working through processes to standardise arrangements across the new organisations.

Involvement of clinical consultant staff in infection control - Trusts recognise the importance of the involvement of consultant staff in infection control and are establishing mechanisms to achieve this. There is a need to have clear lines of responsibility and accountability at Clinical Directorate level.

Training of junior doctors - the pressure for space on induction and training programmes restricts time available for education in infection prevention and control and antimicrobial therapeutics.

Competing priorities - there are many strategic and operational pressures on senior teams within Trusts.

Managing an estate of varied quality - each Trust has inherited an estate ranging from facilities which are due for essential replacement to modern purpose-built facilities.

Providing adequate isolation capacity – all Trusts have hospital locations where there are inadequate facilities for the appropriate isolation of patients in single rooms.

Whilst the Northern Trust has made the most progress in this area, the other Trusts are in the process of establishing plans and procedures to set up isolation wards in the event of a *Clostridium difficile* outbreak.

Antibiotic management - Trusts are at varying stages in developing and implementing plans and systems in relation to the management of antibiotic prescribing.

Communication between hospitals and community based services - the Review Team was provided with examples that demonstrated a lack of systematic processes through which information about patients with *Clostridium difficile* is being effectively shared between different hospitals and between community and hospital services.

4.3 Recommendations for improvement

- REC 1 Consideration of Healthcare Associated Infection (HCAI) should be a standard item on each Trust Board agenda.
- REC 2 Regular (preferably weekly) visits by Chairs and Chief Executives to clinical areas should continue to focus on infection prevention and control.
- REC 3 Each Trust should identify 'clinical champions' at Consultant level to take forward action on HCAs and implement strategies to significantly reduce the current level of *Clostridium difficile*. 'Clinical champions' should be empowered to ensure that patient care pathways for *Clostridium difficile* are put in place and that arrangements are established for the multidisciplinary review of patients with *Clostridium difficile*.
- REC 4 Each Trust Board should receive reports on action taken to promote sound antibiotic stewardship across the Trust and on appropriate performance indicators.
- REC 5 Each Trust should have an agreed escalation plan to manage an outbreak of *Clostridium difficile* as part of its major incident procedures and this should address operational, logistical and resource issues.
- REC 6 Each Trust should review its single room capacity (with en suite facilities) for the prompt isolation of patients with symptoms of *Clostridium difficile*.
- REC 7 Regional guidance should be developed for effective communication about *Clostridium difficile* cases between hospitals, primary care practitioners and care homes. Systems should be established to ensure that information is available and guidance provided about treatment, including antibiotic prescribing, for patients who have a subsequent episode of *Clostridium difficile* and are admitted to a different facility.
- REC 8 Consultant involvement in the prevention of HCAs should be considered during consultant appraisal and job plan reviews. Trusts are encouraged to consider building in specific time for these activities in job planning.

- REC 9 A regional risk assessment should be carried out to identify any areas of hospital estate that have a high degree of risk in relation to the spread of infection. Agreed risk reduction plans should be developed to address these risks.
- REC 10 Organisations with responsibility for undergraduate and postgraduate medical education should review arrangements to ensure that the next generation of doctors develops competent, safe prescribing habits. The education system should be designed to provide a long-term foundation for good antibiotic stewardship. Consideration should be given to include a number of foundation year posts for junior doctors that provide exposure to infection control, medical microbiology and antimicrobial therapeutics.

5. Infection Control

Sound infection control structures with capable personnel receiving the right leadership from the Trust Board and providing the right leadership to the clinical and support teams are probably the most crucial components in the prevention and control of healthcare associated infections.

5.1 Strengths

The Review Team was impressed by the skill, enthusiasm and commitment of the infection control teams they met in each Trust. There was clear evidence of good team working facilitated, for example, by the co-location of infection control nurses with microbiology services. Good relationships exist between infection control and pharmacy teams and all medical microbiologists were held in high regard by clinical teams, particularly for their support and responsiveness to requests for advice and guidance.

The Review Team was provided with many examples of creative local initiatives in relation to infection control, although mechanisms to share best practice across and between Trusts could be further developed.

All Trusts report data to the Regional Surveillance system managed by the Communicable Disease Surveillance Centre (CDSC). CDSC has recently enhanced reporting arrangements with validated quarterly reports now being circulated six weeks after the end of the quarter to which they refer. Trusts are developing their own internal surveillance systems, for example through the appointment of surveillance officers to support infection control teams.

Trust staff reported good working relationships between Trust infection control teams and Consultants in Communicable Disease Control in Health Boards.

Trusts have established arrangements to have infection control links in clinical areas and are identifying ways to enhance these roles.

A process is underway to develop a regional manual for infection prevention and control.

5.2 Challenges

Availability of staff with specific infection control skills across the whole of the Trust - each Trust reported situations where there were skills / staff shortages, such as medical microbiologists, biomedical scientists, infection control nurses and antibiotic pharmacists. Staff shortages have restricted the ability of Trusts to provide on-site visits throughout different parts of the Trust, on-call systems and to roll out programmes such as the provision of antibiotic ward rounds to all clinical areas. The facilitation of HCAI training at ward level for nurses and doctors is also limited due to staff shortages. Where the Consultant Microbiologist is the Trust's Lead for Infection Control there are competing demands on their time.

Hospital estate - the Review Team visited facilities in each Trust that are not conducive to good infection control practice due to the age and design of the buildings. A particular recurring theme was limited en suite side room provision. Trusts need to consider appropriate contingency arrangements to ameliorate the current estate deficits.

Reporting systems - Trust infection control staff highlighted that there are different data requirements by different organisations for different purposes and this is leading to confusion and duplication of effort. There is a lack of staff both regionally (at CDSC) and in Trusts for the analysis and interpretation of data on infections.

Regional agreement on terminology - different Trusts are using terms such as 'cluster' and 'outbreak' in different ways.

Information Technology (IT) - the Review Team noted that there were different IT systems in different Trusts, and of variable effectiveness, to support infection control and laboratory services in respect of key alert organisms.

Root Cause Analysis (RCA) - Trusts demonstrated different levels of awareness of RCA and its use in relation to the investigation of adverse incidents and there was limited experience in applying this in a manner that is likely to change the culture with regard to *Clostridium difficile*.

Policy Implementation - infection control teams are actively engaged in challenging processes to harmonise policies from legacy Trusts and the implementation of new policies across all Trust areas.

5.3 Recommendations for improvement

REC 11 A review of training and development needs for infection control should be carried out across Northern Ireland.

- REC 12 A regional workforce plan and career structure for infection control should be developed and kept under review. The development of nurse consultant posts in infection control should be considered across the region.
- REC 13 Regional guidance should be developed on an agreed terminology for outbreak management and case severity in relation to *Clostridium difficile*.
- REC 14 All Trusts should reinforce guidance to clinical staff of the need to be aware of the clinical symptoms and signs associated with severe cases of *Clostridium difficile*. Identification of a patient with a severe pattern of illness may be the first indication of a more virulent strain of the disease.
- REC 15 All Trusts should have surveillance arrangements for *Clostridium difficile* in place which include systems for daily reporting of cases, trigger points for escalation, and monthly reports to Executive Teams and Trust Boards for consideration of further action. Staff with appropriate skills and dedicated time should be available for surveillance functions.
- REC 16 The project to develop a regional infection prevention and control manual should be completed as soon as possible. This will require a robust implementation programme and publicity to ensure effective communication across disciplines at all levels.
- REC 17 A regional policy for Root Cause Analysis (RCA) should be developed in respect of *Clostridium difficile*. It is recommended that RCA is carried out in all cases where *Clostridium difficile* is included in Part 1 (a, b or c) of death certificates and in a sample of those cases where it is included in Part 2. RCA should also be carried out whenever a 'cluster' or 'outbreak' of *Clostridium difficile* is reported. RCA must include the whole clinical and allied professional team. A regional training programme should be established on RCA for infection control staff. A system for sharing lessons learned between and across Trusts needs to be established.
- REC 18 Each Trust should establish an audit framework for infection control that ensures completion of audit cycles for:
- achievement of isolation within agreed timescales;
 - hand hygiene;
 - antibiotic guideline / policy compliance;
 - cleanliness;
 - mortality associated with *Clostridium difficile*;
 - death certification in relation to *Clostridium difficile*.
- REC 19 Trusts should consider reviewing their arrangements to ensure that the views of service users are informing infection control processes.
- REC 20 An agreed set of information should be determined which meets the needs of both regional and Trust surveillance of *Clostridium difficile* and for performance management, to avoid duplication of reporting.
- REC 21 A regional review should be carried out of IT systems to support surveillance arrangements for infection control in Trusts.

REC 22 Each Trust should review its arrangements for 24 hours per day, 7 days per week on-call cover for infection control and these arrangements should be shared with other Trusts and with on-call public health staff.

6. Laboratories

An efficient responsive laboratory system is an essential integral component of the safe management of clinical care and the prevention of HCAs.

6.1 Strengths

All Trusts have experienced, dedicated and motivated teams of laboratory staff who demonstrate strong commitment to the prevention and control of infections. The stability of this workforce has enhanced the provision of staff training and development and has strengthened engagement with staff at clinical level.

There are very effective working relationships between laboratory teams and infection control nurses. This is supported in those Trust areas where there is co-location of staff.

Laboratories have a strong emphasis on training and quality control and have been putting systems in place to ensure 7-day availability of toxin testing for *Clostridium difficile*.

6.2 Challenges

Workload and staffing - the level of consultant microbiology staffing is not sufficient to provide an adequate service in most Trusts - two of the five Trusts visited have a single consultant at present. This is totally inadequate for the level of work expected of them. The workload in all laboratories is increasing, with pressure on biomedical scientists and medical microbiologists.

Input to infection control activities - the current level of clinical capacity limits the ability to contribute to ward-based infection control activities such as antibiotic ward rounds.

Service design - Trusts have inherited patterns of laboratory services that, in some cases, do not facilitate the development and implementation of Trust-wide policies and procedures.

Quality of estate - the Review Team noted the very wide variety in the quality of laboratory premises.

Ribotyping - The pressure on laboratories in Great Britain is leading to delays in receiving ribotyping results for Northern Ireland.

6.3 Recommendations for improvement

REC 23 A regional workforce review should be undertaken to identify solutions within and between Trusts in the short and medium term to address current shortfalls in clinical microbiology, biomedical staffing and recruitment to vacant posts.

REC 24 Job planning for consultant microbiologists should build in time for specific functions including:

- adequate provision for on-call and cross cover and;
- multi-disciplinary ward rounds for *Clostridium difficile* cases;
- antimicrobial ward rounds;
- teaching and training of staff within the Trust;
- clinical audit.

Where the Consultant Microbiologist is also the Trust's Lead for Infection Control, the job plan should take account of the time and support needed for this function.

Note: The Review Team recognises that this will not be achieved across Northern Ireland until there is an enhancement of relevant staffing levels.

REC 25 IT arrangements for laboratories need to be reviewed to ensure that laboratory and infection control staff have better access to the information required to support their functions.

REC 26 Consideration should be given to the establishment of a regional microbiology network which includes the possibility of formal cross-cover arrangements between Trusts.

REC 27 Arrangements for Northern Ireland based assessment of ribotype strains of *Clostridium difficile* should be considered with specific consideration given to epidemiological investigations of 'unusual' strains.

REC 28 The level of specialist analytical staffing at the regional CDSC for HCAs should be reviewed in view of the increasing demands on this service.

7. Pharmacy

Antimicrobial stewardship programmes support the appropriate use of antimicrobials to effectively treat or prevent infection whilst minimising the risk of HCAs with *Clostridium difficile* and other multi-resistant micro organisms.

The four key components of an optimal antimicrobial stewardship programme are outlined below.

- **Expert advice**

- Medical microbiologist advice by telephone / pager with 24-hour access.

- Treatment guidelines including information about choice and dose of antimicrobials as well as typical duration of treatment, easily accessible in the clinical practice environment and up-to-date.
 - Treatment guidelines developed in close collaboration with key clinical stakeholders, informed by information on local pathogen epidemiology and antimicrobial resistance trends and promoting low-risk narrow-spectrum agents where possible.
 - Microbiology / infectious disease ward rounds to review patients with complex infection management problems.
 - Interpretive comments on microbiology laboratory result reports.
 - Ward pharmacists promoting awareness of and adherence to guidelines and policy.
- **Education, training and validation**
 - Training for medical, pharmacy and nursing staff on induction.
 - Annual training updates.
 - Competence assessment.
 - Electronic prescribing with integrated clinical decision support.
- **Governance**
 - Named individual accountable to Trust Board for improving the quality of antimicrobial prescribing and patient safety.
 - Routine reports to Trust Board of antimicrobial prescribing trends and audit findings.
 - Censored reporting of microbiology laboratory results.
 - Antimicrobial prescribing policy outlining principles of good prescribing and standards expected of prescribers.
 - Restrictions on prescribing of certain broad-spectrum antimicrobials.
- **Surveillance and assurance**
 - Routine monitoring of trends in antimicrobial use and feedback to prescribers and managers.
 - Annual or more frequent point prevalence audits of antimicrobial prescribing and feedback to prescribers and managers.
 - Audit of adherence to good prescribing policy (e.g. intravenous-to-oral switch, documentation, adherence to guidelines, prescribing of restricted antimicrobials) and feedback to prescribers and managers.

7.1 Strengths

All Trusts have strong, committed, pharmacy teams with good awareness of issues in relation to antibiotic prescribing.

The advice of pharmacists is welcomed by clinical staff and pharmacists are regarded as core members of infection control teams.

Antibiotic pharmacists, where available, are playing important roles in relation to ensuring arrangements for strong antibiotic stewardship are in place.

Creative aids are being developed to support antibiotic stewardship.

7.2 Challenges

Availability of pharmacy staff - in all Trusts visited, the Review Team noted that there was variable provision of antibiotic pharmacists and in the support of integrated medicines management. The pharmacist recruitment problems were generally attributed to the recent Agenda for Change banding outcome.

Harmonisation of antibiotic policies - action is taking place to develop and implement Trust-wide policies on antibiotic prescribing.

Antibiotic audits - Trusts are at different stages in the development of audit programmes to support action on antibiotic prescribing.

Information - information systems are not well developed to monitor overall trends in antibiotic prescribing across Trusts.

7.3 Recommendations for improvement

- REC 29 A region wide antibiotic prescribing policy for hospitals and community services should be developed to include arrangements for restrictive reporting of sensitivities on microbiology specimens. Facilities should be available to allow specialist variation when required. The prescribing policy should outline the principles of prudent prescribing and the required standards expected of prescribers.
- REC 30 Each Trust should have at least one specialist antibiotic pharmacist with protected time to undertake antimicrobial stewardship duties.
- REC 31 Each Trust should review provision of pharmacy support to wards and develop plans to ensure that an appropriate service is available across the Trust.
- REC 32 Systems for the monitoring of antibiotic prescribing trends should be available across the region with monitoring reports considered at Department, Commissioner and Trust levels in relation to regionally set targets. A programme of regular audit of adherence to the antimicrobial prescribing policy and any prescribing restrictions and guidelines should be implemented, led by clinicians in each speciality.
- REC 33 Local Trust experiences of using creative aids to support prudent antibiotic prescribing should be shared. This could be facilitated by the establishment of a forum for antibiotic management teams across Northern Ireland.

- REC 34 Trusts should nominate an individual accountable to the Trust Board with the responsibility for improving and monitoring antimicrobial prescribing.
- REC 35 Trusts should ensure that antimicrobial treatment guidelines are easily accessible in the clinical practice environment and regularly reviewed to promote prescribing of low-risk and narrow-spectrum agents, taking local epidemiology and resistance information into consideration.
- REC 36 Region wide implementation of e-learning should be used to effect the standardisation of post-graduate training in the principles of prudent and competent antibiotic prescribing for doctors and pharmacists.

8. Summary of recommendations

- REC 1 Consideration of Healthcare Associated Infection (HCAI) should be a standard item on each Trust Board agenda.
- REC 2 Regular (preferably weekly) visits by Chairs and Chief Executives to clinical areas should continue to focus on infection prevention and control.
- REC 3 Each Trust should identify 'clinical champions' at Consultant level to take forward action on HCAs and implement strategies to significantly reduce the current level of *Clostridium difficile*. 'Clinical champions' should be empowered to ensure that patient care pathways for *Clostridium difficile* are put in place and that arrangements are established for the multidisciplinary review of patients with *Clostridium difficile*.
- REC 4 Each Trust Board should receive reports on action taken to promote sound antibiotic stewardship across the Trust and on appropriate performance indicators.
- REC 5 Each Trust should have an agreed escalation plan to manage an outbreak of *Clostridium difficile* as part of its major incident procedures and this should address operational, logistical and resource issues.
- REC 6 Each Trust should review its single room capacity (with en suite facilities) for the prompt isolation of patients with symptoms of *Clostridium difficile*.
- REC 7 Regional guidance should be developed for effective communication about *Clostridium difficile* cases between hospitals, primary care practitioners and care homes. Systems should be established to ensure that information is available and guidance provided about treatment, including antibiotic prescribing, for patients who have a subsequent episode of *Clostridium difficile* and are admitted to a different facility.
- REC 8 Consultant involvement in the prevention of HCAs should be considered during consultant appraisal and job plan reviews. Trusts are encouraged to consider building in specific time for these activities in job planning.

- REC 9 A regional risk assessment should be carried out to identify any areas of hospital estate that have a high degree of risk in relation to the spread of infection. Agreed risk reduction plans should be developed to address these risks.
- REC 10 Organisations with responsibility for undergraduate and postgraduate medical education should review arrangements to ensure that the next generation of doctors develops competent, safe prescribing habits. The education system should be designed to provide a long-term foundation for good antibiotic stewardship. Consideration should be given to include a number of foundation year posts for junior doctors that provide exposure to infection control, medical microbiology and antimicrobial therapeutics.
- REC 11 A review of training and development needs for infection control should be carried out across Northern Ireland.
- REC 12 A regional workforce plan and career structure for infection control should be developed and kept under review. The development of nurse consultant posts in infection control should be considered across the region.
- REC 13 Regional guidance should be developed on an agreed terminology for outbreak management and case severity in relation to *Clostridium difficile*.
- REC 14 All Trusts should reinforce guidance to clinical staff of the need to be aware of the clinical symptoms and signs associated with severe cases of *Clostridium difficile*. Identification of a patient with a severe pattern of illness may be the first indication of a more virulent strain of the disease.
- REC 15 All Trusts should have surveillance arrangements for *Clostridium difficile* in place which include systems for daily reporting of cases, trigger points for escalation, and monthly reports to Executive Teams and Trust Boards for consideration of further action. Staff with appropriate skills and dedicated time should be available for surveillance functions.
- REC 16 The project to develop a regional infection prevention and control manual should be completed as soon as possible. This will require a robust implementation programme and publicity to ensure effective communication across disciplines at all levels.
- REC 17 A regional policy for Root Cause Analysis (RCA) should be developed in respect of *Clostridium difficile*. It is recommended that RCA is carried out in all cases where *Clostridium difficile* is included in Part 1 (a, b or c) of death certificates and in a sample of those cases where it is included in Part 2. RCA should also be carried out whenever a 'cluster' or 'outbreak' of *Clostridium difficile* is reported. RCA must include the whole clinical and allied professional team. A regional training programme should be established on RCA for infection control staff. A system for sharing lessons learned between and across Trusts needs to be established.
- REC 18 Each Trust should establish an audit framework for infection control that ensures completion of audit cycles for:

- achievement of isolation within agreed timescales;
- hand hygiene;
- antibiotic guideline / policy compliance;
- cleanliness;
- mortality associated with *Clostridium difficile*;
- death certification in relation to *Clostridium difficile*.

REC 19 Trusts should consider reviewing their arrangements to ensure that the views of service users are informing infection control processes.

REC 20 An agreed set of information should be determined which meets the needs of both regional and Trust surveillance of *Clostridium difficile* and for performance management, to avoid duplication of reporting.

REC 21 A regional review should be carried out of IT systems to support surveillance arrangements for infection control in Trusts.

REC 22 Each Trust should review its arrangements for 24 hours per day, 7 days per week on-call cover for infection control and these arrangements should be shared with other Trusts and with on-call public health staff.

REC 23 A regional workforce review should be undertaken to identify solutions within and between Trusts in the short and medium term to address current shortfalls in clinical microbiology, biomedical staffing and recruitment to vacant posts.

REC 24 Job planning for consultant microbiologists should build in time for specific functions including:

- adequate provision for on-call and cross cover and;
- multi-disciplinary ward rounds for *Clostridium difficile* cases;
- antimicrobial ward rounds;
- teaching and training of staff within the Trust;
- clinical audit.

Where the Consultant Microbiologist is also the Trust's Lead for Infection Control, the job plan should take account of the time and support needed for this function.

Note: The Review Team recognises that this will not be achieved across Northern Ireland until there is an enhancement of relevant staffing levels.

REC 25 IT arrangements for laboratories need to be reviewed to ensure that laboratory and infection control staff have better access to the information required to support their functions.

REC 26 Consideration should be given to the establishment of a regional microbiology network which includes the possibility of formal cross-cover arrangements between Trusts.

REC 27 Arrangements for Northern Ireland based assessment of ribotype strains of *Clostridium difficile* should be considered with specific consideration given to epidemiological investigations of 'unusual' strains.

- REC 28 The level of specialist analytical staffing at the regional CDSC for HCAs should be reviewed in view of the increasing demands on this service.
- REC 29 A region wide antibiotic prescribing policy for hospitals and community services should be developed to include arrangements for restrictive reporting of sensitivities on microbiology specimens. Facilities should be available to allow specialist variation when required. The prescribing policy should outline the principles of prudent prescribing and the required standards expected of prescribers.
- REC 30 Each Trust should have at least one specialist antibiotic pharmacist with protected time to undertake antimicrobial stewardship duties.
- REC 31 Each Trust should review provision of pharmacy support to wards and develop plans to ensure that an appropriate service is available across the Trust.
- REC 32 Systems for the monitoring of antibiotic prescribing trends should be available across the region with monitoring reports considered at Department, Commissioner and Trust levels in relation to regionally set targets. A programme of regular audit of adherence to the antimicrobial prescribing policy and any prescribing restrictions and guidelines should be implemented, led by clinicians in each speciality.
- REC 33 Local Trust experiences of using creative aids to support prudent antibiotic prescribing should be shared. This could be facilitated by the establishment of a forum for antibiotic management teams across Northern Ireland.
- REC 34 Trusts should nominate an individual accountable to the Trust Board with the responsibility for improving and monitoring antimicrobial prescribing.
- REC 35 Trusts should ensure that antimicrobial treatment guidelines are easily accessible in the clinical practice environment and regularly reviewed to promote prescribing of low-risk and narrow-spectrum agents, taking local epidemiology and resistance information into consideration.
- REC 36 Region wide implementation of e-learning should be used to effect the standardisation of post-graduate training in the principles of prudent and competent antibiotic prescribing for doctors and pharmacists.

Alice T Casey
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***Clostridium difficile* – RQIA Independent Review**