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# THE WATT GROUP REPORT

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A review of the outbreak of salmonella at the Victoria Infirmary, Glasgow, between December 2001 and January 2002 and lessons that may be learned by both the Victoria Infirmary and the wider NHS family in Scotland.



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## **PREFACE**

The outbreak of Salmonella infection in the Victoria Infirmary was a tragic episode for the patients who died and their relatives. It also had an impact on the Hospital and its staff. It is, therefore, particularly important to ensure that appropriate lessons are learned for the future both in the Hospital itself and in the wider NHS.

The Review identified a series of shortcomings at all levels. Some of these shortcomings were specific to the organisation concerned but many we believe could have been replicated throughout Scotland.

Some, but not all, of the failures and shortcomings that we detail have already been identified and remedial actions put in place. These are in addition to the recent initiatives relating to all aspects of hospital acquired infection (HAI) which will have important benefits in reducing HAI in the future.

The Review, and this Report, were team efforts. I would like to thank the members of the Review Group for their hard work, their professionalism and their support. If our recommendations help to reduce the risks of HAI and to improve the management of outbreaks in the future, some good will have come out of this sad episode.

**BRIAN WATT**

## SUMMARY OF RECOMMENDATIONS

1. *That Trusts should put in place structured audits of hand washing for all groups of staff, including medical, bank, agency and night staff.*
2. *That the cleaning specification in wards and departments should be set by the senior nurse responsible for the area and each ward/departmental manager in collaboration with the relevant Infection Control Team and Domestic Services Manager. Cleaning against this specification should be subject to rigorous monitoring and action to correct deficiencies. Failure to meet the specification should be subject to formal audit and review within each hospital and be subject to public disclosure.*
3. *That the ward/departmental manager should have unambiguous responsibility and be held accountable for all aspects of hygiene in their area. They must have commensurate authority, skills and resources (time and money) to discharge this responsibility.*
4. *That Audit Scotland reports are reviewed carefully by the management of Trusts, and that appropriate action is taken to respond to them.*
5. *That the Clinical Standards Board for Scotland ensures that there are reliable mechanisms in place to monitor compliance with its cleaning services standards.*
6. *That exposure of staff to faeces should be documented through the Incident Reporting Procedure as thoroughly as exposure to any other biological (body) fluids.*
7. *That specific guidelines and facilities (washing, showering, cleaning uniforms) should be available in every hospital for the decontamination of staff who become grossly contaminated from body fluids (blood, urine, faeces and so on).*
8. *That every Trust should have a staff uniform policy that ensures that:*
  - (a) *all staff uniforms are laundered by, or under the auspices of, the NHS;*
  - (b) *the widespread practice of staff travelling to and from work in (potentially contaminated) uniforms ceases; and*
  - (c) *adequate staff changing and decontamination facilities are provided.*
9. *That nursing notes/care plans should clearly reflect the need for enteric precautions in individuals suffering from loose stools /diarrhoea.*
10. *That nursing documentation should be improved so that key information and advice relating to infection control measures can be communicated to all relevant staff.*
11. *That clear infection control guidance to all staff on how to nurse a patient with loose stools/diarrhoea should be provided within the infection control manual.*

12. *That there should be careful consideration nationally on reducing the movement of patients between wards in hospitals so that the likelihood of outbreaks occurring is minimised and when they do occur they are contained within as defined a location as possible.*
13. *That a scientific meeting be organised at which experience and ideas relating to the specific infection control challenges of old buildings be shared and that following this the SEHD should issue guidance on the upgrading and maintenance of such buildings.*
14. *That Trusts ensure that levels of basic ward equipment (e.g., hoist slings, commodes) are sufficient to reduce the communal use of such equipment and reduce the risk of cross-contamination due to inadequate decontamination.*
15. *That Trusts develop policies which clearly identify the accountabilities of nursing and domestic staff in the cleaning of ward furniture and apparatus, including baths, food trolleys and "clinical" equipment and that clearly identify who has overall responsibility.*
16.
  - (a) *That the Scottish Executive Health Department should reinforce the good practice contained within the Scottish Health Facilities Note 30, "Infection Control in the built environment - design and planning," January 2002.*
  - (b) *That the NHS in Scotland develops, as a matter of urgency, standards relating to new builds and refurbishment projects incorporating, where necessary, the Scottish Health Facilities Note 30 guidance as best practice and requires Trusts to produce action plans for compliance with Note 30.*
17. *That control of an outbreak must include restriction of staff movement between wards and departments. When patients require infection control precautions to be implemented the nurses providing the care should, where possible, be the 'named nurse'. This should minimise the number of contacts of both the patient and the nurse. This may have implications for staffing of the ward but this will be temporary and not a high recurring cost.*
18. *That the Agency/Bank/Locum induction checklist should include explicit mention of Infection Control precautions in place.*
19. *That all Trusts should put in place assessments of the competencies of nursing staff in Infection Control and ensure that structured training programmes are established and the SEHD should consider with the Nursing Agency proprietors how competencies in Infection Control can be similarly assessed and delivered for Agency nurses. Similar training programmes should be put in place for medical and professions allied to medicine (PAM) staff.*
20. *That all staff at ward or department level who handle food should receive training in food hygiene commensurate with their duties and in compliance with the Food Safety (General Food Hygiene) Regulations 1995.*

21. *That appliances used for storing or preparing food (whether in the ward or elsewhere) should be subject to appropriate inspection and the results recorded.*
22.
  - (a) *That contacts with, and advice given by, any member of the ICT should be documented by both the individuals providing and receiving the advice. This is in addition to infection control care plans.*
  - (b) *That nursing documentation should be improved so that key instructions relating to infection control measures can be communicated to all relevant staff.*
23.
  - (a) *That an OCT should always be chaired by someone with competence and authority in health care associated infection. The local Consultant in Public Health Medicine (CPHM) should chair OCTs for major outbreaks (see Appendix E for definition). This demonstrates that the Team is led by an individual external to the Trust, who has close links with the local NHS Board and with community surveillance. In the case of other hospital outbreaks the CPHM should be consulted regarding chairmanship of the team. In practice, this will usually be the ICD.*
  - (b) *That there should be clear role definitions for the members of the OCT, with clear responsibilities documented.*
  - (c) *That a clear Outbreak Control Plan should be agreed and implemented.*
24. *That senior management (Executive Director level) of the Trust should be fully engaged from an early stage in managing outbreaks either as full and active members of the OCT or as a separate support team to the OCT. Senior management support should include a senior communications manager who can ensure that staff, relatives and the public are timeously informed of the outbreak and are given appropriate public health messages.*
25. *That all OCT reports should provide sufficient details of key factors in the spread of infection to allow proper audit.*
26. *That recommendation 10.22(a) and 10.22(b) of the Pennington Group Report (page 37) be extended to cover all outbreaks:*
  - (a) *"On completion of investigations, it should be the responsibility of the CPHM to provide SCIEH with a minimum data set (in the form of a standard proforma) "*
  - (b) *"For large (or otherwise significant) outbreaks a full written report should be completed and consideration given to its publication. Copies of written reports should be forwarded to SCIEH."*
27. *That an expert group be set up to give clear Scottish guidance on the role of staff screening in outbreaks of infection, so that such guidance can be used by OCTs in the future.*

28. *That in the case of an outbreak where non-invasive screening of relevant staff is deemed appropriate, Trusts should place a duty on all such staff to comply.*
29. *That Trusts take measures to improve the quality of clinical information on laboratory request forms.*
30. *That a classification system for infection outbreaks/episodes be drawn up and used by all key players as "common currency" in deciding the actions and communications required in a given infection incident (A framework (Infection Control Risk Matrix) is set out in detail in Appendix E) and that clear policies are developed, using this system, which identify all the key individuals involved in communications about outbreaks of different severity.*
31. *That in any outbreak that is considered at any stage to be foodborne, the Scottish Executive is informed in addition to the Food Standards Agency.*
32. *That Trusts and Boards ensure that there are sufficient resources to appoint adequate levels of communication professionals, but that "Press Office to Press Office" communication is additional to, not a substitute for, professional communication.*
33.
  - (a) *That the Chief Executive of a Trust or Health Board (depending on whether the outbreak is primarily in the hospital or community respectively) should assume the unambiguous responsibility for ensuring effective internal and external communications, including the media, appropriate Government Departments and Agencies.*
  - (b) *That within the SEHD consideration should be given to the nomination of an issue manager as soon as a serious outbreak occurs and irrespective of the route through which notification has come. Clear guidelines should also be in place on which Division/Unit within the SEHD should be responsible for actions and briefing associated with an outbreak.*
34. *That resources are in place to ensure that each Trust has a designated and trained ICD, who will normally lead the Trust ICT. This will usually, but not invariably, be a consultant microbiologist who will have designated sessions and a clearly defined job description for this component of their work. In the case of Trusts without laboratory facilities (e.g., Primary Care Trusts) they should formalise arrangements with a suitably trained and appropriately resourced individual.*
35. *That resources are in place to ensure that each Trust has sufficient ICN establishment to:*
  - (a) *have daily contact with wards or other health care premises;*
  - (b) *visit each facility at least weekly;*
  - (c) *provide advice to ward and departmental nursing staff on the nursing care of patients who are at risk of, or who have, infection;*

- (d) *be responsible for a systematic competency programme in infection control for all health care workers at their place of work (including medical, agency and bank staff);*
  - (e) *undertake systematic hand washing audits, including audits involving night and weekend health care workers; and*
  - (f) *provide an on-call service to advise on infection control matters on a 24-hour basis.*
36. *That there should be a lead Infection Control Nurse (ICN) in each Trust.*
37. *That infection control champions at ward level can complement, but not replace, the roles of the Infection Control Team. They should not be used as substitutes for ICNs but:*
- (a) *They should assist in the delivery of a comprehensive infection control service and be integral members of an enlarged Infection Control Team; and*
  - (b) *Have clearly defined roles, dedicated time for infection control duties and be appropriately trained and supervised. The extra responsibilities and training should attract enhancement of salaries.*
38. *That each Health Board should have an appropriately constituted Standing Infection Control Team (ICT) which:*
- (a) *takes the lead in strategic aspects of infection control in their area;*
  - (b) *formulates and agrees infection control policies;*
  - (c) *co-ordinates the management of all outbreaks where the Major Outbreak Plan is invoked;*
  - (d) *has a designated leader;*
  - (e) *links effectively with Risk Management Committees and Clinical Governance Committees; and*
  - (f) *provides assistance and advice to Trust ICTs when requested and/or when appropriate.*
39. *That large Trusts should have an appropriately constituted Standing Infection Control Team (ICT) which:*
- (a) *prevents and manages healthcare associated infection within their Trust;*
  - (b) *implements agreed Board and Trust policies in infection control;*
  - (c) *has a designated leader;*

- (d) *links effectively with Risk Management Committees and Clinical Governance Committees; and*
  - (e) *liaises closely with, co-operates with, and provides membership for the Health Board ICT.*
40. *That CPHMs (CD/EH) should be trained in the management of HAI and play a more prominent role in HAI surveillance and hospital outbreak management. They should normally lead all infection outbreaks within their Board where the Board's Major Outbreak Plan is invoked.*
  41. *That each Health Board holds regular (possibly every 2 years) simulated outbreak exercises, with adequate debriefing afterward, and that documentation of such exercises be provided to the Clinical Standards Board at the time of their inspections.*
  42.
    - (a) *That all relevant parts of the NHS operate to a consistent set of criteria that is linked to a risk management classification that describes infection outbreaks/episodes.*
    - (b) *That the level of outbreak/episode risk category determines both the level of action(s) required and the level of communications.*
  43. *That Trusts link infection control to risk management structures as a matter of urgency.*
  44. *That at both local and Scottish Executive level more strenuous efforts are made to tap the potential of the media to improve the public understanding of infection control issues. This will require a more open relationship to be developed between the NHS and the media based on mutual trust. There should be presumption of early disclosure to the public and the media of outbreaks of infection.*
  45. *That internal communications within and between the Scottish Executive and NHS organisations are improved and clarified so as to reflect the openness culture and this is emulated in communications with relevant agencies (e.g., The Food Standards Agency, Scottish Water, Scottish Environmental Protection Agency (SEPA)).*
  46.
    - (a) *That NHS Scotland should adopt a programme budgeting approach to Infection Control and that each Trust and each Board be required to provide details of the resources devoted to Infection Control.*
    - (b) *That such details are supplied as part of the documentation provided to the Clinical Standards Board for Scotland at the time of individual Trust reviews.*
  47. *That the Scottish Executive should convene a Working Group to develop methods of tracking and calculating the costs of HAI and its control in Scotland.*

## CHAPTER 1

### INTRODUCTION

Following the outbreak of salmonella in the Victoria Infirmary, Glasgow, a Group under the chairmanship of Dr Brian Watt was set up by the Scottish Executive to review the outbreak, with a remit to:

- (a) "Review the circumstances surrounding the onset of the outbreak of salmonella infection at the Victoria Infirmary, Glasgow, in December 2001 and January 2002 and identify the likely causal factors;
- (b) Assess the management of the outbreak and its effectiveness in reducing further exposure to the organism involved;
- (c) Assess how the NHS Trust managed the overall situation, including communications with other relevant organisations and the public; and
- (d) Draw conclusions and make recommendations to help reduce the risks of future outbreaks of infections of this kind in hospitals and help improve both outbreak and overall management."

The Group convened during May 2002 and met a wide range of individuals from all of the relevant organisations involved. As far as possible, the Group as a whole interviewed each individual. The Group also interviewed staff from the Scottish Executive; in these latter interviews no secretariat was present and members of the Group took notes. Membership of the Group is given in Appendix A and a list of individuals interviewed is given in Appendix B.

Where opinions are expressed on various issues covered in this report these are based on: interviews; professional opinion; the relevant guidance listed in Appendix D; and the review of a large series of relevant documents, some confidential. A full list of the non-confidential documents is given in Appendix C. Access to these documents can be obtained by contacting: **Mr John Brunton, the Scottish Executive Health Department, St Andrew's House, Regent Road, Edinburgh EH1 3DG, Tel: 0131 244 2868.**

#### **Fatal Accident Inquiry/Investigations by Health and Safety Executive**

At the time of writing the Report, decisions on whether to proceed to a Fatal Accident Inquiry had not been made. Also, an investigation by the Health and Safety Executive was continuing. The Group was given permission by the Procurator Fiscal to proceed with their review, and to receive a confidential briefing from the Health and Safety Executive to assist in their work. This briefing also informed the opinions of the Group.

#### **The Group's Approach to the Review**

From the beginning the Group worked on the basis of 3 principles:

- (1) The purpose of the Review was not to apportion individual blame, but to identify systematic shortcomings and to make recommendations;

- (2) The Review would not be a "white-wash"; where shortcomings were identified, these would be clearly outlined, irrespective of where they occurred; and
- (3) All comments made to the Group during the interviews would be non-attributable.

These principles were explained to each individual before their interviews.

The Group preserved patient confidentiality; the patients involved were known to the Group, and are referred to in this Report, by letters only.

At the request of the Group, the Trust wrote to the relatives of the bereaved patients giving them the opportunity to meet the Group if they wished.

### **Acknowledgements**

We are very grateful to all of those who took part in interviews. We are especially grateful to Dr Giles Edwards and Mrs Emily Simpson (Information Librarian, Royal College of Physicians, Edinburgh) for help with literature reviews.

We are very grateful to our Secretary, Mr John Brunton, for his clear minuting of the interviews, collation of documents and organisation of the administrative arrangements.

## CHAPTER 2

### THE SALMONELLA OUTBREAK IN THE VICTORIA INFIRMARY

#### Summary and Chronology

The Group, having read the Report of the Outbreak Control Team (OCT) agrees with the detailed facts of the outbreak given therein. These can be summarised as follows:

Salmonella species was isolated from Patient A (who had been admitted with diarrhoea on 27<sup>th</sup> December 2001) on 30<sup>th</sup> December 2001. This patient had been transferred to a medical ward before being transferred to a specialist unit in another hospital on that day.

Salmonella species was also isolated on 2<sup>nd</sup> January 2002 from Patient B, who had been in the same medical ward since 21<sup>st</sup> November 2001. This patient developed diarrhoea from 31<sup>st</sup> December 2001 and a faecal sample had been taken on that date.

Patient C, being nursed in the same ward in a bed next to Patient B, had had diarrhoea since admission on 16<sup>th</sup> November 2001 but became increasingly unwell. A stored faecal sample taken on 27<sup>th</sup> December 2001 tested for Salmonella spp. and reported positive on 3<sup>rd</sup> January 2002. A faecal sample taken on 10<sup>th</sup> December 2001 was negative.

3<sup>rd</sup> January 2002 - at this stage 3 patients from the same ward had been confirmed as having Salmonella spp.

On 7<sup>th</sup> January 2002, Salmonella species was isolated from Patient E, who had been a patient in the same ward since 27<sup>th</sup> December 2001 and had diarrhoea from 5<sup>th</sup> January 2002. [Stool samples from another patient, Patient D, who had been nursed next to Patients B and C but who was asymptomatic, were negative and this patient was not considered part of the outbreak.].

By 8<sup>th</sup> January 2002, the Salmonella Reference Laboratory reported as follows:

- Patient A - Salmonella enteritidis phage type 4.
- Patient B - Salmonella enteritidis phage type 21.
- Patient C - Salmonella enteritidis phage type 21.

[Thus Patient A was not part of the outbreak.]

At this time, the laboratory reported that they had received a report from the Reference Laboratory on 7<sup>th</sup> January 2002 that another patient, Patient F, who had been in the same ward from 21-23 December 2001, had Salmonella enteritidis phage type 21 present.

On 8<sup>th</sup> January 2002 Patients B and C died.

On 10<sup>th</sup> January 2002, the Salmonella species isolated from Patient E was also confirmed as Salmonella enteritidis phage type 21.

On 11<sup>th</sup> January 2002 Patient E died.

Salmonella species were isolated from a further 2 patients: from Patient G (faecal sample on 11<sup>th</sup> January 2002) and from Patient H (faecal sample on 18<sup>th</sup> January 2002). The organism was identified as Salmonella enteritidis phage type 21 on 15<sup>th</sup> January 2002 (Patient G) and 21<sup>st</sup> January 2002 (Patient H). Neither patient had been in the ward in which the other cases had occurred.

At this stage (23<sup>rd</sup> January 2002) the Outbreak Control Team (OCT) implemented faecal screening of staff. Two health care workers were found to have Salmonella enteritidis phage type 21.

After this time there were no further patients or staff identified with Salmonella enteritidis phage type 21.

### **Epidemiological Conclusions**

The views of the OCT are set out in their OCT Report and can be summarised as follows:

- Patient F was the likely source, having acquired Salmonella enteritidis in the community before admission to hospital.
- There was no evidence that hospital food caused the outbreak (one of the patients was being fed by tube only and there was no evidence of unusual levels of diarrhoea in patients or staff).
- Patients B, C and E acquired their infections by inadvertent transmission of the organism in the medical ward.
- There was no link between Patients G and H or with the other patients. Food histories from these patients indicated possible acquisition of the organism in the community. This was considered by the OCT to be the likeliest explanation on the balance of probabilities.
- The two health care workers identified as having Salmonella enteritidis phage type 21 on screening were not considered to be responsible for cross-infection but rather to have acquired the organism as a result of exposure to it in the course of their duties on the medical ward.
- The exact route(s) of cross-infection could not be identified.

The Review Group generally agrees with these conclusions, based as they are on the best evidence available and, where more than one possibility existed, on the balance of probability. However, the Group considers that person-to-person spread within another of the Hospital wards cannot be excluded as a factor in the latter two patients (G and H).

## CHAPTER 3

### NOSOCOMIAL OUTBREAKS OF SALMONELLA – BACKGROUND

This chapter is intended to provide background to the factors that contributed to the outbreak; it is not an extensive scientific review.

Salmonella species causing gastrointestinal infection in man are often derived from cattle or poultry in which they may be found as commensals in faeces. For infection to occur, the organisms must be ingested, usually through the faecal-oral route. In the main, infection is foodborne and occurs by ingestion of meat or animal products contaminated with these faecal salmonella. In a smaller proportion of outbreaks infection may occur due to person-to-person contact, either directly or indirectly via contamination of equipment or of a surface, which is then handled by a second person and the organism transferred to their mouth.

Ingestion of Salmonella spp. may produce:

- No effects (i.e. organisms destroyed by the digestive system);
- Replication within the gut and consequent faecal excretion without clinical symptoms (asymptomatic carriage);
- Replication within the gut and clinical (usually gastrointestinal) symptoms.

Both asymptomatic carriers and symptomatic patients can be a potential source of infection to others.

Salmonella spp. cause symptoms 6-72 hours (usually 12-36 hours) after ingestion.<sup>1</sup> The incubation period may be as long as 7 days. The illness is usually self limiting and short-lived but in a proportion of patients (usually at the extremes of life) the illness can be life threatening.<sup>2</sup>

Although it had long been assumed, on the basis of volunteer studies, that it was necessary to ingest large numbers of salmonella organisms to produce infection, a review of the subject<sup>3</sup> concluded both that such studies had their limitations (e.g., few tested low challenge doses) and that, in those foodborne outbreaks where the challenge dose had been calculated, the numbers of organisms could be as low as  $10^3$  or less. There also appears to be a clear dose-response relationship; ingested dose appears to be an important determinant of incubation period, symptoms and severity of disease.<sup>4,5</sup> All of these studies relate to foodborne infections; but it is reasonable to assume that these conclusions are also valid for person-to-person spread. There needs to be more detailed studies of non-foodborne nosocomial outbreaks of Salmonella infection to establish how person to person spread occurs and whether non-contact routes (e.g., aerosolisation of organisms) play any or a significant part. Such studies would be assisted by comprehensive surveillance of nosocomial outbreaks.

Salmonella spp. are grouped into serotypes (sometimes still referred to as species). The commonest serotypes are S.enteritidis and S.typhimurium. Although there has been a year-on-year reduction in the number of laboratory isolates of salmonella, S.enteritidis accounts for the majority of human isolates (see OCT report).

Strains of S.enteritidis and S.typhimurium can be subtyped by their susceptibility to a range of bacteriophages. The organism involved in this outbreak was Salmonella enteritidis phage

type 21, an uncommon phage type in Scotland (49 of 1,349 isolates in 1998), although, as in the rest of the UK, there has been a recent increase in frequency of isolation.<sup>2</sup>

Strains can be further subtyped using molecular techniques such as pulsed field gel electrophoresis (PFGE) and plasmid profiling, as well as antibiotic susceptibility testing. These methods may have considerable use in the investigation of outbreaks.

Salmonella spp. can cause outbreaks of infection in the community and in healthcare premises such as hospitals. Exact information on the role of salmonella in the community and in hospitals is difficult to obtain; laboratory based surveillance is believed to detect only a small proportion of cases in the community.<sup>6</sup> In any case most laboratory reports refer to individual patient isolates, rather than outbreaks.<sup>7</sup>

In a review of outbreaks of salmonella in hospitals in England and Wales over a 10 year period, Joseph and Palmer<sup>8</sup> showed that of 248 outbreaks, foodborne infection accounted for 57 (24%) outbreaks and presumed person-to-person spread for 70 (30%). No information was available for 107 (46%) of the outbreaks.

A more recent review<sup>9</sup> concluded that of 22 outbreaks in which Salmonella spp. were implicated, person-to-person spread accounted for 12, foodborne infection for 8 and in the other 2 the route of infection was unknown. Frequently person-to-person transmission is established by the exclusion of foodborne infection.

Although it is sometimes possible to establish the source of person-to-person spread in nosocomial salmonella outbreaks<sup>10</sup> in most outbreaks the exact source(s) cannot be determined. For example, careful investigation of a nosocomial outbreak due to S. enteritidis phage type 4, including the use of PFGE<sup>11</sup> established that person-to-person spread was the most likely cause, but failed to establish the source. The authors concluded that admission of a patient with an unrecognised community-acquired infection was the most likely source.

This was probably the case in an outbreak of nosocomial S. typhimurium infection in a Scottish hospital, which resulted in transmission of infection to 2 patients, 13 health care workers and a relative of one of the health care workers. The causative organism carried two independent drug resistance plasmids, which the authors concluded might have contributed to the virulence and transmissibility of the organism.<sup>12</sup>

## REFERENCES

1. Chin, J - Control of Communicable Diseases Manual, American Public Health Association, (17<sup>th</sup> Edition, 2000).
2. Edwards, G F – Personal Communication
3. Blaser, MJ, Newman, LS – A review of human salmonellosis: 1 Infective dose. Rev.Infect.Dis. 1982; 4: 1096-1105
4. Glynn, JR, Bradley, DJ – The relationship between infecting dose and severity of disease in reported outbreaks of salmonella infections. Epidemiol.Infect. 1992; 109: 371-388
5. Mintz, ED, Cartter, ML, Hadler, JL et al. 1994. Dose - response effects in an outbreak of Salmonella enteritidis. Epidemiol.Infect. 1994; 112: 13-23
6. Wheeler, JG, Sethi, D, Cowden, JM et al. - Study of infectious intestinal disease in England: notes in the community, presenting to general practice, and reported to national surveillance. Brit.Med.J. 1999; 318: 1046-1050
7. Cowden, JM, Well, PG, Adak, GK et al. - Outbreaks of foodborne infectious intestinal disease in England and Wales 1992-1993. Commun.Dis.Rep. 1995; 5: R109-117
8. Joseph, CA, Palmer, SR - Outbreaks of salmonella infection in hospitals in England and Wales 1978-87. Brit.Med.J. 1989; 298: 1161-1163
9. Wall, PG, Ryan, MJ, Ward, LR, et al. - Outbreaks of salmonellosis in hospitals in England and Wales 1992-1994. J.Hosp.Infect. 1996; 33: 181-190
10. Umasankar, EUM, Hannan, MM, Fry, CM et al. - An outbreak of Salmonella enteritidis in a maternity and neonatal intensive care unit. J.Hosp.Infect. 1996; 34: 117-122
11. Rushdy, AA, Wall, R, Seng, C et al. - Application of molecular methods to a nosocomial outbreak of Salmonella enteritidis phage type 4. J.Hosp.Infect. 1997; 36: 123-131
12. Edwards, GFS, Curran, E J, McCartney, AC et al. - Outbreak Forum - IV. Nosocomial salmonellosis. Commun. Dis. Rep 1993, 3: R40

## **CHAPTER 4**

### **ANTECEDENTS**

The Victoria Infirmary, built in 1893, is no longer fit for purpose as a busy general hospital. It has suffered from a prolonged period of uncertainty about its future with consequent planning blight and serious under-investment in the fabric of the building. The Hospital has faced a long-standing series of difficulties, well publicised in often hostile media coverage.

The above factors have had 2 consequences:

- (a) Difficulties in recruitment (30% shortfall of the nursing establishment in the medical unit where the outbreak occurred) with reliance on bank and agency staff to fill the gaps;
- (b) Lowering of morale and the development of a "siege" mentality in some Trust staff.

We recognise the wide array of competing pressures on the time, energy and focus of individuals, managers and on the resources of an NHS Trust, and also recognise the dedication of hard-pressed staff working in difficult conditions.

### **Causal and Associated Factors**

The exact route(s) of transmission within the ward cannot be established with certainty, but could be one or more of the following:

- (1) Patient-to-patient contact, either directly or via the environment or via staff;
- (2) Through inadequately decontaminated equipment and environment;
- (3) By contamination of food at ward level and subsequent storage at unsatisfactory temperatures.

### **Hand Washing**

There is evidence that before the outbreak there were insufficient hand washing facilities in the wards concerned and no audit evidence of compliance with hand washing guidelines. Compliance with hand washing guidelines is a problem throughout the NHS. The Group considers that there needs to be a "culture change" so that it is as unacceptable for health care workers not to comply with hand washing guidelines as it is for a surgeon to commence an operation without scrubbing up, or without using sterile instruments. Trusts should recognise the central importance of hand washing.

### **Recommendation**

1. *That Trusts should put in place structured audits of hand washing for all groups of staff, including medical, bank, agency and night staff.*

## **Cleaning**

The layout of the ward, especially the space between beds; the surface finishes; and state of the fabric, will have made it a challenge to clean effectively.

It is clear that there were widespread concerns about the quality and frequency of ward cleaning in the Victoria Infirmary before, during and after the outbreak. The contract specification is inadequate and ward staff have long complained about this. The contract is now the subject of renegotiation by the management of the Trust and the contractor.

There was a lack of clarity about who was responsible for the cleanliness of ward areas and a lack of regular audits. Although regular monitoring occurred, improvements were not effected.

The Group was concerned that in spite of these issues and of the recent Health and Safety Executive Report on the hospital, which expressed major concerns in relation to cleanliness, we were led to believe by the Trust that there were no serious issues arising from the recent assessment by Audit Scotland of the Trust's compliance with the Clinical Standards Board for Scotland's Healthcare Associated Infection (HAI) and Cleaning Services standards, and "A Clean Bill of Health: a review of domestic services in Scottish hospitals" published in April 2000.<sup>13</sup>

## **Recommendations**

2. *That the cleaning specification in wards and departments should be set by the senior nurse responsible for the area and each ward/departmental manager in collaboration with the relevant Infection Control Team and Domestic Services Manager. Cleaning against this specification should be subject to rigorous monitoring and action to correct deficiencies. Failure to meet the specification should be subject to formal audit and review within each hospital and be subject to public disclosure.*
3. *That the ward/departmental manager should have unambiguous responsibility and be held accountable for all aspects of hygiene in their area. They must have commensurate authority, skills and resources (time and money) to discharge this responsibility.*
4. *That Audit Scotland reports are reviewed carefully by the management of Trusts, and that appropriate action is taken to respond to them.*
5. *That the Clinical Standards Board for Scotland ensures that there are reliable mechanisms in place to monitor compliance with its cleaning services standards.*

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<sup>13</sup> Auditor General for Scotland. 'A Clean Bill of Health', a review of domestic services in Scottish hospitals, April 2000. (Audit Scotland)

## **Decontamination of Staff/Changing Facilities**

Although faecal contamination of staff was believed to have resulted in occupationally acquired salmonella infection, the Group was not provided with evidence that these incidents had been clearly documented and investigated. Also, there did not appear to be clear guidelines for decontamination of staff, nor for the treatment and laundering of soiled uniforms. It was clear that staff travelled to and from work in uniform and that many laundered their uniforms at home. The Trust's uniform policy was more of a dress code guideline. It did not give guidance as to how uniforms should be laundered, or whether a spare should be brought to work in case of a contamination incident, nor how uniforms should be treated in the event of such an incident. Staff changing facilities were inadequate and there was evidence of staff changing into clinical uniforms in the sluice room (classed as a "dirty" utility room) or domestic services room. Travelling to work in uniform and changing as described above are not positive symbols of good hygiene and will undermine public confidence.

### **Recommendations**

6. *That exposure of staff to faeces should be documented through the Incident Reporting Procedure as thoroughly as exposure to any other biological (body) fluids.*
7. *That specific guidelines and facilities (washing, showering, cleaning uniforms) should be available in every hospital for the decontamination of staff who become grossly contaminated from body fluids (blood, urine, faeces and so on).*
8. *That every Trust should have a staff uniform policy that ensures that:*
  - (a) *all staff uniforms are laundered by, or under the auspices of, the NHS;*
  - (b) *the widespread practice of staff travelling to and from work in (potentially contaminated) uniforms ceases; and*
  - (c) *adequate staff changing and decontamination facilities are provided.*

## **Nursing Documentation**

There was insufficient information about the excretions of patients so that it was unclear whether certain patients had diarrhoea at the time of admission or subsequently developed it. Guidance given to nursing staff by the Infection Control Staff was not readily documented within the nursing notes and there was no clear written guidance to all staff members that specific patients suffering from diarrhoea were to have enteric precautions implemented. There was failure to clearly document individuals having loose stools; the number of stools passed; and their consistency in the nursing notes. The first visible sign of enteric precaution documentation followed the diagnosis of Salmonella infection.

### **Recommendations**

9. *That nursing notes/care plans should clearly reflect the need for enteric precautions in individuals suffering from loose stools /diarrhoea.*

10. *That nursing documentation should be improved so that key information and advice relating to infection control measures can be communicated to all relevant staff.*
11. *That clear infection control guidance to all staff on how to nurse a patient with loose stools/diarrhoea should be provided within the infection control manual.*

### **Patient Movement**

The Hospital was extremely busy before and during the outbreak with considerable patient movement. It is a common practice in the NHS for patients to be moved from bed area to bed area and from ward to ward. Sometimes there are clinical reasons for this but it has also been actively pursued to increase efficiency in the throughput of patients: e.g., it is routine for patients to be admitted to an assessment ward, then to a specialty ward and to be moved again if beds are unavailable. They may also be transferred to a discharge lounge, another form of ward, before they eventually leave hospital. Although probably not relating directly to the patients concerned in the outbreak, the Group considers that this practice does carry serious disadvantages - it confuses patients and they feel there is no one person who is in full possession of the facts of their case; it increases workload and puts an extra burden on communication between patient and staff and between staff and staff. Crucially, it also places an added burden on the control of infection - greater cleaning and decontamination is required and facts about patients such as their bowel movements may be lost or misinterpreted.

### **Recommendation**

12. *That there should be careful consideration nationally on reducing the movement of patients between wards in hospitals so that the likelihood of outbreaks occurring is minimised and when they do occur they are contained within as defined a location as possible.*

### **Ward Environment**

The layout of the ward, cramped conditions, insufficient single rooms for isolation, paucity of storage facilities and the state of the fabric, were not conducive to compliance with Infection Control Guidelines. They were not, however, in themselves a reason for non-compliance; many hospitals in Scotland pose similar challenges.

### **Recommendation**

13. *That a scientific meeting be organised at which experience and ideas relating to the specific infection control challenges of old buildings be shared and that following this the SEHD should issue guidance on the upgrading and maintenance of such buildings.*

### **Ward Equipment**

The demarcation of nursing and domestic staff roles in cleaning ward equipment was not clearly understood by nursing or domestic staff. At interviews, there was a lack of clarity as

to who had overall responsibility. Also, the level of basic ward equipment, especially hoist slings and commodes in the ward concerned, was insufficient. This must have led to considerable communal sharing, putting greater strain on the decontamination process.

### **Recommendations**

14. *That Trusts ensure that levels of basic ward equipment (e.g., hoist slings, commodes) are sufficient to reduce the communal use of such equipment and reduce the risk of cross-contamination due to inadequate decontamination.*
15. *That Trusts develop policies which clearly identify the accountabilities of nursing and domestic staff in the cleaning of ward furniture and apparatus, including baths, food trolleys and "clinical" equipment and that clearly identify who has overall responsibility.*

### **Space Considerations**

Valiant attempts had been made to improve the Victorian layout of some wards (e.g., to give greater privacy and patient amenity) by changing their internal configuration. This applied to the wards affected by the outbreak. In doing so, however, it would appear that the distances between beds were reduced and patients were therefore in closer contact with one another than had applied previously. In addition, there was inadequate ancillary accommodation: clean and dirty utility rooms, staff changing rooms, domestic services areas and staff bases.

Overcrowding is a recognised factor in the causation of healthcare associated infections. Standards of ward accommodation (to reduce the likelihood of outbreaks of cross infection and to maximise their containment if they do occur) should be set nationally and be effected by a specific funding programme. These standards should include, amongst other things, sufficient hand washing facilities, en-suite toilet accommodation and clean preparation areas, segregation of domestic cleaning rooms and clean storage from dirty utility rooms.

The Scottish Health Facilities Note 30<sup>14</sup> should be used as a first point of reference on Infection Control on new builds and refurbishment projects. The Group fully supports this as a guide for best practice.

### **Recommendation**

16. (a) *That the Scottish Executive Health Department should reinforce the good practice contained within the Scottish Health Facilities Note 30, "Infection Control in the built environment - design and planning," January 2002.*
- (b) *That the NHS in Scotland develops, as a matter of urgency, standards relating to new builds and refurbishment projects incorporating, where necessary, the Scottish Health Facilities Note 30 guidance as best practice and requires Trusts to produce action plans for compliance with Note 30.*

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<sup>14</sup> Scottish Health Facilities Note 30, 'Infection control in the built environment – design and planning' January 2002, page 10. (Scottish Executive)

## **Vacancies and Agency/Bank Nursing Staff**

Nursing staff vacancies within the medical unit in which the outbreak took place were quoted to be 30% and it appears they were at this level before and during the outbreak. These vacancies were covered by agency and bank staff. This added to the numbers of staff passing through the wards. The Group is concerned both that infection control training of Agency staff may have been insufficient and that by increasing 'throughput' of staff there could have been an increased risk of cross infection.

There was also insufficient Infection Control Nurse cover, especially over the festive holiday period.

### **Recommendations**

17. *That control of an outbreak must include restriction of staff movement between wards and departments. When patients require infection control precautions to be implemented the nurses providing the care should, where possible, be the 'named nurse'. This should minimise the number of contacts of both the patient and the nurse. This may have implications for staffing of the ward but this will be temporary and not a high recurring cost.*
18. *That the Agency/Bank/Locum induction checklist should include explicit mention of Infection Control precautions in place.*
19. *That all Trusts should put in place assessments of the competencies of nursing staff in Infection Control and ensure that structured training programmes are established and the SEHD should consider with the Nursing Agency proprietors how competencies in Infection Control can be similarly assessed and delivered for Agency nurses. Similar training programmes should be put in place for medical and professions allied to medicine (PAM) staff.*

## **Handling of Food at Ward Level**

Although there was no clear evidence of this being a factor in the outbreak, the Group was concerned that:

- (a) The ward refrigerator was not kept at the correct temperature;
- (b) Ward staff received no formal training in food handling.

### **Recommendations**

20. *That all staff at ward or department level who handle food should receive training in food hygiene commensurate with their duties and in compliance with the Food Safety (General Food Hygiene) Regulations 1995.*
21. *That appliances used for storing or preparing food (whether in the ward or elsewhere) should be subject to appropriate inspection and the results recorded.*

## **Clinical Waste Disposal**

The Health and Safety Executive commented in detail in their report about concerns relating to clinical waste disposal. We endorse their findings and comments.

## CHAPTER 5

### MANAGEMENT OF THE OUTBREAK

#### **Initial Response**

The cases occurred over a festive holiday period and initial actions were undertaken by the Infection Control Doctor (ICD). However, it was not clear to the Review Group that these actions/instructions had been properly documented at ward level or carried out.

#### **Recommendation**

22. (a) *That contacts with, and advice given by, any member of the ICT should be documented by both the individuals providing and receiving the advice. This is in addition to infection control care plans.*
- (b) *That nursing documentation should be improved so that key instructions relating to infection control measures can be communicated to all relevant staff.*

#### **Infection Control Doctor**

The Group considered that while the individual performed well as Infection Control Doctor (ICD) during the outbreak, the role and accountability of the ICD in the Victoria Infirmary was poorly defined and no clear sessional commitments for this role were agreed or documented.

#### **Outbreak Control Team (OCT)**

Although three cases of salmonella infection had been identified in patients from the same ward by 3<sup>rd</sup> January 2002, an outbreak was not declared and the OCT was not established until 8<sup>th</sup> January 2002. Thereafter the OCT met regularly, but attendances were inconsistent, roles and responsibilities were not clearly defined and the OCT was chaired by three different individuals. To some extent this reflected the impact of media coverage and of the developing SRSV outbreak. Nevertheless there was a lack of clarity about who was responsible for the overall management of the Salmonella outbreak. The line of executive actions (taking decisions, committing resources, ensuring that actions were carried out) was also unclear. It appeared that management at Executive Director level within the Greater Glasgow NHS system were not fully engaged until late in the outbreak.

The Group believes that Infection Control needs to command a much higher order in the priorities of senior managers.

#### **Recommendations**

23. (a) *An OCT should always be chaired by someone with competence and authority in health care associated infection. The local Consultant in Public Health Medicine (CPHM) should chair OCTs for major outbreaks (see Appendix E for definition). This demonstrates that the Team is led by an individual external to the Trust, who has close links with the local NHS*

*Board and with community surveillance. In the case of other hospital outbreaks the CPHM should be consulted regarding chairmanship of the team. In practice, this will usually be the ICD.*

- (b) *That there should be clear role definitions for the members of the OCT, with clear responsibilities documented.*
  - (c) *That a clear Outbreak Control Plan should be agreed and implemented.*
24. *That senior management (Executive Director level) of the Trust should be fully engaged from an early stage in managing outbreaks either as full and active members of the OCT or as a separate support team to the OCT. Senior management support should include a senior communications manager who can ensure that staff, relatives and the public are timeously informed of the outbreak and are given appropriate public health messages. [See Chapter 6]*

## **OCT Report**

The report was well written and provided a clear account of the epidemiological, microbiological and environmental investigations and conclusions, as well as succinctly describing the management of the outbreak. It was in a format suitable for public dissemination. However, the Report did not document the fundamental aspects of the likely spread of infection, nor give details of key infection control issues relevant to the outbreak (e.g., hand washing, cleanliness, decontamination). As there was no "lessons learnt" section in the Report, this could prevent proper audit of remedial actions and lead to a belief amongst staff that there were few, if any, lessons to be learnt. There was some evidence of this belief from our interviews.

## **Recommendations**

- 25. *That all OCT reports should provide sufficient details of key factors in the spread of infection to allow proper audit.*
- 26. *That recommendation 10.22(a) and 10.22(b) of the Pennington Group Report<sup>15</sup> (page 37) be extended to cover all outbreaks:*
  - (a) *"On completion of investigations, it should be the responsibility of the CPHM to provide SCIEH with a minimum data set (in the form of a standard proforma) "*
  - (b) *"For large (or otherwise significant) outbreaks a full written report should be completed and consideration given to its publication. Copies of written reports should be forwarded to SCIEH."*

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<sup>15</sup> Pennington Group Report – 'Report on the circumstances leading to the 1996 outbreak of infection with E.coli 0157 in Central Scotland, the implications for food safety and the lessons to be learned.' (The Scottish Office, 1997)

## Staff Screening

The OCT changed its policy on staff screening in the middle of the outbreak, due to the further development of new cases, from one of no screening to one of screening of relevant staff. When screening commenced, it was on a voluntary basis and it was clear that a significant proportion of staff did not submit samples.

The Group was aware of the confusion surrounding guidelines on staff screening (and of the benefits of hindsight) but considered that earlier screening of staff might have defined the extent of the outbreak more clearly.

## Recommendations

27. *That an expert group be set up to give clear Scottish guidance on the role of staff screening in outbreaks of infection, so that such guidance can be used by OCTs in the future.*
28. *That in the case of an outbreak where non-invasive screening of relevant staff is deemed appropriate, Trusts should place a duty on all such staff to comply.*

## Major Outbreak Plan

At no point was the outbreak managed as a major or critical incident. There was little clarity about which guidance was followed by the OCT; initially local guidelines were followed and only very late in the outbreak did Greater Glasgow NHS Board guidelines come to the fore. The Review Team also heard evidence that although the NHS Board's Infection Control Guidelines (including an Outbreak Control Plan) were available, some Trusts in Greater Glasgow had developed their own guidelines without reference to those of the Board. **This issue is covered in more detail in Chapter 6 and our recommendations are set out there.**

## Infection Control Nurse (ICN) Support

Although we recognise that the Trust subsequently increased the number of ICNs to 4 WTEs, shared between the two major sites (Southern General Hospital and Victoria Infirmary) there was insufficient ICN support in the period leading up to the outbreak. The fact that there was only one WTE in post at the Trust at the time of the outbreak did not allow for delivery of a comprehensive, fully integrated, infection control service and proper monitoring of compliance with infection control guidelines.

Telephone guidance was available from 4<sup>th</sup> January 2002, and in person from 8<sup>th</sup> January 2002, but the Group found evidence that Infection Control advice was not properly documented in the nursing notes. The Group found no evidence of guidelines relating to the management of patients admitted with diarrhoea and vomiting.

The Group was concerned that, although ICN support has been increased since the outbreak, there was still no clarity about which individual was designated to provide ICN leadership and no clear evidence of plans for the future development of the service.

The Group believes that the present 9.00am to 5.00pm, 5 days a week, ICN service (with no telephone cover or public holiday cover) that exists in Scottish hospitals is inadequate to

provide a comprehensive infection control nursing service. **This is addressed in detail in Chapter 6.**

### **Microbiological Support**

The microbiology laboratory provided good support during the outbreak. However, it is unfortunate that the possible role of patient F in the outbreak was not considered until 8<sup>th</sup> January 2002 when delayed phage typing results from the Reference Laboratory became available, although a faecal sample was taken from the patient on 23<sup>rd</sup> December 2001.

The amount of clinical information given on several of the request forms was inadequate or absent; mention of changes in bowel habit might have alerted laboratory staff to the need for more extensive testing.

Inadequate clinical information on laboratory request forms is a common problem. Medical and nursing staff must be aware of the need for relevant and up-to-date clinical information.

### **Recommendation**

29. *That Trusts take measures to improve the quality of clinical information on laboratory request forms.*

## CHAPTER 6

### WIDER MANAGEMENT CONSIDERATIONS, INCLUDING COMMUNICATIONS AND OTHER KEY ISSUES

As has already been mentioned in Chapter 5, the Group considered that management at Executive Director level within the Greater Glasgow NHS system had not been fully engaged in the outbreak until shortly before the issue appeared in the media. A decision had been taken not to issue a press statement (although one had been prepared). The public was not informed of the circumstances and issues surrounding the outbreak until the relatives of one patient took their concerns to the media. An important means of communication and of transmission of a public health message was therefore lost. When the story broke, the Trust's perception of a hostile media became self-fulfilling.

Internally, communication with staff appeared to rely mainly on a verbal briefing system from 3<sup>rd</sup> January 2002 and regular ward visits by ICNs from 8<sup>th</sup> January onwards. There is some doubt, based on interviews, as to whether all staff would have received a full briefing on the progress of the outbreak or control measures to be implemented. The Group believes that one of the responsibilities of the OCT must be to ensure prompt and clear internal communication with all relevant staff.

The Group found that a series of communications failures had occurred at various stages between the OCT and the Scottish Executive, as well as within the Scottish Executive itself. These can be summarised as follows:

- (1) Although the Trust informed the Public Health Department on 3<sup>rd</sup> January, there appeared to be a delay in informing senior management of the Greater Glasgow NHS Board.
- (2) Delay and lack of clarity within Greater Glasgow NHS Board with no formalised policy for early warning of the Chief Executive and Director of Public Health by Consultants in Public Health Medicine. This resulted in the Chief Executive not being engaged in the outbreak until a week had elapsed.
- (3) Failure of the Trust OCT to inform the Scottish Executive although the SCIEH representative on the OCT had informed the Food Standards Agency; eventually information was requested from the Trust by the Scottish Executive when they learned of the press interest (neither SCIEH nor the FSA informed the SEHD).
- (4) Greater Glasgow NHS Board did not inform the Scottish Executive about the outbreak until information was requested of them.
- (5) The Scottish Executive only learned of the outbreak on 15<sup>th</sup> January 2002 when a copy of a press statement from the Trust (prepared in response to media enquiries) was sent to the Press Office at Greater Glasgow NHS Board. This was read over the phone to Press Health at the Scottish Executive. Later that day the Trust informed Press Health directly, because the Trust knew that a Glasgow newspaper would run with the story. Up to that point there had

been no direct communication from those involved in the outbreak with the Scottish Executive.

- (6) Although the Scottish Executive Press Office informed the Scottish Executive Public Health Division and Performance Management Division, no clear attribution of responsibilities existed.
- (7) Initial follow-up action was taken on 15<sup>th</sup> January 2002 by the Scottish Executive Public Health Team who made enquiries direct of the Public Health Department at Greater Glasgow NHS Board. Details of the outbreak were then e-mailed from Glasgow to the Public Health Team. However, no further follow-up action occurred by the SEHD until late on 16<sup>th</sup> January 2002 and early on 17<sup>th</sup> January 2002. The Minister for Health and Community Care was not, therefore, briefed until lunchtime on 17<sup>th</sup> January 2002, 9 days after the OCT was convened and just before local and national media released the story.

The common characteristics of these shortcomings were:

- (1) A lack of clarity about the circumstances in which details of an outbreak should be communicated to the Scottish Executive.
- (2) A similar confusion about which individuals should take the lead for such communication.
- (3) No clear internal communications policies within the organisations concerned.
- (4) Confusion about which Division/Unit within the Scottish Executive Health Department (SEHD) should take the lead in briefing the Health Minister and take necessary further actions.
- (5) A belief that "Press Office to Press Office" communication was a satisfactory and sufficient method of notifying key players about an outbreak of infection.
- (6) Reluctance to communicate with the public until forced to do so by external media enquiries, so that media pressures drove events.

### **Recommendations**

**The Review Team were concerned about these communications and wider management failures. We recommend the following:**

30. *That a classification system for infection outbreaks/episodes be drawn up and used by all key players as "common currency" in deciding the actions and communications required in a given infection incident (A framework (Infection Control Risk Matrix) is set out in detail in Appendix E), and that clear policies are developed, using this system, which identify all the key individuals involved in communications about outbreaks of different severity.*

31. *That in any outbreak that is considered at any stage to be foodborne, the Scottish Executive is informed in addition to the Food Standards Agency.*
32. *That Trusts and Boards ensure that there are sufficient resources to appoint adequate levels of communication professionals, but that "Press Office to Press Office" communication is additional to, not a substitute for, professional communication.*
33. (a) *That the Chief Executive of a Trust or Health Board (depending on whether the outbreak is primarily in the hospital or community respectively) should assume the unambiguous responsibility for ensuring effective internal and external communications, including the media, appropriate Government Departments and Agencies.*
- (b) *That within the SEHD consideration should be given to the nomination of an issue manager as soon as a serious outbreak occurs and irrespective of the route through which notification has come. Clear guidelines should also be in place on which Division/Unit within the SEHD should be responsible for actions and briefing associated with an outbreak.*

### **Other Issues**

In the course of the Review, the Group considered a series of other key issues that emerged as having wider implications for the control of HAI in Scotland. Recommendations to address these issues are given below.

#### **Infection Control Doctor**

The designated Infection Control Doctor (ICD) will be trained in and have a professional interest in infection control and management of HAI. They will have designated sessions for this work and would normally be appointed ICT leader at Trust level. They should agree and implement an infection control programme with all members of the ICT. They will normally chair OCTs at Trust level. They will report and be accountable for infection prevention and management through Trust Clinical Governance and Risk Management Committees. Training and resources will be required to bring this recommendation to fruition.

The Group believes that a more extensive level of ICD service is required if healthcare associated infection is to be kept to a minimum.

### **Recommendation**

34. *That resources are in place to ensure that each Trust has a designated and trained ICD, who will normally lead the Trust ICT. This will usually, but not invariably, be a consultant microbiologist who will have designated sessions and a clearly defined job description for this component of their work. In the case of Trusts without laboratory facilities (e.g., Primary Care Trusts) they should formalise arrangements with a suitably trained and appropriately resourced individual.*

## **Infection Control Nursing**

Infection control nurses (ICNs) are a key catalyst in preventing and managing infection in hospitals. At present, most Trusts have ICN support available on a 9am to 5pm, 5-day a week, basis that often excludes Public Holidays, as was the case in the Victoria Infirmary. Outwith these hours the ICD provides infection control clinical advice, usually by telephone.

By providing infection control training for all staff at induction and providing a systematic programme for all health care staff at place of work, ICNs can ensure that outbreaks are kept to the minimum. They should have daily contact with wards or other healthcare premises. They should visit each facility at least weekly. They should undertake the education of agency and bank staff as well as medical staff within a coherent programme of training and education. They should undertake, oversee and report on systematic audits of hand washing practice. They should have an on-call rota to advise on infection matters on a 24-hour basis. They will, along with the ICD, be central to management of outbreaks of infection.

### **Recommendations**

35. *That resources are in place to ensure that each Trust has sufficient ICN establishment to:*
- (a) *have daily contact with wards or other health care premises;*
  - (b) *visit each facility at least weekly;*
  - (c) *provide advice to ward and departmental nursing staff on the nursing care of patients who are at risk of, or who have, infection;*
  - (d) *be responsible for a systematic competency programme in infection control for all health care workers at their place of work (including medical, agency and bank staff);*
  - (e) *undertake systematic hand washing audits, including audits involving night and weekend health care workers; and*
  - (f) *provide an on-call service to advise on infection control matters on a 24-hour basis.*
36. *That there should be a lead Infection Control Nurse (ICN) in each Trust.*

### **Infection Control Champions**

The concept of infection control champions<sup>16</sup> announced by the Minister for Health and Community Care on 26 April 2002 is supported by the Group and should be developed.

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<sup>16</sup> Scottish Executive Press Release – 26 April 2002

## **Recommendation**

37. *That infection control champions at ward level can complement, but not replace, the roles of the Infection Control Team. They should not be used as substitutes for ICNs but:*
- (a) *They should assist in the delivery of a comprehensive infection control service and be integral members of an enlarged Infection Control Team; and*
  - (b) *Have clearly defined roles, dedicated time for infection control duties and be appropriately trained and supervised. The extra responsibilities and training should attract enhancement of salaries.*

## **Role of NHS Boards in Infection Control**

### **NHS Board Infection Control Team (ICT)**

The Group believes that NHS Boards should take the lead in the strategic aspects of infection control within their areas, including the formulation of policies.

The Group recommends that each NHS Board should have a standing ICT to co-ordinate the strategic management of all outbreaks where the Major Outbreak Plan is implemented. It will advise the NHS Board and the relevant Trust where infection control resources are needed and where protocols and procedures need to be improved to comply with current standards and requirements.<sup>17,18,19</sup> It will monitor compliance with recommended national guidance at Trust level. It will ensure that clinical governance and risk management committees are made aware of this advice. The NHS Board ICT will provide direct assistance to the Trust ICT when requested to do so.

The NHS Board ICT will have a designated leader, who is trained in infection control and who has the necessary skills to ensure that clinical governance requirements and CSBS standards are met in the prevention and management of infection. The core membership of the Infection Control Team at NHS Board level should include:

- Infection Control Doctor;
- CPHM (CD/EH);
- ICN/Public Health Nurse(s);
- Communicable Disease Administrator and Secretarial Support staff.

The Head of Environmental Health should also be a core member of the NHS Board ICT if a food-borne source of infection is suspected. For smaller NHS Boards (e.g., Forth Valley,

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<sup>17</sup> CSBS. Standards - Healthcare Associated Infection (HAI) Control, NHS Scotland, December 2001 (Clinical Standards Board)

<sup>18</sup> Scottish Office Department of Health Advisory Group on Infection. 'Scottish Infection Manual - guidance on core standards for the control of infection in hospitals, healthcare premises and at community interface.' 1998.

<sup>19</sup> Food Standards Agency/Scottish Executive Health Department. 'Guidance on the investigation and control of foodborne disease in Scotland' (Cairns Smith Report) 2002. (Food Standards Agency).

Highland, Borders, Dumfries & Galloway, Island Boards) the NHS Board ICT may function as the Trust's ICT also. The core membership is consistent with that set out in the Cairns-Smith Report.<sup>19</sup>

### **Recommendation**

**38. That each Health Board should have an appropriately constituted Standing Infection Control Team (ICT) which:**

- (a) takes the lead in strategic aspects of infection control in their area;**
- (b) formulates and agrees infection control policies;**
- (c) co-ordinates the management of all outbreaks where the Major Outbreak Plan is invoked;**
- (d) has a designated leader;**
- (e) links effectively with Risk Management Committees and Clinical Governance Committees; and**
- (f) provides assistance and advice to Trust ICTs when requested and/or when appropriate.**

A review of NHS Board and Trust functions in Scotland may necessitate some changes in infection control organisation and liaison in the future. The infrastructure suggested is, however, consistent with the Clinical Standards Board for Scotland recommendations and more recently the SCIEH commissioned report 'Model of Infection Control and Communicable Disease Control'.<sup>20</sup>

### **Trust Infection Control Teams**

In larger NHS Boards, Trusts will assemble their own ICTs. Membership will include:

- Infection Control Doctor;
- CPHM (CD/EH);
- ICNs;
- HAI Surveillance Project Manager and Secretarial Support Staff.

The Trust ICT will be responsible for the prevention and management of healthcare acquired infection within their Trust and will be responsible for ensuring appropriate infection control audits are completed. The Trust ICT will manage outbreaks until the Major Outbreak Plan is invoked or until clear transfer of responsibility is effected to the relevant NHS Board ICT.

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<sup>19</sup> Food Standards Agency/Scottish Executive Health Department. 'Guidance on the investigation and control of foodborne disease in Scotland' (Cairns Smith Report) 2002. (Food Standards Agency).

<sup>20</sup> Kennedy Business Development. Model of Infection Control and Communicable Disease Control (SCIEH/NHS Scotland, May 2002)

This transfer of responsibility should apply to complex or difficult outbreaks where the Major Outbreak Plan is not implemented. It should apply to outbreaks that cross two or more hospitals or Trusts. It should also apply when widespread transmission of infection to and from the community to hospital occurs.

The Trust ICT will appoint a team leader who is trained in and has a professional interest in infection control and who will agree to take responsibility for prevention and management of infection at Trust level. He/she will ensure that clinical governance requirements and Clinical Standards Board Scotland (CSBS) standards are met. The Team Leader would either be the Infection Control Doctor (ICD), or an Infection Control Nurse (ICN).

Comprehensive risk management arrangements will, however, have to be in place to ensure that advice and recommendations are appropriately considered and implemented by the Hospital and Trust management.

### **Recommendation**

39. *That large Trusts should have an appropriately constituted Standing Infection Control Team (ICT) which:*
- (a) *prevents and manages healthcare associated infection within their Trust;*
  - (b) *implements agreed Board and Trust policies in infection control;*
  - (c) *has a designated leader;*
  - (d) *links effectively with Risk Management Committees and Clinical Governance Committees; and*
  - (e) *liaises closely with, co-operates with, and provides membership for the Health Board ICT.*

### **Consultant in Public Health Medicine with Responsibility for Communicable Diseases [CPHM (CD/EH)]**

The CPHM (CD/EH) will become much more closely involved in ICTs at Health Board and at Trust levels. He/she will normally lead the ICT at Board level. CPHMs (CD/EH) should now be trained in the management of HAI and play a much more prominent role in HAI surveillance and management of hospital outbreaks.

### **Recommendation**

40. *That CPHMs (CD/EH) should be trained in the management of HAI and play a more prominent role in HAI surveillance and hospital outbreak management. They should normally lead all infection outbreaks within their Board where the Board's Major Outbreak Plan is invoked.*

## **Simulated Outbreaks**

At present, although Trusts and Boards hold simulated emergency exercises, these do not include simulated outbreaks of infection. The Group considered that this situation is unsatisfactory.

### **Recommendation**

- 41. *That each Health Board holds regular (possibly every 2 years) simulated outbreak exercises, with adequate debriefing afterward, and that documentation of such exercises be provided to the Clinical Standards Board at the time of their inspections.***

## **Classification of Outbreaks/Episodes and Linkage to Risk Management**

At present there is much confusion as to what constitutes an outbreak/episode and when an outbreak/episode is deemed "minor" or "major". There is no consistency of approach so that different health service agencies may operate to different (unwritten) criteria. There is also, in many cases, no linkage of outbreaks to more general risk management structures.

This leads to some of the management and communication problems shown in this outbreak.

### **Recommendations**

- 42. (a) *That all relevant parts of the NHS operate to a consistent set of criteria that is linked to a risk management classification that describes infection outbreaks/episodes.***
- (b) *That the level of outbreak/episode risk category determines both the level of action(s) required and the level of communications.***
- 43. *That Trusts link infection control to risk management structures as a matter of urgency.***

**An Infection Control Outbreak/Episode Risk Matrix is given in Appendix E.** The Group recognises that outbreaks/episodes develop quickly and that situations change from day to day; this should lead to a constant re-appraisal of the risk category of any outbreak/episode with re-assignment to a higher level as soon as deemed appropriate.

## **Relations with the Media**

There is a responsibility for the Scottish Executive and for the NHS to inform and educate the public about all aspects of health care infections. The media has a crucial role in this process. All too often this partnership fails; the media concentrates on raising concerns (and therefore raises public anxiety), there is poor internal communication between and within the organisations responsible for health care provision and externally with a perceived hostile media. The result, as in this case, is that there is both a lack of openness and a lack of context and balance in reporting. The public are made anxious about perceived secrecy relating to

infection incidents without receiving the necessary information to put these in context. Such negative media coverage may lead to:

- (a) Important information being withheld from the public; and
- (b) A “siege mentality”, with lowering of staff morale, recruitment problems and eventually a self-fulfilling prophecy of deteriorating health care.

More involvement of the media in positive aspects of infection issues would allow:

- (a) More openness; and
- (b) Better public understanding of infection issues (e.g., the limitations of staff screening, the relative risks of HAI as compared to risks of not receiving health care treatment).

### **Recommendations**

- 44. *That at both local and Scottish Executive level more strenuous efforts are made to tap the potential of the media to improve the public understanding of infection control issues. This will require a more open relationship to be developed between the NHS and the media based on mutual trust. There should be presumption of early disclosure to the public and the media of outbreaks of infection.*
- 45. *That internal communications within and between the Scottish Executive and NHS organisations are improved and clarified so as to reflect the openness culture and this is emulated in communications with relevant agencies (e.g., The Food Standards Agency, Scottish Water, Scottish Environmental Protection Agency (SEPA)).*

### **Resource Issues**

There is good evidence that resources put into infection control are cost effective in reducing the costs of HAI.<sup>21,22</sup> At present Trusts, as was the case in this outbreak, often do not have information on the costs of infection nor the costs of infection control.

It is important that infection control commands a much higher order in the resources devoted to it and that Trusts are adequately resourced for this. In the longer term, such resources should be related to the costs of HAI.

To ensure that properly staffed ICTs become a reality will require some resources for ICNs and ICDs. However, it is more important to ensure that there is a culture change within NHS Boards and Trusts to redesign current ways of working towards delivering the NHS Board and Trust agreed infection control programme. Training of staff for these new roles will be a *sine qua non* to implement these developments.

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<sup>21</sup> National Audit Office. ‘The Management and Control of Hospital Acquired Infection in Acute NHS Trusts in England’, House of Commons, 2000 (HMSO, London).

<sup>22</sup> Plowman R, Graves N, Griffin M, Roberts JA, Swan A, Cookson B et al. The socio-economic burden of hospital acquired infection. PHLS, London, 2000.

## **Recommendations**

46. (a) *That NHS Scotland should adopt a programme budgeting approach to Infection Control and that each Trust and each Board be required to provide details of the resources devoted to Infection Control.*
- (b) *That such details are supplied as part of the documentation provided to the Clinical Standards Board for Scotland at the time of individual Trust reviews.*
47. *That the Scottish Executive should convene a Working Group to develop methods of tracking and calculating the costs of HAI and its control in Scotland.*

## **Health and Safety Executive**

Health care associated infection is a patient and staff safety issue. We welcome the increasing profile of the HSE in this area, but would urge that inspections of health care premises are on a consistent basis. The Infection Incident Control Outbreak/Episode Risk Matrix should facilitate such a consistency of approach.

## CONCLUSIONS

The Group recognises that hindsight bestows a wisdom that is difficult to achieve when taking day to day decisions in a hard-pressed service. The Group also recognises the wide array of competing pressures on the time, energy and focus of individual managers and on the resources of an NHS Trust that is subject to scrutiny from a wide range of organisations such as the Health & Safety Executive, the Clinical Standards Board for Scotland and the Scottish Health Advisory Service. Nevertheless, hospital acquired infection (HAI) and its control differs significantly from other issues because:

- Infection not only affects an individual but it can, and too frequently does, transmit to others who rightly have an expectation that they will be protected from cross infection;
- There is a distinct and immediate public health implication and the public have an expectation that coherent advice to them will be forthcoming; and
- Even quite small outbreaks of cross infection will have an impact on health service provision, because more resources will be required and also (and of further concern to the public) there is likely to be temporary closure of services such as wards or whole hospitals.

This Report looks at, and comments on, a range of infection control issues that are pertinent throughout the NHS in Scotland. It also makes recommendations on various ways in which the NHS can help to combat HAI in Scottish hospitals. The major themes running through the Report can be summarised within five key areas and include:

- 1) A comprehensive implementation of Infection Control standards at ward/departmental level and the necessary resources to achieve this;**
- 2) A properly developed and funded infection control infrastructure;**
- 3) A culture change in hand washing, underpinned by hand washing audits for all staff;**
- 4) Implementation of a suggested Infection Control Outbreak/Episode Risk Matrix to allow consistent responses and communications across Scotland (Appendix E); and**
- 5) Proper emphasis on all aspects of communications in infection control and in outbreaks, including a culture of openness.**

The recommendations in this Report should help to ensure that the NHS in Scotland learns the lessons from the outbreak at the Victoria Infirmary and makes changes to minimise the chances of a similar episode occurring in the future. They should therefore be considered as a coherent whole and implemented as a whole.

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**LIST OF ALL NON-CONFIDENTIAL DOCUMENTS THAT INFORMED THIS REPORT**

**NHS Greater Glasgow**

Area Infection Control Committee - Infection Control Guidelines.

Communicable Diseases Within the Greater Glasgow Health Board Area: Outbreak Control Plan.

Report of Outbreak Control Team on the Outbreak of Salmonella Enteritidis Phage Type 21 in the Victoria Infirmary, Glasgow - January 2002.

**South Glasgow University Hospitals NHS Trust**

A CPD Strategy for Practice Development 2001-2004 - South Glasgow University Hospitals NHS Trust.

Directorate of Medicine for the Elderly - Preceptorship Programme for Registered Nurses.

South Glasgow University Hospitals NHS Trust - Nursing Auxiliary Competency Profile.

South Glasgow University Hospitals NHS Trust Formal Trust Management Group - Briefing Paper Re Nursing Manpower

South Glasgow University Hospitals NHS Trust - Nursing & Midwifery Strategy 1999-2002.

Southern General Hospital, Victoria Infirmary, Mansionhouse Unit, Mearnskirck House - Unqualified Staff Orientation Programme May 2002

**The Victoria Infirmary**

Scottish Health Management Efficiency Group - Domestic Services Part 1 - Victoria Infirmary - Bed and Day Room Areas.

Scottish Health Management Efficiency Group - Domestic Services Part 1: Victoria Infirmary - Laboratory and Pharmacy.

Victoria Infirmary - Care Plan for Possible/Confirmed Gastroenteritis.

Victoria Infirmary, Directorate of Medicine, Qualified Nurse Complimentary Orientation Directory.

Victoria Infirmary, Medical/Haematology - Ward A, Orientation Programme - Untrained Staff.

Victoria Infirmary -Ward 6/10, Acute Receiving Unit, General Orientation Information.

Victoria Infirmary - Ward A Orientation Package (Staff Nurse).

Victoria Infirmary High Dependency Unit - Staff Nurse Preceptorship/Education Programme.

**Other NHS Board Areas**

NHS Dumfries & Galloway Area Control of Infection Committee - Major Outbreak Plan.

Forth Valley Primary Care NHS Trust - Trust-Wide Incident Reporting and Investigation Guidance Document.

Forth Valley Primary Care NHS Trust - Trust-Wide Incident Reporting and Investigation Policy.

**Scottish Centre for Infection and Environmental Health**

Summary Information on General Outbreaks of Infectious Intestinal Disease Identified by SCIEH in 2001.

**Clinical Standards Board Scotland**

CSBS Healthcare Associated Infection - Cleaning Services - Self-Assessment Submission Forms.

**LIST OF GUIDANCE THAT INFORMED THIS REPORT**

Scottish Office Department of Health Advisory Group on Infection. 'Scottish Infection Manual - guidance on core standards for the control of infection in hospitals, healthcare premises and at community interface.' 1998.

Food Standards Agency/Scottish Executive Health Department. 'Guidance on the investigation and control of foodborne disease in Scotland' (Cairns Smith Report) 2002. (Food Standards Agency).

Ayliffe, GAJ, Fraiese, AP, Geddes, AM, Mitchell, K. 'Control of Hospital Infection - a practical handbook.' (Arnold, 4th Edition, 2000).

CSBS Standards – 'Healthcare Associated Infection (HAI) Control' - December 2001. (Clinical Standards Board).

CSBS Standards – 'Healthcare Associated Infection (HAI) – Cleaning Services' - June 2002. (Clinical Standards Board).

Auditor General for Scotland. 'A Clean Bill of Health', a review of domestic services in Scottish hospitals, April 2000. (Audit Scotland).

Scottish Health Facilities Note 30, 'Infection control in the built environment –design and planning' January 2002, page 10. (Scottish Executive)

Kennedy Business Development. 'Model of Infection Control and Communicable Disease Control.' (SCIEH/NHS Scotland, May 2002).

Food Safety (General Food Hygiene) Regulations 1995.

Pennington Group Report – 'Report on the circumstances leading to the 1996 outbreak of infection with E.coli 0157 in Central Scotland, the implications for food safety and the lessons to be learned.' (The Scottish Office, 1997).

National Audit Office. 'The Management and Control of Hospital Acquired Infection in Acute NHS Trusts in England' House of Commons, 2000 (HMSO, London).

## INFECTION CONTROL OUTBREAK/EPISODE RISK MATRIX

## APPENDIX E

An infection outbreak/episode (e.g., single case of rabies, Legionellae, Dentist/Doctor with confirmed Hepatitis B undertaking exposure prone procedures etc.) is difficult to incorporate into the existing AS/NZS 4360:1999 Risk Management Standard because although consequences of recurrence can be established it can be difficult to ascertain the likelihood of recurrence. The Infection Control Team will quantify the infection control risk criteria and ascertain the associated risk, which will determine the appropriate action to be taken.

Four infection risk categories can be identified: **Red** - High Risk      **Orange** - Moderate Risk      **Yellow** - Low Risk      **Green** - Very Low Risk

Criteria	Quantification Criteria	Risk Category	Action Required	Communications
3 or more met	Death and/or serious illness Major implications for public health Exceptional or unusual infection episode Major disruption of health and/or public services Major public anxiety and concern	Red - High Risk	Implement Area Major Outbreak Plan	<b>Full</b> (e.g., Trust, Health Board, SCIEH, FSA, SEHD) and others as appropriate (e.g., Local Authority, Water Authority, SEPA, HSE etc.)
1 or 2 met	Death and/or serious illness Major implications for public health Exceptional infection episode Major disruption of health and/or public services Major public anxiety and concern	Orange - Moderate Risk	Implement Trust Outbreak Plan - Full Outbreak Control Team	<b>Full</b> (e.g., Trust, Health Board, SCIEH, FSA, SEHD) and others as appropriate (e.g., local authority, water authority, SEPA, HSE etc.)
3 or more met	Serious illness and/or moderate infection episode and/or cases Moderate impact on public health Short-term disruption of health and/or public services Moderate public anxiety and concern	Yellow - Low Risk	Implement Trust Outbreak Plan - Infection Control Team	Trust and Health Board communications
All 4 met	Minimal infection episode and/or case Minimal impact on public health Minimal disruption of health and/or public services Minimal public anxiety and concern	Green - Very Low Risk	Implementation- Infection Control Team Investigation	Trust communications

N.B. Infection risk category coding may vary slightly from Trust to Trust. No more than four risk categories should apply to this infection control risk matrix.

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