



REPORT OF THE PUBLIC HEALTH LABORATORY SERVICE
VIRAL GASTRO ENTERITIS WORKING GROUP

Management of hospital outbreaks of gastro-enteritis due to small round structured viruses

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Summary: Small round structured viruses (SRSVs, Norwalk-like viruses, NLVs) are the most common cause of outbreaks of gastro-enteritis in hospitals and also cause outbreaks in other settings such as schools, hotels, nursing homes and cruise ships. Hospital outbreaks often lead to ward closure and major disruption in hospital activity. Outbreaks usually affect both patients and staff, sometimes with attack rates in excess of 50%. For this reason, staff shortages can be severe, particularly if several wards are involved at the same time. SRSVs may be spread by several routes: faecal-oral; vomiting/aerosols; food and water. Viruses may be introduced into the ward environment by any of these routes and then propagated by person-to-person spread. In an outbreak setting, the diagnosis can usually be made rapidly and confidently on clinical and epidemiological grounds, particularly if vomiting is a prominent symptom. By the time an SRSV outbreak has been recognized at ward level, most susceptible individuals will have been exposed to the virus and infection control efforts must prioritize the prevention of spread of infection to other clinical areas by containment of infected/exposed individuals (especially the prevention of patient and staff movements to other areas), hand-hygiene and effective environmental decontamination.

This report of the Public Health Laboratory Service Viral Gastro-enteritis Working Group reviews the epidemiology of outbreaks of infection due to SRSVs and makes recommendations for their management in the hospital setting. The basic principles which underpin these recommendations will also be applicable to the management of some community-based institutional outbreaks.

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Introduction

Within the general community, circulation of small round structured viruses (SRSVs) is common, causing sporadic cases and small clusters of gastro-enteritis. Large outbreaks occur frequently, partic-

ularly during the winter months and often in residential homes, nursing homes and hotels. In England and Wales, the number of cases of SRSV infection associated with outbreaks has increased during recent years, with the greatest burden of illness on the institutionalized elderly.¹ SRSV infection is associated with relatively mild and short-lived symptoms and affected individuals in the community rarely seek medical attention.

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However, outbreaks involving SRSVs among patients and staff in hospitals can have a significant effect on hospital activities.^{2–5} Hospital outbreaks involving SRSVs can lead to ward closures and sometimes hospital closures^{6,7} with a major impact on patient investigations, medical treatment and, potentially, hospital finances. This article briefly reviews our current knowledge of SRSVs and offers practical guidance on the management of such outbreaks within hospitals.

Historical perspectives

Several reviews of SRSV infection have been published in the last few years.^{8–10} The virus was first recognized from an outbreak of non-bacterial gastro-enteritis in a primary school in the town of Norwalk, Ohio, U.S.A., over 25 years ago.¹¹ Following the discovery and description of Norwalk virus, several groups of workers applied electron microscopy (EM) to the examination of stool samples. This resulted in a range of viruses being described from diarrhoeal samples, including rotaviruses, enteric adenoviruses (type 40/41), caliciviruses with typical morphology and astroviruses, mainly from children. In addition, viruses morphologically similar to the Norwalk agent were discovered in outbreaks of gastro-enteritis amongst adults. All these Norwalk-like viruses appeared spherical (32 to 35-nm in diameter) with a ragged edged morphology. In the U.K., and subsequently elsewhere, this particular group of morphologically identical viruses have been termed small round structured viruses (SRSVs) and belong in the family *Caliciviridae*. SRSVs are alternatively known as 'Norwalk-like viruses (NLVs)'; this nomenclature has been adopted by the Calicivirus Study Group of the International Committee on Taxonomy of Viruses, as an interim genus name. For the purposes of this report the term SRSV will be retained as it is in widespread use among healthcare workers in the U.K. This group of viruses is now generally accepted as the most important cause of epidemic non-bacterial gastro-enteritis in man and all share similar symptoms and clinical presentation.

Clinical epidemiology

Modes of transmission

SRSVs may be spread from person to person by the faecal–oral route¹² and by vomiting,^{7,13–15} probably by causing widespread aerosol dissemination

of virus particles, environmental contamination and subsequent indirect person-to-person spread (air–oral/mucous membrane spread). In some situations, particularly hospitals, transmission via vomiting may be more important than the established faecal–oral route of infection associated with other enteric pathogens. SRSVs can also be transmitted via contaminated water^{16,17} and food.^{18,19} Consumption of bivalve molluscs, especially raw oysters, has been the source in several food-borne outbreaks^{20,21} and this is related to filter feeding by these molluscs, which accumulate infectious virus particles from faecally contaminated water. More importantly, any food item can potentially transmit SRSVs if handled by an infected or contaminated food-handler (secondary foodborne spread). Cold foods such as salad and sandwiches are usually implicated in this setting and have been a source for several hospital outbreaks of SRSV gastro-enteritis.^{2,22}

Clinical features

Vomiting is the prominent symptom in SRSV-associated gastro-enteritis,^{7,23} but occasional clusters of cases occur where vomiting is infrequent or absent. Diarrhoea tends to be short-lived and less severe than with other causes of gastro-enteritis. Other symptoms include nausea, abdominal cramps, headache, myalgia, chills and fever.¹² Symptoms last between one and three days and recovery is usually rapid thereafter. SRSVs affect people of all age groups. It is recognized that SRSV infection results in short-term immunity only.

Criteria for suspecting an outbreak

SRSV outbreaks can often be diagnosed presumptively on clinical grounds from their characteristic epidemiological features²³ and the involvement of staff as well as patients. Outbreaks are often explosive in their onset with projectile vomiting a prominent feature. Attack rates may be very high, affecting more than 50% of ward patients.⁷ When an outbreak is suspected it is imperative to institute control measures immediately, without waiting for

Table 1 Criteria for suspecting an outbreak is due to SRSVs

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|---|
| 1. Vomiting (often projectile) in >50% of cases |
| 2. Duration of illness 12–60 h |
| 3. Incubation period of 15–48 h |
| 4. Staff and patients affected |
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virological confirmation (which is in any case achieved in less than half of typical outbreaks) and without waiting for results of bacterial cultures (Table I). Nevertheless, appropriate liaison with a virology laboratory may sometimes allow early definitive electron microscopic diagnosis from faeces specimens.

Control of hospital outbreaks

Categories of recommendation

The recommendations in this section are based on the categories used by the combined working party of the British Society of Antimicrobial Chemotherapy, the Hospital Infection Society and the Infection Control Nurses Association in the guidelines for the control of methicillin-resistant *Staphylococcus aureus*²⁴ as follows:

Category I: strongly recommended and strongly supported by well-designed experimental epidemiological studies.

Category II: strongly recommended and viewed as effective by experts in the field and by the working group, based on strong rationale and suggestive evidence, even though definitive studies may not have been done.

No Category: an unresolved issue as there is insufficient evidence or consensus regarding efficacy.

In principle, there are three points at which SRSV transmission may be controlled: the introduction of SRSVs into the hospital environment; containment measures at individual ward level; and measures to prevent the spread to other wards.²⁵

Introduction of SRSV into clinical areas

There is probably little that can be done to prevent the introduction of SRSVs into hospitals – the annual winter flurry of outbreaks is a regular feature on the infection control calendar. Onset of illness is rapid and there is no prodrome.²⁵ Patients referred to hospital with symptoms suggestive of SRSV infection, particularly if there is a household history of other cases, should be admitted directly to a side room until an alternative cause of vomiting is established. In the event of a ward outbreak, depending on bay and bed positioning, cohorting of affected patients may be feasible. Prompt cleaning and disinfection of areas contaminated by vomit and faeces should be undertaken (see below). An annual November memorandum from the infection control team to this effect may help to raise awareness at the right time of year.

However, it is essential for clinicians to appreciate that vomiting can be a feature of many serious illnesses and a fear of spreading SRSV should not jeopardize the appropriate management of those conditions in which vomiting is a non-specific feature.

Clearly, since foodborne outbreaks have occurred in hospitals, kitchen hygiene practices should be reviewed regularly and monitored. It should be borne in mind that outbreaks have been associated with pre-symptomatic, symptomatic and post-symptomatic food handlers^{26–28} and that viral shedding can also occur from asymptomatic, infected individuals.¹² This issue is particularly important when caring for ill relatives. Nevertheless the majority of SRSV introductions are likely to be due to the presence of affected patients, relatives or staff in clinical areas and are probably unavoidable.

If the characteristics of the outbreak suggest a point source, epidemiological investigations should be undertaken to identify or exclude a food or water source.²⁹ Although water-borne spread of SRSVs has not to date been implicated in hospital outbreaks of gastro-enteritis, the potential exists for water to act as a source following an interruption in or contamination of the supply with chlorination failure.

Control of transmission at ward level

SRSVs are readily transmitted and infection control measures at ward level must include adequate enteric precautions (Table II). Excretion of virus in faeces begins a few hours before the onset of symptoms and can continue for up to 7–10 days^{12,30} with maximum shedding occurring 24–72 h after exposure. Emphasis must be given to hand washing after contact with affected individuals and objects, before handling food or drink, and on leaving an affected clinical area. Gloves and apron should be used whenever contact with an affected patient or the contaminated environment is anticipated. There is currently no evidence to justify the use of masks for patients or staff and these are not recommended. Affected staff should be excluded from duty for 48 h after their last symptoms and should be excluded again if they subsequently relapse (an uncommon, but recognized feature of SRSV infection). Non-essential staff should be excluded from affected clinical areas and wards should be closed to admissions to prevent the introduction of further susceptible individuals. Unfortunately, by the time the outbreak has been recognized at ward level, it is

Table II Recommended control measures for SRSVs within affected clinical areas

1. Cohort nurse or isolate symptomatic individuals (Category II)
2. Wear gloves and apron for contact with an affected patient or environment (Category II)
3. Wash hands with soap and water after contact with an affected patient or environment, after removing gloves and apron (Category I)
4. Remove exposed food such as fruit (No Category)
5. Consider use of antiemetics for patients with vomiting (No Category)
6. Exclude affected staff from the ward immediately and until 48 h symptom-free (Category II)
7. Close the ward to prevent the introduction of new susceptibles. Avoid transfer to unaffected wards or departments (unless medically urgent and after consultation with infection control staff). The priority is to stop spread of the virus to other areas (Category II).
8. Exclude non-essential personnel from the ward (Category II)
9. Caution visitors and emphasize hand hygiene (Category II)
10. Clean and disinfect vomit and faeces spillages promptly: Appendix B (Category II)
11. Increase the frequency of routine ward, bathroom and toilet cleaning (Category II)
12. Use freshly prepared 0.1% (1000 ppm) hypochlorite to disinfect hard surfaces after cleaning (Category II)
13. The ward should not be re-opened until 72 h after the last new case and 72 h after uncontained vomiting and diarrhoea (Category II)
14. Thoroughly clean the ward and change the bed curtains before re-opening (Category II)
15. Clean carpets and soft furnishings with hot water and detergent, or steam clean. Vacuum cleaning is not recommended (No Category)

likely that the majority of susceptible patients and staff on duty will have been exposed to the infecting agent, particularly if vomiting is prominent.^{7,25} Minimizing the risk of transmission of infection by vomiting is problematical. The following measures may be useful and are recommended: removal of exposed food such as bowls of fruit²⁵; administration of antiemetics (such as metoclopramide) to symptomatic patients²⁵; and the rapid cleaning and disinfection of areas where vomiting has occurred.¹⁴

Prevention of spread to other areas

While it may be difficult to prevent spread at ward level, there is much that can be done to prevent spread to unaffected wards and other clinical areas. In one report of an outbreak in Australia, Russo and colleagues attributed transmission of infection to one ward, remote from the site of an initial outbreak, to staff movements between the wards.³¹ In another outbreak in Toronto, a 600-bed tertiary referral hospital was closed during a three-week outbreak, which affected 635 staff.⁶ This outbreak

Table III Recommendations for preventing spread of SRSVs to unaffected areas

1. Staff working in affected areas must not then work in unaffected areas of 48h (includes agency and bank staff) (Category II)
2. Avoid patient movements to unaffected areas (unless medically urgent and after consultation with infection control staff) and other institutions (Category II)

centred on the Emergency Department where there was an attack rate of 69% among the staff. Overcrowding in the department had led to patients being nursed for days on trolleys and hospital ward rounds were conducted there. The infection was disseminated to other wards and departments, presumably by staff movements. The spread of SRSVs between wards during an outbreak potentially can mean the difference between a small contained problem and a larger, hospital-wide outbreak with all its implications. This justifies the need for the rapid institution of stringent measures to contain the infection within an affected area.

For logistical reasons it may not always be possible to implement the following recommendations (Table III). During a large outbreak staffing shortages will be overwhelming and decisions will have to be taken by the infection control team, in consultation with managers, on a risk-management basis. Staff working on an affected ward should not work in unaffected areas for 48 h after the end of a shift. (This restriction does not apply to staff who have recently recovered from SRSV infection themselves and have returned to work). Essential medical and paramedical staff (such as physiotherapists) should, wherever possible, be dedicated to the affected ward(s) during an outbreak and not work in other areas. When this is not possible, affected wards should be visited after unaffected wards and staff should be reminded of the very sudden onset of vomiting typical of SRSV infection and the need to leave an unaffected area rapidly, if nausea arises while at work. Agency and bank nursing staff who are normally working on unaffected wards should not be used to cover single shifts on affected wards on an ad-hoc basis. If staff shortages require the use of outside staff, they should be booked to work for a block of several days or more to anticipate staffing requirements, even though this may result in early direct costs. Patient movements from affected to unaffected areas should also be restricted. If it is necessary on clinical grounds to transfer an individual to another ward, appropriate

isolation precautions should be taken on the receiving ward, following prior discussions with the infection control team. Patients may visit other departments (such as radiology) for clinically important investigations provided there has been prior notification and discussion to arrange suitable infection control precautions. Patient movements for non-essential activities or investigations should be cancelled or postponed. Patients in affected areas should not normally be discharged to other institutions, such as residential and nursing homes until 72 h after the last documented case, unless they have been affected and recovered from the illness. Non-essential visitors, especially children, should be discouraged or excluded.

Cleaning and disinfection

Prolonged outbreaks in ships and hotels suggest that SRSVs survive well in the environment. One report, in which two carpet fitters developed symptoms of gastro-enteritis after removing a contaminated carpet, suggests that the virus remains viable for at least 12 days and is not removed by vacuum cleaning.³² Following another typical ward outbreak, environmental contamination with SRSVs (determined by RT-PCR) correlated with the location on the ward of affected patients.³³ This provides some support for the rationale of attempting to cohort nurse patients on a ward during an outbreak. During repeated outbreaks on a cruise ship, illness was associated with sharing bathrooms and having a cabin mate who vomited.¹⁴ The authors concluded that contaminated communal bathrooms and environmental contamination were implicated in the transmission of infection. Subsequent outbreaks were prevented by repeated and thorough bathroom cleaning and rapid cleaning of contaminated rooms. Overcrowding in the Emergency Department, with a build up of soiled bedpans and dirty linen has been implicated in a hospital outbreak in Toronto.⁶ These reports all confirm the need for a comprehensive and responsive cleaning and disinfection programme during and at the end of an outbreak of gastro-enteritis. Particular attention should be given to cleaning objects that are frequently handled such as taps, door handles and toilet or bath rails. The timing of the terminal clean process should ideally be at least 72 h post resolution of the last case. This takes into account the period of maximal infectivity (48 h) plus the typical incubation period (24 h) for any newly infected

individuals. However, logistic pressures are often acute in hospital outbreaks and insisting on the return of formed stools from all patients is unrealistic. Terminal cleaning should not usually commence until at least 72 h post onset of the last case and 72 h since uncontrolled vomiting or diarrhoea, with contamination of the ward environment. The presence on the ward of patients with unformed but contained faeces (i.e., delivered directly into a toilet or bedpan) should not delay the start of terminal cleaning.

There is no direct evidence to support the use of particular agents for environmental disinfection as there is no viral culture system available for SRSVs. The related feline calicivirus is inactivated by heat at 60°C and by hypochlorite at 1000 ppm, but not by ethanol.³⁴ Based on this new evidence, albeit not directly applicable to SRSVs, the recommendations for using hypochlorite at 1000 ppm (Table II, Appendix A and B) differ from previous recommendations of 500 ppm.^{19,29} Hypochlorite is not generally recommended for disinfecting carpets and soft furnishings as prolonged contact is required and many such items are not bleach-resistant. Steam cleaning may be used for carpets and soft furnishings, provided they are heat tolerant (some modern carpets are 'bonded' to the underlying floor with heat sensitive materials). However, in-use tests with steam cleaners have shown failure to achieve temperatures of 60°C within carpets (Dr J. Cheesbrough, personal communication). Vacuum cleaning carpets and buffing floors during an outbreak have the potential to re-circulate SRSVs and are not recommended. Toys in paediatric wards should be capable of withstanding disinfection and this should be carried out on a daily basis. Recommendations for cleaning and disinfection of vomit and faeces, modified from those made by the Advisory Committee on the Microbiological Safety of Food Working Group on Foodborne Viral Infections,¹⁹ are given in Appendix B.

Communications

Communications are always important in the control of infections in hospitals and are particularly so during outbreaks. Wards should inform the infection control team immediately whenever there is a cluster (two or more cases) of unexplained vomiting or diarrhoea among patients or staff. This will allow rapid institution of control measures after assessment by the team. Other areas in the hospital

should be warned of the problem early so that all staff are vigilant and can give notice of spread of infection to new areas. This alert should extend to services such as radiology, physiotherapy, phlebotomy and portering where staff and patient movements can potentially allow rapid spread of infection to all areas of the hospital. The Occupational Health team should also be informed and may help to collect information about symptomatic staff (and encourage them to provide specimens). Since ward closures and staff shortages can be anticipated, managers must be updated at least daily during an outbreak to allow appropriate operational and manpower planning. Good communications with early institution of control measures at ward level during one outbreak contributed to a progressive reduction of cases in successive affected wards and containment of the infection within one area of a hospital.⁷ The consultant in communicable disease control (CCDC) should be informed where (a) more than one ward is affected or (b) the staffing of the hospital is compromised or (c) the operational capacity of the hospital is affected. All outbreaks should be reported to the Communicable Disease Surveillance Centre (CDSC), Central Public Health Laboratory, Colindale, as a matter of course. Education and information should be provided for staff, patients and visitors during an outbreak as handouts and as ward door posters. These should provide a brief explanation of the nature of the illness, routes of transmission and basic infection control precautions. Examples of information sheets (used at Salford Royal Hospitals NHS Trust) for staff and patients are given in Appendix A.

Laboratory diagnosis

The original Norwalk virus was detected by electron microscopy and this methodology remains the first line diagnostic method for SRSVs. Unformed faecal specimens (not formed stools or vomitus) should be collected from symptomatic individuals within three days of the onset of symptoms.³⁵ EM has been fundamental in providing surveillance data about this group of viruses. However, even under ideal conditions (i.e., examining faecal samples collected within 48 h from symptomatic patients) less than 50% of samples will be positive for SRSVs by EM. EM is a rapid, but relatively insensitive diagnostic method, which requires individual specimen examination. In addition, diagnostic EM units are generally available only in large microbiology centres because of the expensive nature of this

Table IV Policy for electron microscopy examination of specimens in suspected outbreaks of gastro-enteritis (PHLS North West)³⁵

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1. Only unformed faecal specimens from symptomatic individuals within three days of onset should be referred for examination
 2. An initial batch of up to six specimens will be examined
 3. A further batch of four specimens will be examined if less than two are positive
 4. Not all specimens from an outbreak will necessarily be examined
 5. New cases on a different ward will be regarded as a potentially distinct outbreak
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technique and the requirement to maximize its use. Some centralized EM centres now carefully select specimens from outbreaks to give an efficient diagnostic service and to limit the number of specimens that need to be examined (Table IV).³⁵ This means that not all specimens available from an outbreak will be examined. However, if several wards are involved, each should be treated as a potentially separate outbreak until the microbiology and EM results are available.

In recent years molecular techniques have succeeded in producing complete genome sequence data for several SRSVs³⁶ and partial sequence data from many other strains. This has allowed the application of reverse transcription polymerase chain reaction (RT-PCR) methodology both for epidemiological study and diagnosis of SRSVs.^{17,33,37-41} The added sensitivity of RT-PCR over EM is likely to extend the diagnostic window beyond 48 h. However, RT-PCR is not yet a routine diagnostic method because not all strains can be amplified in the currently described assays. A reference RT-PCR service is available in the U.K. from the Central Public Health Laboratory, Colindale and from Bristol Public Health Laboratory. It is likely that in the near future, RT-PCR will become widely available and by using molecular methods to produce recombinant capsid proteins and specific monoclonal or polyclonal antibodies, it is anticipated that immunoassays will also be developed. These will be more sensitive, faster and cheaper than current diagnostic methods and are likely to become the standard test for samples submitted from an outbreak.

Costing hospital outbreaks

The effect of SRSV outbreaks on the provision of hospital services is striking. Such outbreaks have a major impact, not only in affected departments, but also throughout the whole hospital and involve severe staff shortages, sometimes leading to hospital

closure.^{6,7} Between 1992 and 1995 in England and Wales, 277 hospital outbreaks were reported to the national surveillance scheme.¹ One outbreak, which lasted for nearly three weeks, closed a 220-bed hospital (an elderly care facility) due to staff shortages.⁷ A similar outbreak affected 58 patients and 34 staff on four wards in a 280-bed elderly care hospital in Australia.³¹ Spread to the fourth ward was attributed to staff movements between the wards and cost an estimated A\$7600 (approximately £3800) in sick leave and A\$10600 (approximately £5300) in bed closures on that ward alone. Surprisingly, this considerable annual burden on healthcare in the U.K. appears to have been almost ignored, with no published data on the costs of SRSV outbreaks in hospitals to date.

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Appendix A

Information for healthcare workers

Gastroenteritis due to SRSVs (small round structured viruses)

SRSVs are a frequent cause of D&V in the community and the commonest cause of outbreaks of gastroenteritis in hospitals. Transmission occurs by vomiting, by faecal-oral spread or by consumption of contaminated food. Most infections are seen during the winter ('Winter Vomiting Disease') and outbreaks usually occur at that time of year. The infection is self-limiting and usually mild. However, since large numbers of patients and staff may be involved, outbreaks of SRSV can be a major disruption to healthcare service provision.

Criteria for suspecting an outbreak is due to SRSV

- Short incubation (15–48 h)
- Illness duration 12–60 h
- Vomiting in > 50% symptomatic patients
- Patients and staff both affected

Control of SRSV outbreaks

- Cohort nurse or isolate symptomatic individuals
- Emphasize the importance of handwashing
- Wash and dry hands before and after patient/environmental contacts
- Wear gloves and aprons for contact with infected patients/environment
- Avoid transfer to unaffected wards or departments (unless medically urgent and after consultation with infection control staff). The priority is to stop spread of the virus to other areas
- Minimize movements of staff between affected and unaffected wards
- Exclude affected staff until symptom-free for 48 h
- Caution visitors that they may be exposed to infection
- Wherever possible, exclude children from visiting affected wards

- Advise relatives not to visit if they are feeling unwell or have D&V.
- Use 1000 ppm hypochlorite to disinfect contaminated environmental surfaces.
- Thoroughly clean the ward and change curtains before re-opening to admissions (usually 72 h after symptoms have subsided). This will be arranged by the infection control team.
- Refer to enteric precautions and the outbreak policy in the infection control folder.

Remember always to inform the infection control team of any unexpected vomiting or diarrhoea among patients or staff in your area.

Information for patients

What is SRSV?

Small round structured virus (SRSV) is a frequent cause of diarrhoea and vomiting in the community and is most common during the winter. It is sometimes called 'winter vomiting disease'.

Why is it a problem?

SRSV causes symptoms of 'gastric flu'. It lasts 2–3 days and the person will have diarrhoea and/or vomiting. Some people may have a raised temperature, headaches and aching limbs. The illness is usually mild in nature and gets better without antibiotics. SRSV does however spread very easily in the hospital due to the close contact between patients and staff. Large numbers of patients and staff can be involved and it is important to stop the illness from spreading around the hospital or to relatives and friends.

How does this affect me?

If you do become unwell on the ward you may be moved to a sideroom or to an area with other patients with the same illness. You should have as few visitors as possible and they will need to wash their hands before and after seeing you.

Will I need treatment?

Antibiotics are not needed to treat SRSV, the main treatment is making sure you drink plenty of fluid. If you develop diarrhoea and vomiting a stool sample may be sent to the laboratory for testing. Once the illness is over no further action is

necessary and your treatment will continue as before.

Can I have visitors?

Yes you can have visitors. Although the symptoms are mild, children should be discouraged from coming to visit you, as they may be particularly susceptible to the virus. Friends or relatives that are unwell or suffering from diarrhoea and vomiting themselves should also not visit. If you have any concerns at all about someone visiting please discuss this with a doctor or nurse. To prevent the spread of infection your visitors should avoid visiting other wards and hospital food establishments where possible.

Do visitors need to take precautions when visiting me?

Visitors should wash their hands thoroughly both before and after visiting you. It is also advisable to keep your number of visitors to a minimum as they may pick up the virus when on the ward. The nursing staff will advise if anything further is necessary.

Appendix B

Guidance on cleaning up vomit and faeces

The following precautions should be used by individuals who clean up vomit or faeces in order to minimize the risk of infection to themselves.

1. Wear disposable gloves and apron.
2. Use paper towels to soak up excess liquid. Transfer these and any solid matter directly into a clinical waste bag.
3. Clean the soiled area with detergent and hot water, using a disposable cloth.
4. Disinfect the contaminated area with freshly made 1000 ppm (0.1%) hypochlorite solution. Note that hypochlorite is corrosive and may bleach furnishings and fabrics.
5. Dispose of gloves, apron and cloths into the clinical waste bag.
6. Wash hands thoroughly using soap and water and dry them.

Treatment of specific materials

- Contaminated linen and bed curtains should be placed carefully into laundry bags appropriate to guidelines for infected linen (soluble alginate

bags with a colour coded outer bag) without generating further aerosols. Contaminated pillows should also be laundered as infected linen unless they are covered with an impermeable cover, in which case they should be disinfected with 0.1% hypochlorite solution.

- Contaminated carpets should be cleaned with detergent and hot water, then disinfected with hypochlorite (if bleach-resistant) or steam cleaned.
- Contaminated hard surfaces should be washed with detergent and hot water, using a disposable cloth, then disinfected with 0.1% hypochlorite solution. Cloths should be disposed of as clinical waste. Non-disposable mop heads should be laundered on a hot wash.
- Horizontal surfaces, furniture and soft furnishings in the vicinity of the soiled area should be cleaned with detergent and hot water, using a disposable cloth.
- Fixtures and fittings in toilet areas should be cleaned with detergent and hot water using a disposable cloth, then disinfected with 0.1% hypochlorite solution.

Cleaning up vomit in food preparation areas

1. Using the above principles, carefully remove all vomit and clean the area.
2. Disinfect the food preparation area (including vertical surfaces) with a freshly prepared hypochlorite-based cleaner that releases 1000 ppm of available chlorine.
3. Destroy any exposed food, food that may have been contaminated and food that has been handled by an infected person.
4. Any incident of vomiting should be reported to the infection control team and appropriate managers.

The above recommendations for cleaning and disinfection of vomit and faeces are modified from those made by the Advisory Committee on the Microbiological Safety of Food Working Group on Foodborne Viral Infections.