NOROVIRUS: INFECTION CONTROL AND MANAGEMENT

PRACTICE GUIDELINE©

DOCUMENT SUMMARY/KEY POINTS

- SCHN Norovirus Infection Control and Management Practice Guidelines are developed following the NSW Health Infectious Diseases: Control Guidelines - Gastroenteritis in an institution control guideline control guideline April 2019 - https://www.health.nsw.gov.au/Infectious/controlguideline/Pages/gastro.aspx and the NSW Health Gastro Pack For Hospitals And Aged Care Facilities https://www.health.nsw.gov.au/Infectious/gastroenteritis/Documents/hospital-gastro-pack.pdf
- The incubation period for *Norovirus*-associated gastroenteritis in humans is usually 24 to 48 hours, but cases can occur within 12 hours of exposure[2].
- Symptoms usually last 12 to 60 hours.
- Contact and Droplet Precautions are an effective way to prevent the transmission of the disease.
- If the child is vomiting or has significant diarrhoea, infectious droplets may facilitate viral spread. Therefore staff involved in direct care of a vomiting patient or one with diarrhoea should wear personal protective equipment (PPE) including surgical masks and eye protection for protection[1]. **Ensure lid of toilet is closed when flushing.**
- Performing hand hygiene with soap and water is important to stop the spread to the healthcare worker, other patients and visitors.
- Patients with *Norovirus* should remain in the ward most appropriate to their medical condition where they can be best cared for. However, they **MUST** be nursed in a single room or cohorted with other children with *Norovirus* in a dedicated room with ensuite toilet and bathroom facilities.
- Cleaning of rooms, contaminated surfaces and toys needs to be done with hypochlorite disinfectant (dichloroisocyanurate tablets) (bleach clean).

Approved by:	SCHN Policy, Procedure and Guideline Committee	
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Team Leader:	Clinical Nurse Consultant	**Area/Dept**: Infection Control, CHW

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CHANGE SUMMARY

- Due for mandatory review.
- Network document minor changes only from CHW version.

READ ACKNOWLEDGEMENT

- Medical and Nursing staff caring for patients with or suspected of having Norovirus should read this document.
- Infection Prevention and Control staff should read and acknowledge they understand the contents of this document.
- Pathology staff with contact with patients with or suspected of having Norovirus should read this document.

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Introduction

Norwalk virus in the genus *Norovirus* is a leading cause of gastroenteritis worldwide and is recognised to be one of the most important causative agents responsible for gastroenteritis outbreaks in developed countries[1]. Low infectious dose, high infectivity, short incubation period, extreme stability of the virus in the environment and frequent lack of prodromal symptoms contribute to the challenges of managing outbreaks in confined environments such as hospitals, schools or institutions.

Outbreaks can occur at any time of the year, but are most frequent during winter[1].

What is *Norovirus*? What is Norwalk virus?

There is a single species, *Norwalk virus*, in the genus *Norovirus* (family *Caliciviridae*). Norwalk virus is a non-enveloped single-stranded RNA virus that cause acute gastroenteritis in humans. Norwalk virus is the recommended name for this pathogen, but “norovirus” is currently used more widely in Australia.

Clinical Presentation

The incubation period for *Norovirus*-associated gastroenteritis in humans is usually 24 to 48 hours, but cases can occur within 12 hours of exposure[2]. *Norovirus* infection usually presents as acute-onset vomiting, watery non-bloody diarrhoea with abdominal cramps and nausea. Low-grade fever also occasionally occurs, and vomiting is more common in children.

Dehydration is the most common complication, especially among the young and elderly, and may require medical attention. Symptoms usually last 24 to 60 hours. Recovery is usually complete and there is no evidence of any long-term sequelae. Studies have shown that as many as 30% of infections may be asymptomatic, although the role of such infections in *Norovirus* transmission is not well understood[2].

Command and Control

- Responsibility for implementation of this policy is the direct responsibility of appropriate clinical line managers and treating Team caring for affected patients.
- The clinical line managers will consult with the Infection Prevention and Control (IPC) Team regarding appropriate patient placement and infection control procedures.
- Where there is a dispute between clinical line managers and IPC / Microbiology or if there is no policy on a particular issue or the policy needs updating then there needs to be further discussion between clinical line managers, IPC, Microbiology and the Deputy/Director of Clinical Operations (DCO) to develop a consensus agreement based on best evidence. If a dispute arises about policy it is to be referred to the Chief Executive for resolution.

- *Norovirus* infection is not mandated as a reportable infection to Public Health Units. However all gastroenteritis cases arising in admitted patients in the Network must be notified by telephone to the appropriate Public Health Unit; see IB2013_010, <https://www.health.nsw.gov.au/Infectious/Documents/ph-hospitals-notification.pdf> and <https://www.health.nsw.gov.au/Infectious/Documents/ph-doctor-notification.pdf>.
- A Reportable Incident Brief (RIB) will be sent to NSW Department of Health on any potential media interests or problems. This is currently the responsibility of the Executive Assistant to the CE.
- Microbiologist or IPC Practitioner will notify the Director of Clinical Operations of identification of any known *Norovirus* clusters. The Deputy/DCO will in turn notify the Chief Executive (CE).
- A report on management of any new *Norovirus* cluster will be made to the next IPC Committee meeting. The IPC Committee minutes will be sent to the Health Care Quality Committee for information.
- Any ongoing outbreak of infections or colonisations not responding to appropriate infection control measures will be discussed with clinical members of Executive in collaboration with the appropriate clinical teams to discuss what further actions may be required.

Mode of Transmission

Norovirus is transmitted via the faecal-oral route, either by consumption of contaminated food or water or by direct person-to-person spread. Environmental and fomite contamination can also act as a source of infection. Good evidence exists for transmission due to aerosolisation of vomitus that presumably results in droplets contaminating surfaces or entering the oral mucosa and being swallowed, and this is an important mechanism of transmission in outbreaks[2].

Norovirus is highly contagious, and it is thought that an inoculum of as few as 10 viral particles may be sufficient to infect an individual[2]. Although pre-symptomatic viral shedding can occur, shedding usually begins with the onset of the symptoms and can continue for up to 2 - 3 weeks after recovery[2]. It is unclear to what extent viral shedding after clinical recovery signifies continued infectivity[2].

Pathology Specimens and Diagnosis of *Norovirus*

Pathology Specimens

- Staff must comply with Contact and Droplet Precautions when entering and leaving the patient's room.
- Stool samples are to be collected. **DO NOT** send vomitus to the laboratory as testing is not validated on this specimen type.

- Seal specimen receptacles correctly, label specimen accurately and complete all relevant details on the request form.
- Place specimen and pathology form into a plastic biohazard specimen bag for transport.
- Perform Hand Hygiene after sending specimen.

Diagnosis

A commercial multiplex real time reverse transcriptase polymerase chain reaction (RT-PCR) assay (LightMix Modular Gastroenteric Pathogen PCR from Roche Diagnostics Australia) on stool samples is the test routinely used for diagnosis.

In addition to microbiological techniques, several epidemiological criteria have been proposed for use in determining whether an outbreak of gastroenteritis is of viral origin. Kaplan's criteria for this purpose are as follows:[3]

- a mean (or median) illness duration of 12 to 60 hours,
- a mean (or median) incubation period of 24 to 48 hours,
- more than 50% of people with vomiting and
- no bacterial agent identified on routine testing

Infection Control Precautions

Contact and Droplet Precautions

Contact and droplet precautions are to be implemented by **all staff** entering the child's room until the child has been asymptotic for 48 hours.

- Alcohol-based hand rubs (ABHR) may have slightly less activity against *Norovirus* than washing hands with soap and water at a hand basin.
- High hand hygiene compliance is critical and during periods of sustained *Norovirus* transmission.
- Perform hand wash with soap and water when dealing with patients that are symptomatic with *Norovirus*. The use of ABHR needs to remain routine for all healthcare staff to prevent transmission of other organisms.

Staff

- Performing hand hygiene
    - Use ABHR or soap and water before entering the patient's room.
    - Wash hands with soap and water before leaving the room, after touching the patient and/or potential contact with bodily fluids.
        - Use ABHR or soap and water when outside the room before leaving the ward or attending another patient.
- Personal Protective Equipment (PPE) – Contact and Droplet Precautions

- Don impervious (fluid resistant) gown and gloves when attending a patient who has diarrhoea and/or vomiting.
- Don surgical mask and protective eyewear if the patient is vomiting or has recent or current episodes of diarrhoea. Gloves must be worn when in contact with blood or bodily fluids of infected children as per standard precautions.
- Gloves, gowns, surgical masks and eye protection are required when cleaning vomit or faeces.
- Remove PPE carefully without self-contamination on the inside of the room prior to leaving. Place disposable item in general waste bin provided in the room.
- Protective eye wear needs to cleaned thoroughly with a 70% isopropyl wipe.

Parents and visitors

Visitors should be limited to immediate family only – staff are to inform parents and visitors of appropriate hand hygiene method.

- Hand hygiene
  - Use ABHR or soap and water before entering the child's room.
  - Wash hands with soap and water if there is any contact with body fluids/patients, before leaving the room. Use ABHR or soap and water when outside the room before leaving the ward.
- Gloves, gowns and surgical masks are required when cleaning vomit or faeces
- Toilets where body waste is being disposed should have the lid of the toilet closed before flushing to prevent aerosols being generated.
- Parents and carers must follow hospital guidelines closely to avoid transmitting infection – see section below.

Isolation and Placement of Patients with Norovirus

All inpatients

- **Any child with *Norovirus*** should be nursed on the ward which is most appropriate for their medical needs. Preferably not in Camperdown, Clancy or Edgar Stephens Wards (contact IPC Team to discuss).
- All children with *Norovirus* **MUST** be nursed in a single room or cohorted with other children with *Norovirus* in a dedicated room with ensuite toilet and bathroom facilities. **Only cohort after consultation with Infection Prevention and Control**.
- Patients with *Norovirus* must not share a room or bathroom with patients who do not have *Norovirus*.
- The patient's room must have a staff hand wash basin.
- Adequate supplies of impervious (fluid resistant) gowns, gloves, surgical masks, eye protection and alcohol 'hand rub' are required outside the room.

- Patients who have been exposed but remained asymptomatic should only be isolated if they develop clinical symptoms.

Note: Notify Infection Prevention & Control team if there are any other patients, parents or carers with symptoms of gastroenteritis. IPC will notify the Public Health Unit if required.

Duration of Isolation Requirements for Specific Patient Groups

***Patients with T-cell immunodeficiency (e.g. Bone marrow transplant (BMT), solid organ transplant patients diagnosed with* Norovirus**

Because of possible prolonged excretion of *Norovirus*, patients with T-cell immunodeficiency are considered infectious for the duration of that particular inpatient encounter at the Children's Hospital at Westmead (CHW) and Sydney Children's Hospital (SCH).

If they are to remain inpatients for an extended period of time, a clearance process for de-isolation may be considered.

- Before starting this process, the patient must be asymptomatic for at least 48 hours.
- Three stool samples collected one a week over three weeks, should be submitted to the laboratory for *Norovirus* testing. If all three samples test negative for *Norovirus*, the infection control status of the patient can be revised.

Note: If the patient is discharged prior to this process, the stool screen does not need to be continued during the next encounter with the hospital if they have been asymptomatic for 48 hours.

- Must remain in isolation in a room with dedicated ensuite bathroom/toilet facilities.

***General oncology or solid organ transplant patients diagnosed with* Norovirus**

- Must be considered infectious while they have diarrhoea +/- vomiting.
- Once symptoms have resolved, can undergo a clearance process as described above.

***Non-immunosuppressed inpatients who are diagnosed with* Norovirus**

- When asymptomatic for 48 hours they can be taken out of isolation and maintained with standard precautions. **Follow-up stool testing is NOT required**.

Parents and Carers of admitted patients

Parents and carers of children admitted with potential or proven infectious diarrhoea +/- vomiting

- Must not use shared facilities for food preparation in the ward or shared recreational areas in the ward or throughout the hospital even if they themselves are asymptomatic for the duration of their child's symptoms.
- Must not sleep in the parent hostel or parent rooms provided on the ward. If staying in the hospital with their child they must sleep in their child's room
- Must use the toilet and bathroom facilities in the child's isolation room.
- Must request nurse assistance to get food, beverages or feeding bottles from the ward kitchen for their child.
- If the parent needs to purchase meals themselves the parent can go to the providers in the hospital and either eat in an area isolated from other customers and patients - for example outdoor areas - or eat in their child's room.
- Any linen required by the patient or the parent must be provided by the nursing staff. Parents of symptomatic children are not to access the clean linen dispensary on the ward.

Parents and carers who have gastroenteritis symptoms

- Should be advised to stay home if possible.
- If they cannot stay home they must not use shared facilities for food preparation or shared recreational areas until asymptomatic for 48 hours.
- Perform hand hygiene with soap and water frequently, particularly after vomiting, after using the toilet, on leaving the patient's room, and before food or drink preparation.
- When they leave the child's room they must go straight home and not used shared Hospital facilities.
- Any linen required by the patient or the parent must be provided by the nursing staff. Parents of symptomatic children are not to access the clean linen dispensary on the ward.
- If there is a need to purchase meals, after the parent's acute symptoms abate, the parent must liaise with the ward Nursing Unit Manager and After Hours Nurse Manager so that they can be assistance with this task while waiting for the 48 hours post resolution of symptoms to be attained.
- Also refer to the NSW Health Norovirus Fact Sheet https://www.health.nsw.gov.au/Infectious/factsheets/Pages/norovirus.aspx

Hospital Volunteers

General visiting by hospital volunteers needs to be postponed until the patient or the symptomatic parent/carer has been symptom free for 48 hours.

There are some circumstances in which volunteer assistance is acceptable. In this case the volunteer needs to comply with the same requirements for hand hygiene and PPE usage as staff.

Ward Grandparent Volunteers can continue to work with their symptomatic child but need to comply with the same requirements for hand hygiene and PPE usage as parents.

Book Bunker lending should be postponed until the child or the symptomatic parent/carer has been symptom free for 48 hours.

Visitors organised by the Public Relations Department to the wards must not visit a symptomatic patient. This also must be postponed until the patient or the symptomatic parent/carer has been symptom free for 48 hours.

Patient Activity Outside Room - Infection Management Plan

- The child can use the outside areas in the hospital grounds.
- The child cannot visit the common food outlet areas.
- The child cannot visit the Starlight Room.
- The child cannot visit Ronald McDonald House.
- The child cannot attend the schoolroom.
- The child cannot visit other inpatients.
- Activities and school can be organised in the room.
- All other activities must be negotiated with Infection Prevention and Control Team.

Patient care equipment

- Must be dedicated for the **sole purpose** of the patient.
- The patient should have his / her own equipment such as stethoscopes, sphygmomanometers, and thermometers.
- This equipment should remain in the patient's room for the duration of the patients stay.
- Perform routine cleaning and disinfection of frequently touched environmental surfaces (door handles, computer equipment, hand/bed railing, telephones, commodes, toilets) and equipment in isolation.

- Once the patient has left the room (discharged or transferred), Cleaning Services follow the Cleaning of the Healthcare Environmental Policy Directive (PD2020_022). Ward staff are to request an infectious/terminal clean stating that the patient has Norovirus.
- All dedicated equipment must be wiped over with chlorine-based disinfectant (e.g. 1 dichloroisocyanurate tablet dissolved in 5L water for stainless steel surfaces, 1 tablet in 1L of water for other non-porous surfaces, and 5 tablets in 1L for porous surfaces). Ask Cleaning/Domestic Services for equipment. Other options include steam sterilisation using an autoclave, or discarding the item.
- If the equipment has been in contact with faeces or vomit, it must be washed with a neutral detergent prior before cleaning with chlorine-based disinfectant as described above [1, 4].
- For special equipment that cannot be cleaned according to the instructions above, it is important to minimise any possible exposure to *Norovirus* in the patient room. Other cleaning options can be discussed with the Infection Prevention and Control Team.

Room Cleaning

- PPE, including gloves, impervious gown, protective eyewear and a surgical mask, should be worn by people cleaning areas contaminated by faeces or vomit.
- When cleaning the bathroom areas, special attention should be given to cleaning all potentially contaminated areas, including the toilet roll dispensers, toilet seats and lid, flushing mechanism, safety handles, shower chair, light switches, regardless of whether they are visibly soiled or not[4].
- Toilets when cleaned should have the lid of the toilet closed before flushing to stop aerosols being generated.
- During outbreaks, change privacy curtains (cloth or disposable) when they are visibly soiled and upon patient discharge or transfer
- Once the patient is discharged, request the room to have an infectious/terminal clean, as per the Cleaning/Domestic Services protocol.

Linen

- All staff must perform hand hygiene immediately prior to accessing the ward's clean linen dispensary to prevent contaminating clean linen.
- If linen is removed from the clean linen dispensary it must not be replaced back onto the trolley, but be placed in to the used linen skip.
- PPE should be worn by staff when handling soiled linen from an infected patient, regardless of the child being in the bed or not.
- Used linen, whether visibly soiled or not, should not be shaken.

- Used linen should be bagged and tied at the point of generation. Care needs to be taken not to overfull the linen skip. It should not be filled more than ¾ full so that it can be secured safely.
- The laundering of used linen should be consistent with AS/NZS **4146**:2000: Laundry Practice.

Eating Utensils

Meal trays and eating utensils/plates and cups are to be collected from the room by staff with care. They can be placed in the Food Services trolley to be transferred to the Food Services department for processing.

After carefully placing the used meal tray on the trolley staff need to be mindful to perform hand hygiene with soap and water in case of viral contaminants on the tray.

Waste Management

Toilets where body waste is being disposed should have the lid of the toilet closed before flushing to stop aerosols being generated.

- General waste from a *Norovirus* patient's room is to be placed appropriately into the general waste receptacle. It is not to be over filled.
- When there is a requirement for a larger general waste bin to cope with the use of disposable gowns contact the Cleaning/Domestic Services supervisor so that an appropriate general waste bin can be obtained. After general working hours if the bin is more than ¾ full contact the after-hours cleaning supervisor so that appropriate action can be taken.

General Maintenance

Routine maintenance needs to be postponed until the patient has been symptom free for 48 hours.

Urgent maintenance can proceed with appropriate PPE wear and hand hygiene while the patient is in the acute stage of the illness.

Contact the IPC team for advice if required.

Discharge of Patient from Hospital

Discussion should take place before discharge to ensure the patient and family is fully informed about *Norovirus*. The patient should be requested to alert staff of *Norovirus* status if admitted to a health care facility in the following week. Children cannot be immediately

discharged to Ronald MacDonald House, other housing arrangements must be organised until they are deemed non-infectious.

Staff Management

Minimise as much as possible the circulation of staff between affected and unaffected areas[1]. Where possible, designated staff should care for affected patients.

Staff with gastrointestinal symptoms should leave work immediately and not return to work until 48 hours after their last episode of vomiting or diarrhoea[4]. Affected staff should seek medical advice immediately.

Food handlers should be excluded from food preparation until at least 48 hours after their symptoms have stopped[4].

Recuperating staff may shed the virus for a number of weeks after their symptoms have disappeared, therefore the importance of hand washing and personal hygiene on returning to work should be reinforced[4].

Non-essential staff should not be allowed to enter the patient care area of infected patients in order to prevent unnecessary exposure and to stop further spreading of the disease[1].

Staff management during outbreak and ward closure situations.

Non affected staff may leave the ward during their designated meal breaks. They need to ensure they perform hand hygiene with antiseptic wash and water immediately prior to leaving the ward, take care opening the main ward door, and use ABHR on the outside of the ward. They then may purchase meals and consume them in any recreational or dining area in the hospital.

For designated meal breaks taken on the ward, staff need to ensure they perform hand hygiene with soap and water immediately prior to entering the area used as a staff meal/recreational room. ABHR should be used on the inside of the room prior to consumption of food and drink.

No food or drink other than water should be consumed in the ward area by staff including the ‘nurses’ station’.

Staff that have had cars valet parked earlier in the shift can leave the ward and go to the Security Department Office to get their keys during an evening shift; or prior to leaving at the end of the evening shift. However they must ensure they perform hand hygiene with soap and water immediately prior to leaving the ward, take care opening the main ward door, and use ABHR on the outside of the ward.

Staff Education

- Infection control will provide education on request.
- Refer to the Fact sheet on Norovirus https://www.health.nsw.gov.au/Infectious/factsheets/Pages/norovirus.aspx

Outbreak Management

If there appears to be two or more individuals in a ward area affected by symptoms indicative of Norovirus:

- Patients
- Parent/Carer and family/visitors
- Health Care Staff/Volunteers

The Nursing Team Leader needs to refer to the NSW Health Gastro Pack < https://www.health.nsw.gov.au/Infectious/gastroenteritis/Documents/hospital-gastro-pack.pdf.

- NSW Health Norovirus Factsheet: https://www.health.nsw.gov.au/Infectious/factsheets/Pages/norovirus.aspx

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