

**HPS Norovirus Outbreak Guidance
Season 2014 - 2015**

**Preparedness, control measures & practical considerations
for optimal patient safety and service continuation in
hospitals**

NB About a month to go is week 37 – 15 / 9 / 2014

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The algorithms on pages 36 & 37 were produced for a Working Party's revision of the Chadwick et al 2000 Guidelines: Guidelines for the Management of Norovirus Outbreak in Acute and Community Health and Social Care Settings.²

1. Objectives for effective norovirus management in hospitals

As norovirus infection confers only short term immunity and noroviruses spread very effectively in hospitals and the community, preventing all norovirus outbreaks in hospitals is impossible. However, what is possible is to minimise the incidence of norovirus outbreaks, and when they occur to limit their impact and the disruption of normal healthcare services.

The objectives for effective norovirus management in hospitals can therefore be summed up as follows:

1.1. To reduce the risk of norovirus outbreaks

By:

- Planning and preparing for norovirus outbreaks every year.
- Being alert to the risk of individual patients potentially having norovirus.
- Identifying promptly those symptomatic patients that could be infectious.
- Caring for symptomatic patients away from non-exposed patient.
- Making visitors and others aware of the situation, and that they should not visit hospitals if they have gastrointestinal symptoms suggestive of an infection.
- Promoting and complying with Standard Infection Control Precautions during all clinical care, and using Transmission Based Precautions when a person is known or suspected to have an infection caused by a specific agent.

1.2. To reduce the impact of norovirus outbreaks

By:

- Clinical staff being alert to the possibility of norovirus in their patients.
- Informing the Infection Prevention and Control Team (IPCT) if 2 or more patients develop norovirus symptoms (see [case definitions](#)).
- Following IPCT advice and instigating and complying with approved Norovirus Control Measures.
- Clinical, management and infection control professionals working together as a team to reduce the impact of norovirus on clinical services.
- Making patients, staff and visitors aware of the situation and asking for their compliance with control measures.

2. General information about noroviruses in hospitals

2.1. About noroviruses and norovirus infection

Noroviruses	Noroviruses are non-enveloped viruses which belong to the <i>Caliciviridae</i> group of viruses. Former names for this group of viruses include Norwalk-like viruses, winter vomiting disease, and Small Round Structured Viruses.
Clinical manifestations	Noroviruses cause gastrointestinal infection which is characterised by: acute onset of non-bloody watery diarrhoea and/or vomiting – which if present is often projectile. Also present may be: abdominal cramps, myalgia, headache, malaise and a low grade fever may be present in up to 50% of cases.
Strain variation/virulence	Recent reports have highlighted that noroviruses have many serotypes which may express differences in virulence and pathogenicity. In particular, the GII.4 norovirus strain has gained importance in outbreaks involving institutions, with increased transmissibility and virulence over more common UK strains, resulting in excess expected mortality and morbidity rates amongst affected patients. For further information: ^{3;4}
Incubation period	Usually 12-48 hours. Median 33 hours. Reported as early as 10 hrs post exposure.
Infectious dose	Very small, between 10-100 virus particles.
Duration of illness	Norovirus gastrointestinal symptoms usually resolve within 2-3 days – but 40% of patients can still be symptomatic at 4 days.
Period of infectivity	Patients (and staff) should be considered infectious whilst they are symptomatic and until they symptom free for 48 hours or stools have returned for 48 hours to their normal (pre-infection) pattern. Noroviruses can be detected in stools even after symptoms have resolved and stools have returned to normal. The impact of this on cross-transmission is unknown. Immunocompromised patients can excrete the virus for considerable periods of time.
Diagnosis	Norovirus should be suspected in any patient who develops diarrhoea with or without vomiting without other obvious cause (See definitions). NB if suspecting norovirus, e.g. during a possible outbreak inform the IPCT as well as the laboratory as virology testing for norovirus is not routinely done on all faecal samples.
Severity of illness	Usually self-limiting and considered mild. Mortality as a consequence of norovirus can occur and does occur, particularly in elderly patients with co-morbidities.

<p>Patient support</p>	<p>Norovirus infection can cause rapid dehydration particularly in elderly patients. Therefore symptomatic patients should have their fluid balance monitored and receive rehydration as necessary. Assuming bacterial, e.g. <i>C. difficile</i>, causes have been ruled out, anti-emetics may help symptomatic patients.</p>
<p>Modes of transmission</p>	<p>Contact via the Faecal-Oral route and airborne via inhalation followed by ingestion of norovirus-contaminated aerosolised vomit.</p> <p>Direct Contact</p> <ul style="list-style-type: none"> • Hands come into contact with faecal matter and subsequently touch the mouth. <p>Indirect Contact</p> <ul style="list-style-type: none"> • Hands come into contact with contaminated equipment or contaminated surfaces and subsequently touch the mouth. • Consumption of faecally contaminated food or water. <p>Airborne Dissemination</p> <ul style="list-style-type: none"> • Patients with projectile vomiting can disseminate large quantities of virus laden aerosols which can contaminate extensive areas of the ward environment. Cross-transmission can then occur when patients and staff inhale and subsequently ingest these virus laden aerosols, or consume food on which these aerosols have landed. • Flushing lidless toilets is also considered to be a means of contaminating the surrounding environment. <p>NB 30mls of vomit may contain up to 30,000,000 virus particles. 1 gram of faeces can contain up to 5 billion infectious doses of norovirus¹.</p>
<p>Environmental survivability</p>	<p>Noroviruses can survive:</p> <ul style="list-style-type: none"> • On any surface for at least a week. • On foods in a refrigerator for up to 10 days. • Freezing indefinitely.

2.2. Definitions of norovirus cases and norovirus outbreaks:

Definitions (cases/exposed and non-exposed persons)

Possible Norovirus Case:

- A person (patient or staff) who, within a 24 hour period has, 3 or more episodes of non-bloody diarrhoea*, **AND/OR**, 2 or more episodes of vomiting, without having any other obvious cause for symptoms.

Confirmed Norovirus Case:

- A person (patient or staff) who, within a 24 hour period has, 3 or more episodes of non-bloody diarrhoea*, **AND/OR**, 2 or more episodes of vomiting, without having any other obvious cause for symptoms **AND** who has tested positive for norovirus.

Exposed asymptomatic patients

- Patients who have been exposed to a symptomatic possible or confirmed norovirus case by being in the same room as possible or confirmed cases and whose last exposure was within the past 48 hours.

Non-exposed patients

- Patients who, within the past 48 hours, have not been cared for, or been in the same room as a possible or confirmed norovirus case, in hospital or a care home

Please note:

Persons who have had *Clostridium difficile* toxin detected in their faeces (or been diagnosed with *Clostridium difficile* infection by other methods) should **NOT** be excluded as norovirus cases. Persons who have been diagnosed with other gastrointestinal infections should be excluded as norovirus cases.

*Does not include loose stools induced by laxatives or enemas.

In the absence of other causes, projectile vomiting is diagnostic of norovirus.

Definitions (outbreak)

Possible Outbreak - 2 or more Possible Norovirus Infection cases in a single care unit, e.g. ward.

Confirmed Outbreak – 1 or more Confirmed Norovirus Infection cases in a single care unit, e.g. ward.

The IPCT may assess patients as possible cases based on the overall presentation of an outbreak.

Concurrent outbreaks of norovirus & *Clostridium difficile* infection

Interactions between *Clostridium difficile* and norovirus have not been investigated fully, and it is unknown whether *Clostridium difficile* infection may augment the pathogenesis of norovirus infections or vice versa. In this situation both events should be investigated and managed as separate but concurrent events. This can also apply to other gastro-intestinal pathogens but *Clostridium difficile* infection is mentioned as it is the other main common hospital gastrointestinal pathogen.

Minimum criteria for a bay to be used for a norovirus bay closure option

- A ward bay used for a norovirus bay closure should have closable doors, wash-hand basin and toilet facilities which are not shared by patients who do not have symptoms.
- IPCT risk assessment confirming suitability.

3. Why noroviruses cause outbreaks in hospitals settings

3.1. The reasons noroviruses are a challenge in hospitals settings:

- The infectious dose for norovirus is very low.
- There are multiple routes of transmission.
- There are a variety of noroviruses – and infection with one strain does not confer immunity from other strains.
- Immunity following infection with norovirus does not last long.
- The attack rate – the number of people who get infected is high – average 50% of those exposed.
- It is easy for frequently touched sites to become contaminated - can be as high as 24%.
- Norovirus can survive for days on any surface – including exposed food and wrapped food items.
- People may be infectious before being symptomatic and once asymptomatic may still excrete norovirus in their stools.
- Norovirus symptoms start very quickly, and if they start with projectile vomiting then many people can be exposed and thereby become infectious without warning.
- It is sometimes difficult to identify cases and to differentiate between cases and non-cases during an outbreak, i.e. patients who have diarrhoea but who don't have norovirus, therefore early identification of an outbreak can be problematic.
- Hospitals have high bed occupancy rates and for efficiency of clinical services, patients are often moved between wards – this means there is a high potential to transmit the virus to other care settings before it is recognised that patients could be infectious.
- Some healthcare workers (HCWs), e.g. medical staff and physiotherapists, work in both norovirus affected and norovirus unaffected areas. These HCWs can transmit the virus to unaffected clinical areas on their hands.
- Effective hand hygiene alone, i.e. without additional control measures, is insufficient to prevent cross-infection.
- Patients with complex conditions may be admitted with symptoms of one disease whilst also incubating norovirus gastroenteritis. This can delay recognition and instigation of infection control precautions.
- Norovirus outbreaks are most common during winter months when the health service is stretched by excess winter admissions.
- Modelling studies suggest there can be a continuation of norovirus outbreaks when wards have a normal patient turn over (0.1-20 days). Long term care wards with a patient stay >20 days can expect the outbreak to stop without endemic continuation⁵.
- Ward closures, although preventing new patients from acquiring norovirus within the ward, can pose a different patient risk by delaying admissions and essential healthcare interventions. Bay closures are implemented to reduce this risk without prolonging the outbreak. Bay closures are being used increasingly in Scotland without prolongation of outbreaks.
- Standard cleaning regimens using neutral detergent alone are ineffective against noroviruses.

3.2. Institutional risk factors that increase the norovirus outbreak risk

- Admission of (identified or unidentified) infectious patients to open ward areas.
- Inappropriate admission of symptomatic infectious patients who could be managed at home.
- Inability to immediately isolate patients who develop symptoms.
- Multiple transfers of patients within units. Unrecognised infectious patients can be transferred to several wards within a 24 hour period and consequently outbreaks could arise in all these wards.
- Symptomatic infectious visitors may visit clinical areas.
- Failure to send faecal specimens promptly for virus detection.
- Delays in recognising possible outbreaks and contacting IPCTs.
- Delays in instituting or errors in performing Norovirus Control Measures.
- Healthcare workers remaining on duty whilst symptomatic.
- Patients most at risk are more frequently in the medical receiving wards and wards with a high proportion of elderly patients.

4. The Norovirus Year – focussing on preparedness

As norovirus outbreaks happen in almost every hospital every year – mainly over the winter period - IPCTs should ensure their systems are optimally prepared to identify and manage norovirus outbreaks. This work should be complementary with the HPS norovirus preparedness and actions listed below.

Month	HPS Activity	Continuous activity
August	Publish HPS Annual Norovirus Season evaluation report Prepare and issue HPS norovirus tracker, norovirus diary Re-issue modified guidance (if necessary) Prepare national key communications for winter preparedness and the coming season Review communication strategy	<ol style="list-style-type: none"> 1. Weekly HPS Norovirus Point Prevalence. 2. Auto searching of the literature using following terms: Norovirus and Outbreak and Hospital or Nosocomial or Care Home or Long Term Care Facility. 3. Review of identified literature for need to modify guidance.
September	Week 37 (15/9/2014) Alert NHS Boards: <i>About 1 month to Norovirus</i> – Implement Norovirus/Winter Planning preparedness plans Remind of any changes in HPS Norovirus Guidance Take part in the winter planning events	
October	Alert NHS Boards and SGHSCD when norovirus season begins	
November	Close monitoring and feedback of any new information on the presentation of norovirus for the current season Prepare key messages for holiday period	
December	Release key messages for holiday period	
January	Ongoing monitoring of season	
February	Ongoing monitoring of season	
March	Initial evaluation of season data	
April	Prepare for NHSScotland season evaluation Based on review of the evidence and if required, modify HPS Norovirus Guidance changes and send to HOAG and then to the service for approval	
May	Meet with national winter planning to agree key dates for coming season NHSScotland norovirus season evaluation.	
June	NHSScotland norovirus season evaluation complete. Take part in Winter Review meeting/winter planning.	
July	Send norovirus season evaluation to HOAG.	

4.1. Local NHS Board Preparedness Plans for optimal preparedness

4.1.1 Out of season and preseason activity

Education and training

- Consider any changes in Norovirus Management and modify teaching programmes if necessary.
- Identify all those who need education/training before the next season and prepare/plan programmes/
- Provide, with others, the education and training on norovirus, e.g. clinical skills on the ward, self-directed learning, or formal sessions.

Create a common purpose - a teams approach - by agreeing/considering

- How best to work with the local HPT to share preparedness and optimise systems to reduce norovirus impact in hospitals and care homes.
- Confirm how the IPCT will operate at times of multiple ward closures or over the holiday period to ensure there is IPCT resilience.
- The communications plans during the norovirus season, who will get what messages when.
- What surveillance data will be kept, how this data will be shared and fed back including the frequency of updates.
- The out-of-hours staffing, communication, reporting and mode of approval of a ward or bay closure.
- How actions will change if the escalation plan is required.
- Confirm which clinical areas, if any, could use a Bay Closure Option if the outbreak presentation is limited to a single bay or manageable area. Explain this to the ward managers involved.

Developing a “pre-occupation with failure” approach

- Visit the receiving areas when patients with norovirus symptoms are most likely to enter the hospital first and make sure that staff in these areas are aware of what to do to minimise the risk of an outbreak.
- Identify the clinical areas that are most vulnerable to norovirus outbreaks and make sure that staff in these vulnerable clinical areas are aware that their assessments and patient placements can have outbreak potential.
- Confirm that staff in these clinical areas are aware of what to do when patients arrive with symptoms of norovirus or are being transferred from areas where people may have norovirus symptoms.
- Have available back up plans for when there is no single room accommodation to care for an individual patient with norovirus symptoms.
- For every outbreak ward or bay closure have a plan of what assessments and checks will be made daily by the IPCT.

Communications check

- Make sure patient information leaflets are available to cover relevant topic areas are up to date, sufficient in supply and available in key areas, e.g. accident and emergency, medical receiving, medical and elderly care wards. <http://www.documents.hps.scot.nhs.uk/hai/infection-control/publications/leaflets/noro-leaflet-2013-04.pdf>.
- Prepare/check email groups for norovirus updates.
- Be ready for the 'About 1 month to go' email at week 37.
- Have copies of the 'Stay at Home' leaflet available and the e-banner on the board web page.

Reviewing and preparing any modifications to local guidance and escalation plan/HIAT colour classifications

- Consider if there is a need to modify either the local guidance or documentation.
- If required, consider how to inform those who need to implement the guidance of any changes to the Norovirus Control Measures.
- Make sure Norovirus Control Measures are **still** available on all wards.
- If facilities have changed over the year consider what impact this could have on the escalation plan.
- Confirm the IPCT are clear on the arrangements in the escalation plan for the coming season.

4.1.2 When the season starts

- Alert Healthcare Workers (HCWs) that the season has started and remind them again of how to access the IPCT and local guidance.
- Keep key HCWs updated throughout the year with details of how the norovirus season is progressing and the implications for practice.
- Maintain an up-to-date record of any ward closures and implications.
- Start regular communications as planned – including using the Safety Briefs for updates on local and national norovirus activity.
- IPCT presence at bed management meetings.
- Post ward closures have a local debrief to learn how such an outbreak might have been prevented, or control measures instigated earlier.
- Continuously review the success or otherwise of a Bay Closure Option. Modify strategy if bay closures are prolonging outbreaks.
- Plan to ensure there is ICPT resilience during the holiday period, i.e. there is IPCN cover for norovirus especially when there are multiple ward closures.

4.1.3 After the Season

- Have a local NHS Board season debrief include the HPT if considered appropriate.
- Take part in the HPS national norovirus evaluation.
- Determine what went well and what needs to change to improve systems for next season.

5. Norovirus Outbreak Schematic and Management

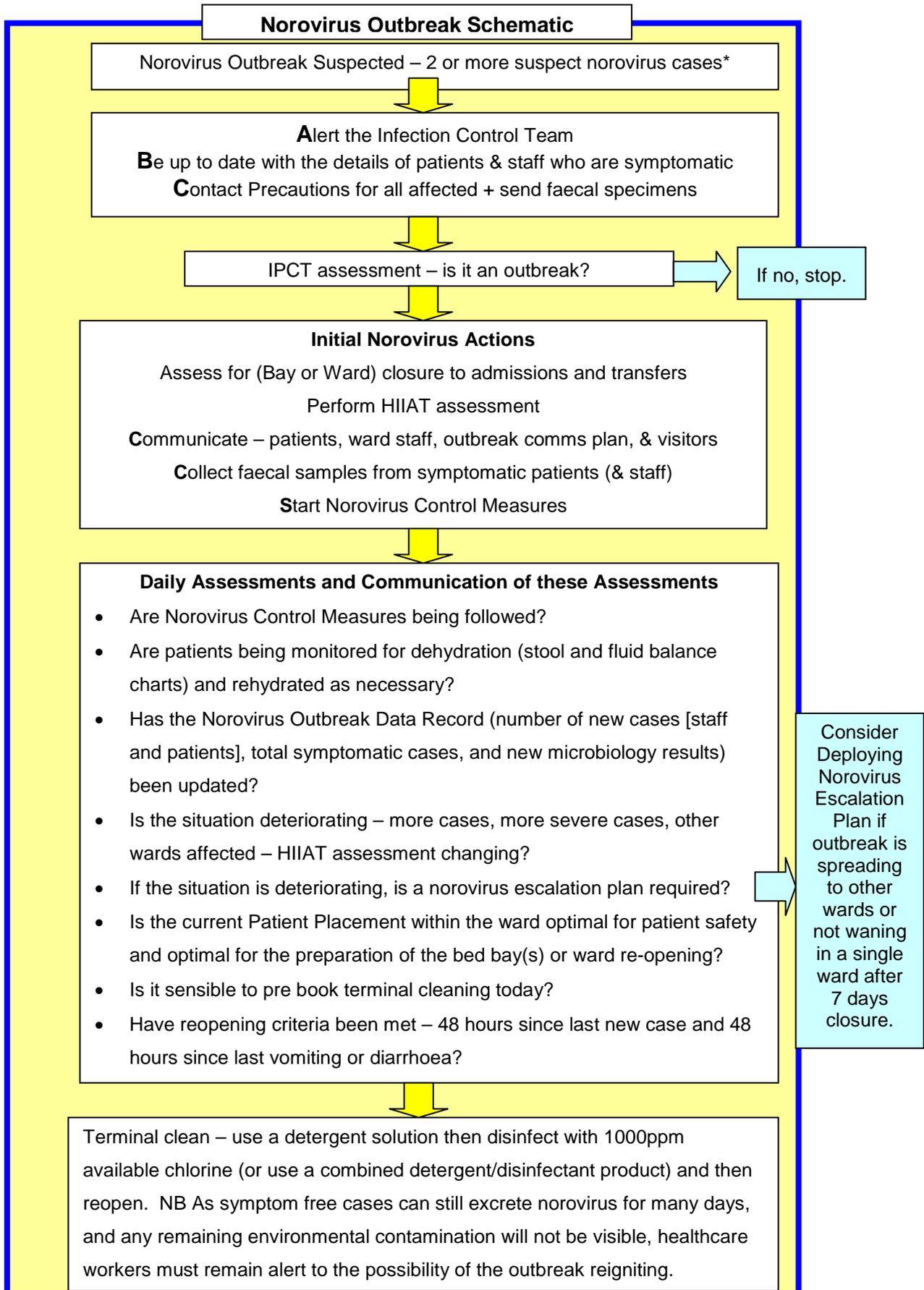
The schematic overleaf shows the progress that a norovirus outbreak in a single ward is expected to follow. That is if there are **2** or more suspected cases, the clinical team should do **ABC**: **A**lert the IPCT promptly, **B**e up-to-date with the details of patients that meet the suspect norovirus case definition and start **C**, **C**ontact precautions for symptomatic patients.

The IPCT should assess the situation and determine if there is a need to close a bed bay or the ward and start Norovirus Control Measures, lead on communications with a pre-agreed team of stakeholders and ask for faecal specimens to be collected. If the ward is closed, the HIIAT should be undertaken to determine if the situation is HIIAT amber or red.

Until the outbreak is declared over the IPCT and clinical team should undertake a daily outbreak assessment and daily communication of these assessments. Outbreak assessments include both the effectiveness of control measure implementation and whether the number of persons affected is increasing or decreasing. In addition the IPCT should work with the clinical team to start preparation for reopening the bed bay or ward. The management team must be kept up-to-date with the likely reopening timetable. If however, the outbreak situation deteriorates the IPCT will determine if an escalation plan is required.

Before reopening bed bay(s) or ward, a terminal clean will be done – after reopening, the clinical and IPCTs need to remain mindful of the possibility of norovirus outbreaks restarting.

It must be remembered that norovirus outbreaks affecting patients and staff in hospital wards can, if poorly managed, easily and rapidly escalate to cause the closure of the hospital to non-emergency admissions. Careful management of the norovirus situation is therefore required especially when there are 2 or more wards closed at any one time on a hospital site.



***Possible Norovirus Case Definition:** Non-bloody diarrhoea** (≥ 3 episodes of loose stool), or vomiting (≥ 2 episodes in 24 hours) without other reason, or, both diarrhoea** and vomiting. **Diarrhoea - does not include loose stools induced by laxatives or enemas.

6. Norovirus Control Measures (Single Ward)

How and when the IPCT is alerted to the possibility of an outbreak is shown as a schematic in [Appendix I](#) "Is it a Possible Norovirus Outbreak?".

Norovirus Control Measures should be deployed on the advice of the IPCT. **NB** The Norovirus Outbreak Daily Checklist and Data Record enables HCWs to keep an up-to-date record of those affected by the outbreak and that the control measures are in place [Appendix II](#).

At the height of the norovirus season, some success in preventing multiple ward closures had been achieved by applying norovirus decontamination to wards that are not affected. This can be considered as a measure aimed at preventing the closure of wards.

6.1. Risk Assessment for Ward or Bay Closures

The IPCT will undertake a risk assessment of a possible norovirus outbreak and determine whether there should be complete or partial restriction of admissions/transfers. An algorithm showing how such an assessment can be made is provided ([Appendix III](#)).

Any proposed closure will be made known to the ward staff, bed management and general management. Following a clinical risk assessment, the bay doors to all bays should be closed, and where possible fans removed, to further reduce airborne dissemination of the virus.

A bay closure option should be used to cohort norovirus symptomatic cases whilst minimising the risk of exposing others. Bay sharing of categories of patients should be as follows:

Patients categories in the bay	Possible Sharing Options
Bay contains a mixture of symptomatic possible or confirmed norovirus cases and exposed asymptomatic patients	<ul style="list-style-type: none"> • If sufficient single rooms are available, isolate case(s) in a single room(s) leaving exposed asymptomatic patients in the <u>closed bay</u> • Do not move out exposed asymptomatic patients to share a bay with non-exposed patients • If exposed asymptomatic patients have been discharged or are in alternative accommodation (but not with non-exposed patients), other possible or confirmed cases could be moved in to share the bay.
Bay contains exposed asymptomatic patients	<ul style="list-style-type: none"> • Do not move in symptomatic possible or confirmed cases • Can share accommodation with non-exposed patients if it is ≥ 48 hours since the exposed asymptomatic patients' last exposure to a possible or confirmed case *
Bay contains non-exposed patients	<ul style="list-style-type: none"> • Can share accommodation with other non-exposed patients • Can share accommodation with exposed asymptomatic patients if ≥ 48 hours since their last exposure to a possible or confirmed case *

***Confirm ongoing decontamination of exposed asymptomatic patient environments prior to sharing accommodation with non-exposed patients. Patients and staff should be cohorted, i.e. staff should be allocated to care for cases that are exposed or non-exposed.**

Exemption: In exceptional situations the risk to an individual patient of norovirus acquisition will be less than the risk of non-admission. In such exceptional events, when alternative possible accommodation for the patient has been excluded, the patient can be admitted to a closed ward, but the patient and/or relative must be informed of their personal norovirus risk. Such events should be recorded on the NHS Board's Risk Register as a risk to the patient.

6.2. Discharges

Patients may be discharged to their homes provided their relatives are aware of the norovirus situation in the ward, the personal risk to themselves and how this risk can be minimised, e.g. hand hygiene, washing of personal laundry and, norovirus information is provided. Patients should be advised that if symptoms develop after discharge, they should inform their GP of the situation in the ward.

(Discharges to care homes or discharge of patients with social care packages, i.e. where carers will visit the symptomatic patient and other asymptomatic patients, should also be treated as transfers).

6.3. Transfers

Avoid transferring any patient from a closed ward or bay to other hospitals/clinical areas/care homes unless there is a clinical priority. (If there is a clinical priority to move a patient the receiving clinical area must be fully informed of the norovirus situation in the transferring ward and the patient should be isolated on arrival in the receiving ward – even if asymptomatic). Contact Precautions still need to be used in the receiving clinical area.

6.4. Healthcare Workers (HCWs)

- **As far as it is possible for the duration of the outbreak:**
 - Allocate HCWs to care for either cases and exposed patients, or non exposed patients (i.e. allocate staff to affected bays or non-affected bays).
 - Do not allocate staff on the affected wards/bays to work on unaffected wards.
(Consider bank and agency staff as people who could inadvertently spread this infection throughout the hospital).
 - Do not allocate staff from unaffected wards areas to work in the closed wards or closed bays unless they are to remain so allocated for the duration of the closure.
 - If staff cannot be allocated to specific cohort areas, the ward may not be suitable for bay closure.
- HCWs should be aware of their duty to stay off work when they have symptoms of gastrointestinal infection (reporting sickness is also mandatory).

- HCWs with gastrointestinal symptoms should be sent off duty and not allowed to return to work until they are symptom free for 48 hours.
- HCWs should contact their Occupational Health Department for advice.
- Unless deemed clinically necessary, non-essential staff (e.g. physiotherapists, occupational therapists) should avoid visiting closed wards or closed bays – or at the very least avoid the symptomatic patients.
- Consideration should be given to stopping medical students entering closed wards.

6.5. Knowledge management

- Inform everyone who needs to know about the closed status of the ward/or bay including: Bed Management, IPCT, General Management, Consultants, Health Protection Team, etc. There should be local agreement on who gets daily updates during norovirus outbreaks.
- Have in place a system of at least daily updating via email to this group.
- Ensure all HCWs in the area are aware of how norovirus can be transmitted and their role in minimising the risks to patients and to preparing the ward for reopening. Cue cards listing the roles of different professionals during an outbreak may help reduce errors of omission and confusion.
- Provide patients and their visitors with oral and written information regarding the norovirus outbreak.

6.6. Immediate Risk Reduction

- If ward pantries or kitchens have doors, these should be closed and kept closed.
- Identify and advise the discarding of food (wrapped and unwrapped) throughout the ward which may have been contaminated by norovirus contaminated aerosols (from projectile vomit), e.g. fruit or sweets on patient lockers, open butter dishes in pantries.
- Avoid the subsequent exposure of food in the ward, on bed-tables and lockers and in pantries/kitchen.
- As cleaning alone is ineffective at removing norovirus, and can actually result in the transfer of the virus throughout the environment, in-use, and ready-for-next-patient-use equipment should be considered contaminated with norovirus, therefore:
 - Clean and disinfect all commodes, toilets and frequently touched surfaces with a neutral detergent and 1000 ppm available chlorine (av. cl.).
- Review ward equipment and remove any equipment that cannot be effectively decontaminated, e.g. damaged commodes or chairs with torn seat coverings. **NB** These should not be present even in a non-outbreak situation.
- Avoid exposing equipment to airborne norovirus contamination wherever possible, e.g. consider covering open disposables items with plastic sheets.
- As far as is possible stop using fans in the ward areas to further reduce airborne dissemination of the norovirus.

6.7. Specimens

- Send faecal specimens from symptomatic patients (and staff) for culture, *C. difficile* toxin testing and for virology. [Staff specimens to be sent with return label for Occupational Health Dept.]
- Use a Norovirus Outbreak Data Record to keep track of the patients that are and have been symptomatic, their symptoms, specimens that have been sent and the results that have been received. [Appendix II](#).

6.8. Hand hygiene

Hands are a key, but not the only, means of transmitting norovirus within the ward. As norovirus remains viable on surfaces that are touched for several days, HCWs must be mindful that hands can and will transfer the virus. In addition, hands can and will be contaminated with the virus during routine activities like touching doors, touching keyboards and at the nurses station, therefore:

- Do not use alcohol based hand rubs (ABHR) alone for routine decontamination of hands when there is an outbreak of gastro-intestinal infection. Perform hand hygiene using liquid soap and warm water.
- ABHRs can be used after a hand wash with liquid soap and warm water prior to performing an aseptic technique (Moment 3).

6.9. Personal Protective Equipment (PPE)

- Use Personal Protective Equipment (PPE) gloves and aprons to prevent personal contamination with body fluids.
- HCWs must be mindful that anyone wearing gloves and an apron and coming into contact with spillages or contaminated surfaces can disseminate norovirus by glove contact on clean surfaces.
- On removal of PPE hands must be washed with liquid soap and warm water.
- As per [Standard Infection Control Precautions](#), during any procedure, where there is a risk of splash, e.g. when decontaminating spillages of faeces or vomit, in addition to gloves and apron, a surgical mask may be worn to minimise the risk of splash contamination and inhalation of norovirus and subsequent ingestion.
- Discard PPE waste as Healthcare (including Clinical) Waste.

6.10. Decontamination of the Environment

- Increasing the hours available for cleaning of the ward is a key consideration for the IPCT to advise on. Consideration should be given as to how frequently cleaning should be done based on the outbreak presentation and ward layout.
- Cleaning using wet cloths can be a means of transferring the virus throughout the ward. The IPCT should be assured that the methods of cleaning, the intensity of cleaning and the route of cleaning –

unaffected to affected areas – is optimal to minimise the risk of ongoing transmission of noroviruses.

Domestic staff should therefore report to the nurse in charge every morning for any additional or change to cleaning regimens.

- For each patient bed space a single use disposable cloth should be used.
- Wherever possible the cleaning with a detergent and warm water should be followed with 1,000 ppm av cl or combined chlorine/detergent based product. **NB In order to prevent further transmission and also to protect those who have not been exposed the entire ward area should be decontaminated by cleaning followed by 1,000 ppm av cl or combined chlorine/detergent based product. Not just a closed bay.**

NB not moving staff between affected and non-affected clinical areas applies to domestic staff.

6.11. Decontamination of spillages of faeces or vomit

- Wear Personal Protective Equipment gloves, apron (and surgical mask if there is a risk of splashing).
- Requirements: healthcare waste bag, spill kit or wet and dry paper towels, fresh solution of 1,000 ppm av cl.
- Use dry or wet paper towels to remove all vomit or faeces and discard immediately into healthcare waste bag.
- Clean the area using fresh disposable paper towels and a general purpose neutral detergent (application of a disinfectant to faeces/or vomit will inactivate it).
- Disinfect the area with 1,000 ppm av cl – following the manufacturer's instructions for surface disinfection
- Dry the area thoroughly.
- Discard all disposables including gloves and apron immediately into healthcare waste bag and then wash hands with liquid soap and warm water and dry.

6.12. Laundry

During an outbreak all laundry coming from a ward or bay which is closed should be considered potentially contaminated and discarded directly into alginate bags and then subsequently re-bagged.

6.13. Visitors

- There should be an approved notice on the ward door to first alert visitors to the possibility of a norovirus, or diarrhoea and vomiting, outbreak.
- The notice should advise visitors to perform hand hygiene, i.e. on entering the ward, on leaving the ward and not to put fingers in their mouth or consume food or drink whilst in the ward. These messages should be reinforced to visitors by a member of the ward team.
- Visitors should for their own safety be advised:
 - To reduce the number of visits whilst the outbreak lasts.

- Not to visit if they themselves are suffering from an infection and until they are 48 hours symptom free.
- That children should not visit the ward during an outbreak.
- That they should not visit people in other wards.
- If more wards are closed consider the restricting visitors to other areas of the hospital.

Temporary suspension of visiting (TSV): A TSV may be considered necessary to reduce the risk of the norovirus outbreak spreading throughout the hospital. Advice on communicating this to visitors is available from HPS.

6.14. Daily Patient Placement & Bed Management

- Patient placement assessments should be done on a daily basis.
- Patient placement decisions during a norovirus outbreak require local IPCT and clinical team assessment of the options with the least risk for all the patients.
- The variables that will assist the IPCT and clinical team in making patient placement decisions with the best options for patient safety include: the number of symptomatic possible or confirmed cases, the number of patients who are vomiting, the ward layout (cubicles, beds per bays or nightingale ward areas), the availability of commodes, hand hygiene facilities, toilets and en suite facilities, the sex mix on the ward, the vulnerability of patients who are not currently affected, current occupancy rate and the duration of symptoms. The following are guidelines:
 - Patients who are vomiting pose most risk – if possible isolate these patients in a single room and keep the door closed.
 - If there are more symptomatic patients than available single rooms, cohort nurse symptomatic patients together in bed bays. ([Follow 6.1](#)).
 - Do not move patients if it places unexposed asymptomatic patients at risk of exposure.
 - As the number of cases decreases it may be that one or two patients remain symptomatic longer than others. When available, these symptomatic patients can be moved into single rooms or into a bed bay(s) to further reduce spread, and aid containment of norovirus.
 - Even though an entire ward has been closed it may be reopened bay-by-bay, on the advice and risk assessment of the IPCT **See:** [Reopening the ward by bays](#).

Empty Beds in closed bays or wards: As patients are discharged, the linen on the beds should be removed and the bed, bed table and locker cleaned with neutral detergent and water and then dried. These beds should not be re-made until the terminal clean commences. **Create clean bays** – as patients are discharged, try to create clean bed bay areas, where patients can be admitted to first once the ward/bay is reopened. **See:** [Reopening the ward by bays](#).

6.15. Terminal cleaning

During the terminal clean, all empty beds should be **re-cleaned and the bed cleaning process should include 1,000ppm av. cl.** or with a combined chlorine/detergent based product. After the terminal cleaning has been completed, the beds can then be remade. The rationale for this is that noroviruses could survive for up to a week on cleaned beds and on clean bed linen, and also to prevent the need for the double use of hypochlorite solution.

- The terminal clean can start when the 48 hour period of no new cases and no norovirus symptoms is completed.
- When terminal cleaning commences should be pre-agreed with the IPCT.
- The IPCT should provide a ward with a terminal clean procedure that specifies not just how things should be cleaned, disinfected or disposed of and dried, but also the order in which this should be done. (There should be clear agreement on who does what with regard to the terminal clean tasks).
- Terminal cleans should involve a change of curtains in bays where cases have been cared for. (Pre booking in advance a planned curtain change may also reduce time to re-opening).
- Again the order of curtain change within the terminal clean procedure should be specified. Ideally the order should be as follows:
 - Remove all curtains where cases have been nursed – this can be done as the beds or bays become empty.
 - Remove all bed linen from unoccupied beds – this can be done as the beds become empty.
 - Decontaminate all care equipment in line with manufacturer's instructions. Wherever possible use thermal decontamination.
 - Thoroughly clean and then disinfect all surfaces with a neutral detergent and 1,000 ppm av cl. or use a combined chlorine/detergent based product.
 - Once the decontamination procedures are complete the curtains can be re-hung and the beds re-made.

6.16. Reopening the ward by bays

Although an entire ward may have been closed to admissions, as the outbreak wanes the closed ward can be reopened bay-by-bay provided:

- The bays are free of symptomatic patients (48 hours) and there have been no new cases for 48 hours, or
- The bays have become empty of all patients, AND
- The bay has been deep cleaned, AND
- Staffing and remaining patient placements/facilities and assessments enable the IPCT to confirm it would be safe to do so.

To ensure that a bay closure option and a reopening the ward by bays, option does not prolong outbreaks, data on the duration of restricted admissions, type of closure (bay or ward) and bed days lost should be collated for all wards where there are restricted admissions. This assessment could be done using a Norovirus diary.

Reopening of a ward can commence when:

- The ward has been terminally cleaned to the satisfaction of the ward manager and IPCT **and**,
- There have been **no** new cases of possible norovirus for 48 hours **and**,
- There has been no vomiting or diarrhoea for a full 48 hours which is considered to be caused by norovirus.

6.17. Norovirus Management - Patient Care Measures

Patient care

- Commence all symptomatic patients on a stool and fluid balance chart to monitor for possible dehydration.
- Report to medical staff if any patient's clinical condition suggests rehydration may be necessary.

Patients & Relatives

- Ensure all patients and relatives are aware of the situation regarding the outbreak and what they can do to prevent additional personal risk.
- Provide written information, e.g. how to wash personal laundry, how to wash hands, restricting visitors during an outbreak.

7. Escalation Plan – Additional Control Measures when norovirus outbreaks are continuing or are spreading

When Norovirus Control Measures fail to stop an outbreak, or the outbreak spreads to other areas of a hospital there are likely to be one of two reasons for this:

- The Norovirus Control Measures have not been applied correctly (inability to implement or failure to comply).
- The Norovirus Control Measures are insufficient to prevent outbreaks or outbreak continuation.

Given the above, the Escalation Plan focuses on finding out, if possible, what is causing the escalation or failing to stop the outbreak. Sometimes the number of patients arriving into hospital with symptoms of norovirus can trigger multiple outbreaks and the need for the Escalation Plan to be triggered.

7.1. Investigations to identify what is causing the norovirus escalation or failing to stop an outbreak:

- **Have the control measures been implemented correctly?**
- Look for evidence that:
 - Restricted admissions (bed bay or ward closures) have remained closed to admissions and transfers
 - All on-duty staff are asymptomatic
 - Visitors are asymptomatic
 - There is control of ward traffic.
- Review and seek reassurance on the following infection control indicators:
 - Ward cleaning – including ward cleaning records
 - Ward cleanliness – including safe patient environment audit data
 - Hand hygiene practices – undertake hand hygiene audits
- Determine if there have been any admissions to a closed ward(s).
- Determine if there are high levels of norovirus infection in the community (See HPS weekly Norovirus Point Prevalence data and NHS 24 data).

If the situation is a failure to apply Norovirus Control Measures effectively, when there are the resources and facilities to apply them correctly, then every effort should be made to instigate and rigorously apply the Norovirus Control Measures

If the situation is being caused by a failure to apply the Norovirus Control Measures because they can't be applied at present, e.g. emergency admissions requiring hospital accommodation and closed wards being the only accommodation option, the Escalation Plan may assist in gaining control of the situation.

7.2. Escalation Plan – When Norovirus Control Measures cannot be applied

- Expand the Outbreak Control Team (OCT) managing the norovirus outbreak(s). Get together a high level outbreak control team including: bed management, general management, risk management, infection control, occupational health and clinical services
- Produce and update an epi curve of all new cases in each ward each day – and an overall epi curve of all new cases in all wards. This will enable OCT to monitor the success of the decisions they make regarding outbreak management. (This can be done from the HPS Norovirus Tracker).
- Monitor the norovirus situation in the community by using the HPS Norovirus Point Prevalence data – this may help the decision making.
- The OCT should meet at least daily to monitor the changing impact of norovirus on the hospital, its staff and patients and to assess the success or otherwise of their actions.
- Undertake an asset assessment of all ward facilities possibly available for reconfiguring wards.
- Consider all options for possible ward configurations that would ease pressure and the number of empty beds in closed wards.
- Agree ward configurations for optimal patient safety and optimal maintenance of services. (This may include amalgamation of symptomatic cases in a single ward to allow deep cleaning and reopening of some areas more quickly).
- Liaise with neighbouring NHS Boards if this could help the local situation.
- To reduce the number of closed wards, consider opening a ward for all patients with diarrhoea on admission and patients with possible or confirmed norovirus infection.
- Consider creating a ward for patients admitted without diarrhoea - deep clean pre use.
- Ensure that accident and emergency departments have advice leaflets for patients presenting with symptoms suggestive of norovirus who do not require admission.
- Consider communicating with GPs to ensure awareness of the situation within care homes/hospitals and to avoid any unnecessary admissions.
- Consider whether staff who are returning from being on sick leave due to norovirus could work in norovirus affected wards rather than in wards that have not yet been affected.
- Medical staff and those who work in both affected and non-affected wards should consider how they can best work so that they reduce the potential for cross-transmission, i.e. can these staff work only in affected or unaffected areas until the situation is over.
- Promote hand hygiene by all HCWs and visitors.
- Ensure cleanliness is as specified by the IPCT
- Consider extending the ward closure time to 72 hours after last vomit/diarrhoea episode.
- Consider temporarily switching hospital wide, detergent to a hypochlorite agent for standard cleaning in non-outbreak wards to cover duration of outbreak.
- Consider asking HPS for advice.
- Continue to assess the impact of the outbreak using the HIIAT and report onwards as required.

- Provide public messages through the media about not coming to hospital if symptomatic, or not visiting more than one ward at a time, and generally what to do to reduce spread if people get diarrhoea/vomiting in the community.
- Consider closing the hospital, or areas of the hospital, to all but essential visitors, i.e. a **Temporary Suspension of Visiting (TSV)**. If this is considered necessary, agree before restricting visitors, identify the criteria would for returning to normal visiting. Before closing the hospital to all but essential visitors ensure communications internally and externally (public, media, HPS and SGHSCD). Wherever possible advise visitors about the restrictions before they arrive for visiting. HPS has produced advice on communicating a **TSV to patients, staff and visitors**.

NB Maintain effective communications: patients, staff, visitors, community, HPS, SGHSCD.

7.3. Other practical considerations for clinical and infection control teams

- **Once the closed ward has re-opened ward staff should:**
 - Admit patients to empty terminally cleaned bay areas first.
 - Be alert to the possibility of the outbreak reigniting and be ready to re-institute control measures.
 - Continue to provide additional cleaning advice to domestic staff.
- **IPCTs:** should be alert to warnings of increases in norovirus activity through the HPS weekly Monday Prevalence and NHS 24 exceedance reports. Advise medical receiving teams when the norovirus risk is high.
- **Bed Management Liaison and IPCTs:** must work closely together to ensure optimal patient safety for all patients. Early communications and pre-planning of re-opening should assist in reducing the impact of norovirus outbreaks.
- **Hospital IPCTs and Health Protection Teams (HPTs):** should communicate effectively to share information on local closures due to norovirus.

8. Local Norovirus Outbreak Summary Report

Below is a simple summary report format completion of which will enable IPCTs to swiftly write a report and assess its recognition, its impact and its management.

Hospital	
Directorate/department	
Ward	
Case definition	<p>Possible Norovirus Infection Case:</p> <ul style="list-style-type: none"> ○ A person (patient or staff) who, within a 24 hour period has, 3 or more episodes of non-bloody diarrhoea*, AND/OR, 2 or more episodes of vomiting, without having any other obvious cause for symptoms. <p>Confirmed Norovirus Infection Case:</p> <ul style="list-style-type: none"> ○ A person (patient or staff) who, within a 24 hour period has, 3 or more episodes of non-bloody diarrhoea*, AND/OR, 2 or more episodes of vomiting, without having any other obvious cause for symptoms AND who has tested positive for norovirus in RT-PCR.
Date first case	
Date reported to IPCT	
Initial HIIAT assessment	Green, Amber, Red
Admission restrictions	Bay Closure from / / to / / Ward Closure from / / to / /
Bed days lost	Estimate:
Was an escalation plan required?	
Did virology confirm the outbreak?	
Total number of patient cases with symptoms? (attack rate if possible)	
Total number of staff cases	
What were the consequences to the affected patients? (e.g. any patients requiring intravenous rehydration due to norovirus causing dehydration)	
What were the consequences to the non-affected patients, e.g. delays in admissions?	
Consequences to other areas of the hospital?	
Was there any non-compliance with guidance, e.g. admissions to closed bed bay(s)/ward, reopening of the ward against IPCT advice, transfer of staff to other non-affected wards?	

Was there an event recognised which could have started the outbreak, e.g. transfer from another area – if so could this have been anticipated and averted?	
What went well?	
What actions/systems could be improved?	

8.1. Possible summary for annual report on norovirus outbreaks

The table below provides IPCTs with a format that could be used in their annual infection control reports of local surveillance of Norovirus outbreaks. It may help in determining the epidemiology and to summarise impact and performance compliance.

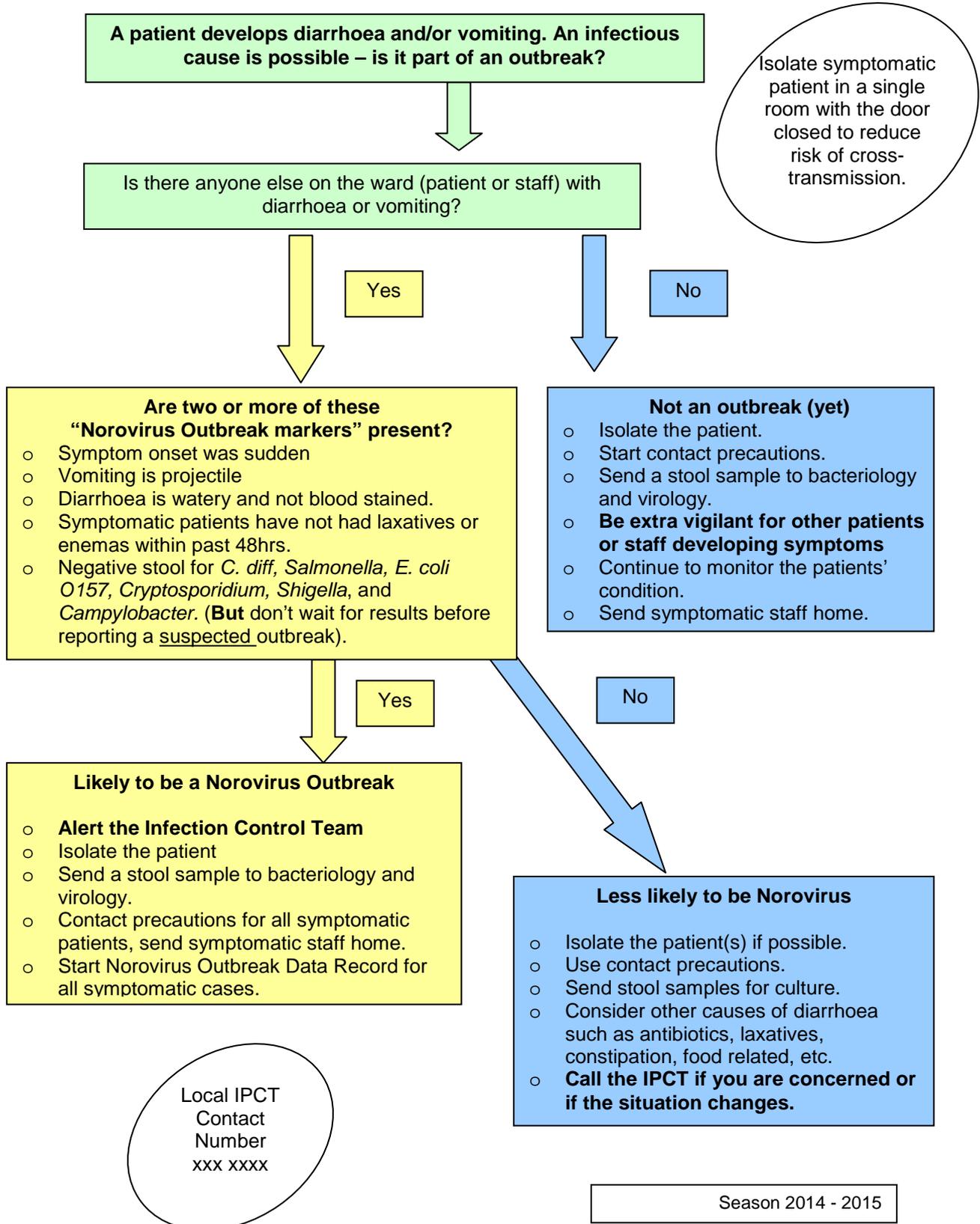
Total number of outbreaks – by directorate	
Total number of patients affected	
Total number of staff affected	
Number of bay closures that did lead to full ward closure	
Number of full ward closures	
Average duration of bed bay(s) closure	
Average duration of ward closure	
Assessment of what went well during outbreaks	
Assessment of what did not go well during outbreaks	
Identified system changes that could reduce risk of norovirus outbreaks	
Any non-compliance with infection control advice during outbreaks	

9. Useful sources of information and references

- (1) Hall AJ. Noroviruses: the perfect human pathogens? *J Infect Dis* 2012 Jun;205(11):1622-4.
- (2) Health Protection Agency, British Infection Association, Healthcare Infection Society, Infection Prevention Society, National Concern for Healthcare Infections, NHS Confederation. Guidelines for the management of norovirus outbreaks in acute and community health and social care settings. Health Protection Agency 2012 March [cited 2012 Feb 15]; Available from: URL: http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317131647275
- (3) Harris JP, Edmunds WJ, Pebody R, Brown DW, Lopman BA. Deaths from norovirus among the elderly, England and Wales. *Emerg Infect Dis* 2008;14(10):1546-52.
- (4) Said MA, Perl TM, Sears CL. Healthcare epidemiology: gastrointestinal flu: norovirus in health care and long-term care facilities. *Clin Infect Dis* 2008 Nov 1;47(9):1202-8.
- (5) Vanderpas J, Louis J, Reynders M, Mascart G, Vandenberg O. Mathematical model for the control of nosocomial norovirus. *J Hosp Infect* 2009 Mar;71(3):214-22.

10. Appendix I - Is it an outbreak? A decision tree to help clinical staff

Outbreaks can start abruptly and spread quickly – to minimise their impact on patients and the hospital they must be recognised, reported and controlled very swiftly.
This flow chart will help you make the right decision.



11. Appendix II Norovirus Outbreak Daily Checklist/Norovirus Outbreak Data Record

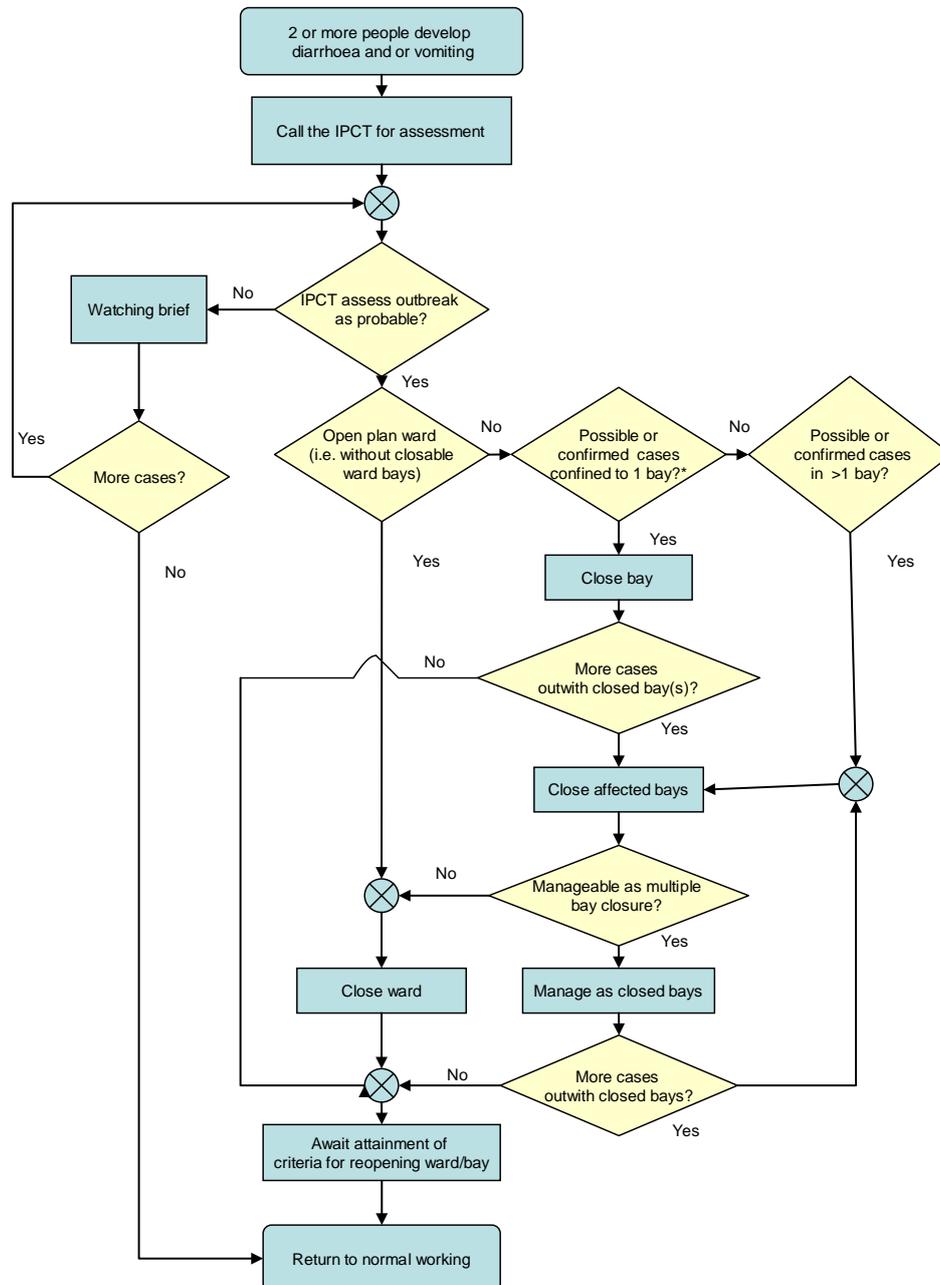
Hospital _____ informed date:	Ward: _____	IPCT	Shift/day							
Ward/bay(s) closed to admissions and transfers – until 48 hours after last new case and 48 hours after last diarrhoea/vomit. The ICD may based on specific epidemiological data extend the closure time.										
Ward / side-room / bay doors are closed ; there is an approved notice on the ward door advising visitors what to do.										
All Healthcare Workers (HCWs) on the ward are: <ul style="list-style-type: none"> ○ Aware of the status of the ward and how norovirus is transmitted. ○ Norovirus symptom free. ○ Allocated – if possible – to care for either affected or non-affected areas of the ward – including agency and bank staff. 										
All patients (and relatives) on the ward are aware of the norovirus situation and have been given information leaflets on norovirus and the need for hand hygiene, and safe handling of personal laundry.										
All patients with symptoms of norovirus have been assessed today for symptom severity and assessed for signs of possible dehydration (Stool and Fluid Balance charts).										
Norovirus Outbreak Data Record (overleaf) The outbreak data collection record has been updated – including any new cases, the symptoms patients are experiencing today and laboratory data. (Stool samples have been requested from all symptomatic patients).										
Patient Placement Assessment: A patient placement assessment and any advised / suggested moves have been made.										
Personal Protective Equipment (PPE) –gloves, apron, surgical (mask/visor – if risk of facial contamination with aerosols). There are sufficient supplies of PPE in the ward <ul style="list-style-type: none"> ○ PPE is used for single tasks <u>and once removed hand washing is performed using liquid soap and warm water.</u> ○ PPE is used before contact with the patient or the patient’s immediate environment or before any dirty task. 										

Hand hygiene is being carried out with liquid soap and warm water – this can be followed by alcohol based hand rub.									
Hand hygiene: Patients are encouraged and given assistance to perform hand hygiene before meals and after attending the toilet.									
Environment: There is increased cleaning of the environment including frequently touched surfaces, with neutral detergent and 1,000ppm av cl. [Cleaning records are up to date.]									
Environment: There is no wrapped or unwrapped food in the clinical ward area – even if unexposed all fruit should be washed before eating.									
Equipment: Where possible single patient use equipment is used and communal patient equipment avoided. All reusable equipment is decontaminated after use. There are sufficient other sundries for effective control measure implementation.									
Linen: Whilst the ward remains closed, categorise all discarded linen as “infected”.									
Spillages: All faecal and vomit spillages are decontaminated by staff wearing PPE. The spillage is removed with paper towels, and then the area is decontaminated with an agent containing 1,000 ppm av cl. All waste arising is discarded as healthcare waste. PPE is then removed and hands washed with liquid soap and warm water.									
Advice and Guidance: HCWs have access to, and follow NHS Board guidance on: <ul style="list-style-type: none"> ○ The decontamination of body fluid spills, equipment, soft-furnishings ○ What to do if uniforms become contaminated. 									
Today the IPCT has made an assessment of the outbreak and the continuing need for ward closure. The earliest possible date for reopening has been communicated to the clinical team, to bed management staff and to those listed in the Outbreak Policy.									
• In preparation for reopening – empty beds have been cleaned but left unmade.									
• In preparation for reopening – the curtains in empty rooms have been taken down.									
• In preparation for reopening – consider requirement for pre-booking a terminal clean and curtain change.									
• Before reopening: a terminal clean has been performed following IPCT recommendation and the hospital procedure.	n/a	n/a							

* Does the patient meet the definition of a Possible or Confirmed case?

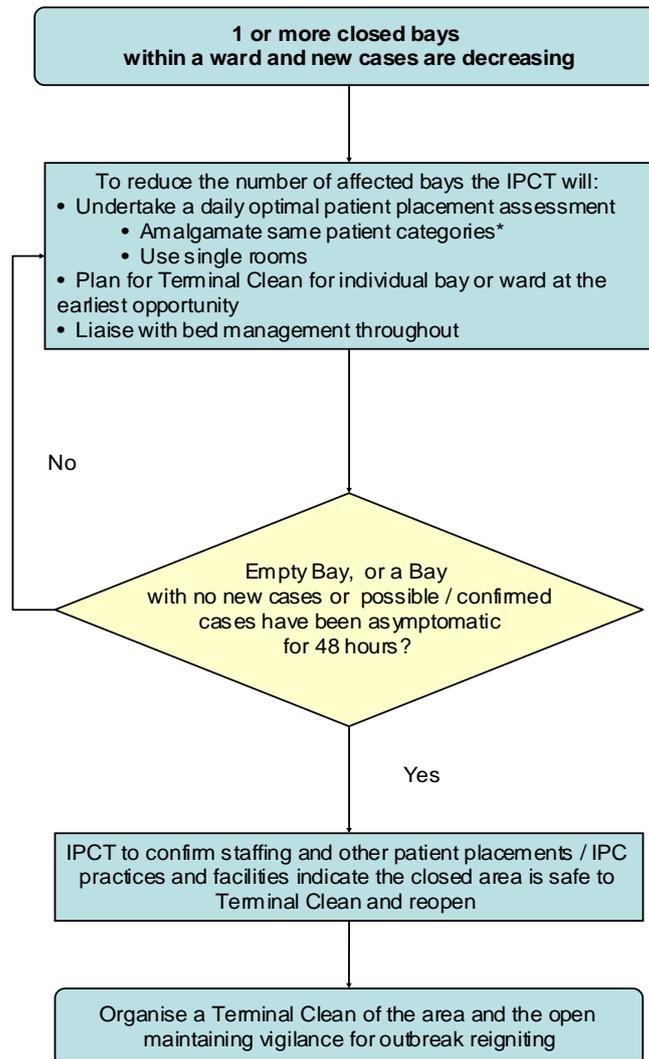
Date (agree a time of day to be done)										Comment
No. of patients symptomatic										
No. of patients <48 hrs symptom free										
No. of empty beds										
No. of new HCWs off duty with symptoms										
No. of bays with symptomatic patients										

12. Appendix III Algorithm for Ward or Bay Closure



- *'Possible or confirmed norovirus cases confined to 1 bay', means that these cases were in the same single bay when their symptoms arose, and they are in the same single bay now. It does not mean that the additional possible or confirmed norovirus cases have been moved from separate bays to a single bay to facilitate a single-bay closure.
- For a bay closure option to be successful, it is important that same category patients are cared for together in the same bay, i.e. all *symptomatic possible or confirmed cases* together, or all *exposed asymptomatic patients* together, or all *non-exposed patients* together. **Also** that, wherever possible, staff are allocated to care for specific patient/bay categories for the duration of restrictions. NB although only a bay is closed, the decontamination measures should apply to the entire ward.
- **Exposed asymptomatic patients** can remain in the same bay where exposure to the possible or confirmed norovirus cases occurred, i.e. with possible or confirmed cases.
- **Exposed asymptomatic patients** can be cared for with *non-exposed patients* **if** it is 48 hours after their last exposure, and of course, they have remained asymptomatic.

Appendix IV Algorithm for Ward or Bay Re-opening



*Amalgamating the same category patients means caring for patients that are: *All symptomatic possible or confirmed cases* together or, *all exposed asymptomatic*** patients together, or *all non-exposed* patients (non-exposure in the ward, or within the past 48 hours anywhere) together.

- Do not amalgamate exposed asymptomatic patients with non-exposed patients **unless** it is 48 hours after their last exposure, and of course, they have remained asymptomatic.
- **Exposed asymptomatic patients** can remain in the same bay where exposure to the possible or confirmed norovirus cases occurred, i.e. with possible or confirmed cases, but should not be exposed to new cases.

** Confirm ongoing decontamination of exposed asymptomatic patients' environments prior to sharing accommodation with non-exposed patients. See [Decontamination of Environment](#) and [Decontamination of Spillages of Faeces or Vomit](#).