SWANSEA BAY PORT HEALTH AUTHORITY

NOROVIRUS ON SHIPS:

Cleaning / Decontamination procedures

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Please refer to the MCA / APHA / HPA publication 'Guidance for the Management of Norovirus Infection on Cruise Ships' for further detail.

Methods

All cleaning activities should be undertaken in a methodical manner following hygienic principles so as not to re-contaminate decontaminated areas. All cleaning activities should be adequately supervised 'in house' with regular inspections to ensure correct procedures are being adhered to and that there is no risk of cross-contamination form 'dirty' to 'clean' areas.

Thorough and continuous cleaning and disinfection should be carried out. Cleaners should target general hand contact surfaces such as hand rails, door handles, toilet flush handles, tap handles, etc. and also where passengers sit or lie down. Separate teams of cleaning staff should be used to clean known potentially contaminated areas e.g. where there have been previous vomiting accidents in public areas or cabins (there should be records kept of these incidents).

1 Hard Surfaces

All hard surfaces should be cleaned using a suitable detergent or multipurpose cleaner and then disinfected using either 1000ppm hypochlorite solution or an alternative effective virucidal disinfectant.

Separate disposable cloths must be used for 'dirty' areas such as toilets.

After cleaning, bathrooms cloths must be placed in sealed bags and disposed off. Staff must not use the same cloths to clean the rest of the accommodation. Damp rather than dry dusting or sweeping should be performed. During wet cleaning, cleaning solutions and equipment soon become contaminated. Therefore a routine should be adopted that does not redistribute micro-organisms. Cleaning solutions and cloths/mops should be changed frequently. Cleaning solutions should be disposed of to minimize spray and mops disinfected after use.

2 Soft Furnishings

If items are heat tolerant, after initial cleaning with hot water and detergent, this should be followed by steam cleaning which reaches a minimum of 70oC. If this is not possible, disinfect using a suitable effective virucidal disinfectant. If covers are removable they should be laundered at 70^{o}C.

3 Carpets

Carpets should be steam cleaned (or steam vacuumed) using a steam cleaner which reaches a minimum of 70°C, unless the floor covering is heat sensitive and/or fabric is bonded to the backing material with glue. If this is the case then use a suitable effective carpet shampoo, ideally with virucidal properties. Carpets should be allowed to dry before any crew or passenger is allowed back into the area. Vacuum cleaning carpets and buffing floors have the potential to re-circulate Norovirus and are therefore not recommended. If vacuum cleaners are used in decontaminated areas they should contain high efficiency particulate air (HEPA) filters which are regularly cleaned and disinfected.

4 Laundry

Laundry from affected persons must be kept separate from all other laundry. All laundry items from affected rooms should be placed separately in water soluble bags before transfer to the laundry. All dirty linen should be bagged at the site of collection. During the transfer of laundry bags, there must be no risk of cross contamination en route. Water soluble bags should be used for all instances of gross contamination. If linen is soiled with body substances e.g. faeces, it should be washed separately, with a pre-wash sluice cycle. All soiled linen should be washed as promptly as possible. Alternatively, heavily soiled linen should be disposed of in a sealed bag. This must comply with waste disposal regulations and PHA arrangements.

If an external laundry service is used, procedures should ensure operators are informed of the likelihood of contaminated bedding, etc and any special requirements for the receipt of such items must be identified. Fabrics which can tolerate it should be washed at a minimum temperature of 70oC. This should be attained for at least three minutes: other fabrics may be disinfected by the addition of sodium hypochlorite to the penultimate rinse. This should be of at least five minutes' duration, at a concentration of at least 150ppm of chlorine. Separate linen carts should be used for dirty and clean linens. Carts used to transport soiled linens should be cleaned and disinfected after each use. On change-over, affected accommodation must be thoroughly cleaned and sanitised prior to clean laundry being brought into the room.

5 Precautions to be taken by cleaning staff

Precautionary measures should be taken by housekeeping personnel. Disposable personal protective equipment must be used, including gloves and aprons. These should be changed after each cabin. Hands must be thoroughly washed and dried before entering the next cabin.

6 Food and beverage procedures

Cleaning and disinfection of all dining areas and bar seating areas including table-tops, chair-arms, hand rails, equipment buttons, handles and any other hand contact surfaces should be carried out on a continual basis. Galleys and pantries should be similarly cleaned using a safe and effective disinfectant. All food must be protected to prevent any risk of contamination. All food service personnel must frequently wash their hands and protect food effectively. This should be carefully supervised and checked. Other precautions include ensuring separation of clean and dirty tableware, discarding all displayed food at the end of service, changing tongs and utensils regularly and ensuring passengers do not return to buffets and reuse dirty tableware.

7 Air systems

Air handling units and evaporative condensers should be inspected to check there are no faults. Any damaged or worn filters should be replaced and supplementary cleaning and disinfection is

recommended. Ventilation, including any air conditioning system, should be set at the maximum level for the introduction of outside air and the minimum level of re-circulation.

8 Public toilets

Public toilet facilities throughout the vessel should be checked every hour and cleaned as appropriate. They must be thoroughly cleaned and disinfected at least 4 times a day, and more if possible. The disinfectant recommended is 1000ppm hypochlorite solution. All hard surfaces must be cleaned and disinfected ensuring that separate disposable cloths are used for 'dirty' areas such as toilet bowls. All dirty cloths should be disposed of in sealed bags.

9 Children's clubs / creches

Particular attention should be taken in the cleaning of children's play clubs. Uncontrolled vomiting and diarrhoea is more likely in young children and therefore the play area and toys may be heavily contaminated. All the area and contents should be cleaned and disinfected daily and immediately after an incident of vomiting and diarrhoea. Toys in children's clubs should be capable of withstanding disinfection. Ball pits/pens should be cleaned and disinfected. The disinfectant recommended is 1000pmm hypochlorite solution. Tables and highchairs should be cleaned and disinfected. Nappy changing areas, toilets and hand washing facilities should be thoroughly cleaned and disinfected in all cases. The disinfectant recommended is 1000ppm hypochlorite solution. Blankets, sheets, pillow cases should be laundered at 70^{o}C as described above. If a hot wash is not possible, fabrics may be disinfected by the addition of sodium hypochlorite to the penultimate rinse. This should be of at least five minutes' duration, at a concentration of at least 150ppm of chlorine as described above.

10 Passenger and crew cabins

Beds should be stripped and whilst in the cabin all linen and pillowcases should be placed in the laundry bags. If the linen is heavily contaminated, the use of dissolvable bags is advised. Soiled linens should be handled as little as possible and with minimal agitation. The linen bags should be removed to laundry ensuring there is no risk of cross contamination en route. Clean linen should not be taken into an affected room before it has been decontaminated.

Any beverage sachets such as coffee, tea, sugar, biscuits etc. should be disposed of. All cutlery, crockery and glasses should be placed in a lidded container to be washed and disinfected using a dishwasher at a temperature of at least 70^{o}C.

All toilet rolls and other toiletries should be replaced and the partly used materials disposed of. The holders should be cleaned and disinfected as per 1 above.

All soft furnishings, i.e. chairs, stools, beds, upholstery, headboards must be cleaned and disinfected as per 2 above.

All hard surfaces, i.e. chair and table legs, window frames, dressing table, bedside tables, TVs and units, door knobs, wardrobes, handles, inside drawers and wardrobes, headboards, all bathroom fitments, handles, towel rails, waste bins, etc. must be cleaned and disinfected as per 1 above.

All carpet areas must be cleaned and disinfected as per 3 above. The bed can be made up and towels, soap etc. put in the cabin. The exception being if cabin is to be fogged, this should be delayed until completed.

11 Fogging procedure

If fogging is being undertaken, it should be done after the cabin has been thoroughly cleaned as per 4 above. Fogging must take place before changing linen (prior to clean linen being taken into the room) and before crockery and beverages are replaced. If there are any open-able windows they must be closed during fogging operations. Air conditioning unit should be disabled. Wardrobe doors and all

drawers should be opened. The door to the bathroom should be opened and fire alarms and smoke/heat detectors covered. The person operating the unit should methodically work backwards from the furthest point from the door aiming the fogging generator upwards ensuring all surfaces are covered with a light vapour. The operator should aim the fogging generator into any cupboards, bathroom and under beds. The door should be closed and left as per manufacturers instructions; this is usually for 45-60 minutes. The room should then be re-entered and all hard surfaces wiped with a multi purpose cleaner. Fire alarms and smoke/heat detectors should be uncovered.

12 Hand hygiene

12.1 Hand washing with soap and water

Norovirus can remain viable on hands for hours thereby giving hands the potential to spread the infection both directly and indirectly. Hand washing is therefore the single most important procedure for preventing the spread of infection. Hand washing with soap and water should be promoted, and sufficient hand washing stations should be strategically placed around the vessel to enable passengers to wash their hands, for example before eating. Where possible, non hand operable taps and soap dispensers should be provided to help prevent re-contaminating clean hands. Passengers and crew should be provided with instructions for proper hand hygiene. These should include instructions to turn taps off using disposable paper towels, where taps are hand operable, to prevent re-contaminating clean hands.

12.2 Disinfection with alcohol hand rubs/gels

In outbreaks hand gels / rubs should be considered as an adjunct to hand washing and NOT a replacement. Alcohol-based hand rubs are generally very effective against bacteria and enveloped viruses, providing an overall 3-4 log10 (99.99%) reduction. However non-enveloped viruses, such as Norovirus are more resistant and are typically only reduced by 1-2 log10 (90-99%) with a 30 second contact time. A product providing less than 2 log10 (99%) is not considered an effective hand disinfectant. Alcohol-based hand sanitisers can contain various alcohol combinations and concentrations. Studies have shown that ethanol is more effective against FCV than propanol, and it has also been shown that higher ethanol concentrations in commercially available hand rubs is associated with better efficacy against FCV. Generally only very high concentrations of ethanol can reduce FCV by >2 log10 (99%) after 30 seconds (12). Other studies have shown isopropanol at 50-70% to be effective against FCV (10, 11). Recent studies have found that a new synergistic formulation *(Manorapid synergy®)* with reduced ethanol content (55%) in combination with 10% propan-1-01, 5.9% propan-1.2-diol, 5.7% butan-1.3-diol and 0.7% phosphoric acid produced a reduction factor of 2.38 log10 after 30 seconds against FCV (13).

13 Disinfectant agents

When it comes to disinfecting surfaces, sodium hypochlorite remains the 'gold standard'. However, the problem for cruise ships is that there are sensitive environmental surfaces such as carpets and furnishings that could be damaged by hypochlorite. Other disinfectant agents have been developed that are less damaging to furnishings and are now commonly used by the cruise ship industry. Shipping companies should request independent testing data from the manufacturer or distributor of the disinfectant that supports their efficacy against Norovirus. As Norovirus cannot be grown in culture, efficacy testing of disinfectant is done using a surrogate virus, typically the FCV a similar non-enveloped single stranded RNA virus. A Log10 reduction of 4 (99.99%) or greater is considered adequate for FCV/Norovirus disinfection.

Disinfectant products usually have both pluses and minuses, for example, some very effective products against Norovirus have drawbacks such as being toxic or irritant to humans. Where as some non-toxic products require very long contact times on environmental surfaces to be fully effective against Norovirus. Alcohol based disinfectants are generally not very effective against non-enveloped viruses such as Norovirus/FCV.(3) Their use as a surface disinfectant is therefore not recommended, however, some alcohol-based hand disinfectants may be of use as an adjunct to hand washing, see 12 above.