BC Centre for Disease Control

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1.0 PURPOSE

To provide guidelines for the exclusion and microbiological clearance of cases and contacts of cases with enteric infections who are working in or attending high risk settings.

2.0 GOALS

To reduce the risk of enteric disease transmission from cases and their contacts in high risk settings by:

- Providing definitions of high risk settings and occupations to allow consistent application of exclusion guidelines across the province
- Outlining when cases and their contacts should be excluded from a high risk setting
- Setting conditions for cases and their contacts to return to the high risk setting
- Providing documentation to facilitate communication between the case, physician, public health and the employer or administrator of the high risk setting
- Providing a tool for assessing the personal hygiene levels of food handlers

Although the priority was to minimize the risk to public health, a conscious effort was made to avoid unnecessary hardship on cases and their contacts.

3.0 METHODS

Literature search: The scientific literature was searched using Medline and the reference sections of studies that were retrieved. Keywords used in the search included: food handler, food handler illness, food handler outbreak, food handler exclusion, worker exclusion, day care worker, health care worker, *S*. Typhi, *S*. Paratyphi, *Schistosoma*, carriage, excretion.

Policy scan: Existing exclusion policies from British Columbia, other Canadian provinces, the Public Health Agency of Canada (draft), the UK, Ireland, Australia, South Africa and the USA were reviewed. Provincial and federal representatives were contacted to obtain copies of existing policies. International policies were found using an Internet search engine.

This policy was prepared by Charlene Wood, CPHIC, and completed on March 31 2006. It was reviewed and approved by the BC Enterics Policy Working Group consisting of representatives from the British Columbia Centre for Disease Control (BCCDC), the Regional Health Authorities, and the Licensing Leadership Council. It was approved by the BC CD Policy Committee on September 19 2006.

4.0 RATIONALE

The transmission of enteric infections occurs in high risk settings because of the opportunity for person-to-person transmission or transmission through food. The population in some of these settings may be at higher risk of serious illness or complications from these infections. The setting and the population may contribute to efficient transmission and the occurrence of outbreaks.

The risk of transmission from infected food handlers is documented in an international English language literature review (Guzewich and Ross, 1999). Authors identified 81 documented outbreaks involving 14,712 people, between 1975 and 1998. Hepatitis A (35%), Norovirus (26%), *Shigella sonnei* (6%), *Salmonella* Typhimurium (6%) and *Salmonella* Enteritidis (5%) were the most commonly identified pathogens. Published studies document person-to-person transmission of enteric infections in health care (Carter 1987, McCall 2000) and child care settings (Spika 1986, Belongia 1993, Gouveia 1998, O'Donnell 2002, Galanis 2003).

5.0 RISK ASSESSMENT

The exclusion of a case or contact from a high risk setting is based on a risk assessment of the individual and setting and depends on a number of factors:

- Properties of the infectious pathogen
- Nature of the duties of the case or contact
- Rigor of infection control measures in the high risk setting
- Risk factors of the case or contact and population at risk
- Symptoms of the case or contact
- Level of personal hygiene of the case or contact

The **Medical Health Officer** may decide to exercise his/her discretion outside the recommendations of these guidelines.

6.0 GENERAL PRINCIPLES

- **Based on severity of illness and evidence that continued presence or work in a high risk setting leads to transmission of infection, cases and, in some instances, contacts of cases with Shiga toxin-producing *E. coli*, hepatitis A, *Salmonella* Typhi/Paratyphi and *Shigella and V. cholerae O1 and O139* infections should be excluded from high risk settings and microbiological clearance should be obtained before they return.**

  Exclusion and microbiological clearance of confirmed cases and symptomatic or asymptomatic contacts of confirmed cases of enteric infections due to common causes other than those mentioned above (e.g. *Salmonella* non-Typhi/Paratyphi, *Campylobacter*, Norovirus, *Giardia*) can be managed as per probable cases (Table 1) or at the discretion of the Medical Health Officer.

  The existence of an outbreak in a high risk setting may require case or contact management beyond what is specified in these guidelines (BCCDC 2003).

- High risk workers should not work if experiencing diarrhea and/or vomiting, or fever (if *S.* Typhi is suspected), unless a non-infectious etiology has been diagnosed.

  - Because public health will not be aware of undiagnosed high risk workers, whenever it is possible, educate employers and workers regarding the risks

of working while ill. If public health is made aware of a high risk worker with an enteric infection, the case should be contacted and appropriate actions taken. A high risk worker with a chronic enteric disease should be counseled to seek medical attention if their symptoms change.

- Prior to return to work, high risk workers must be educated regarding personal hygiene appropriate to food handling, child or patient care.

  - Soap and water are the standard for hand washing. Most pathogens can be removed from hands by thoroughly washing hands with soap and water and ensuring that hands are dried completely using paper towels (Pether 1982, Coates 1987, Patrick 1997). The benefits of proper hand washing emphasize the need to assess a worker's hand hygiene and provide any necessary education to minimize the risk of disease transmission (see Appendix I: Personal Hygiene Assessment Checklist).

  - Alcohol hand sanitizers may be used when hands are not visibly soiled. However, food handlers should not use alcohol hand sanitizers as a substitute for hand washing. These products are not fully effective against bacterial spores, oocysts, and viruses such as norovirus and hepatitis A. Food handlers' hands are routinely soiled with fatty and proteinaceous materials that render the alcohol products ineffective (FDA 2003).

- Under the *Health Act Communicable Disease Regulation* BC Reg. 4/83, the Medical Health Officer can inform the employer or child care facility that their employee or attendee is infected with a communicable disease that can be spread to others and should be excluded from work or attendance until they have met the appropriate criteria.

7.0 DEFINITIONS

High risk setting: A setting where the nature of the high risk case or contact's activities increases the chance of transmission of enteric infections to others, including food premises, child care facilities, and residential and acute health care facilities or other clinical settings.

Child care facility: A community care facility or family day care setting or preschool where children under the age of 5 attend.

High risk worker: A person, paid or unpaid, working in a high risk setting where the MHO or designate determines that the risk of transmission of enteric disease to other workers or the public warrants exclusion.

- Food handler: A person, paid or unpaid, engaged in the preparation, manufacture, storage, serving or sale of food or drink where the food or drink itself is handled. This does not include a person who handles only completely packaged food or drink or a person who only handles food *before* it is cooked.[1]
- Child care worker: A person, paid or unpaid, working in a licensed or unlicensed child care or preschool (full or part time, or after school).

- Health care worker: A person, paid or unpaid, working in direct patient/resident care in an adult day program, residential or acute health care facility or other clinical setting.

Confirmed case: A person with a laboratory confirmed enteric infection with or without symptoms.

Probable case of gastroenteritis: A person with 2 or more episodes of diarrhea or vomiting of unknown etiology in a 24 hour period.

Contact: A person working in or attending a high risk setting, who is a household or sexual contact of a confirmed case, or has had a significant opportunity to acquire the infection, e.g. through consumption of a confirmed food source.

Modified exclusion: exclusion from work duties that may present a risk to public health.

8.0 EXCLUSIONS

8.1 Exclusions for Swimming Pool Workers and Patrons

Confirmed cases who work at swimming pools, hot tubs or spray parks, and spend time in the water, should be excluded from being in the water until 48 hours after their symptoms have resolved. Although compliance cannot be ascertained for the general public, the public should be given general advice about exclusion from such facilities until 48 hours after their symptoms have resolved.[2]

8.2 Exclusions for Swimming Cases of Hepatitis A and their Contacts

Refer to the Hepatitis A chapter in the Communicable Disease Control in BC manual and to the Biological Product Section in the BC Immunization Manual.

8.3 Exclusions for Probable Cases and Confirmed Non-HAV Viral Cases of Gastroenteritis, and Cases of Shiga toxin-producing *E. coli*, *Salmonella* Typhi/Paratyphi, *Shigella* and *V. cholerae* O1 and O139 and their Contacts

- **Table 1** applies to a probable case or their contact who is working in or attending a high risk setting and who is brought to the attention of the Medical Health Officer or designate.

- **Tables 2 to 5** apply to a confirmed case or their contact who is working in or attending a high risk setting and has a confirmed enteric infection caused by Shiga toxin-producing *E. coli, Salmonella* Typhi/Paratyphi*, Shigella or V. cholerae* O1 and O139.

Table 1: Probable Cases and Confirmed Non-HAV Viral Cases of Gastroenteritis and their Contacts

Assess and *counsel probable and diagnosed cases regarding required personal hygiene (Appendix I). The lifting of the exclusion for Table 1 cases is based on the cessation of symptoms and not on the demonstration of the absence of pathogens in clinical samples.*

HIGH RISK WORKERS and CHILD CARE ATTENDEES

Probable or Diagnosed Case

- Advise case to seek medical attention if appropriate for testing and diagnosis.
    - If test is positive for a specific pathogen, refer to the appropriate table and proceed with necessary steps.
- Exclude a case with diarrhea or vomiting of unknown etiology or non-HAV viral etiology until at least 48 hours after the last loose stool or vomiting episode, whichever comes last.[3]
    - If anti-diarrheal medications have been taken, exclude the case until diarrhea-free for at least 48 hours after the cessation of medications.

Symptomatic Contact

- Exclude as per probable case

Asymptomatic Contact

- No exclusion required
- Advise that if gastrointestinal symptoms develop, to seek medical attention and exclude as per probable case

Exclusion of Enteric Cases and their Contacts from High Risk Settings
TABLE 2: Shiga toxin-producing *Escherichia coli* (STEC)

Assess and counsel confirmed cases and contacts regarding required personal hygiene (Appendix I).

HIGH RISK WORKERS

Confirmed Case (Culture-confirmed case (*E. coli* O157 and non-O157 STEC) or culture negative Shiga toxin positive case)

- Exclude until provision of 2 consecutive negative stool cultures[4], taken after symptom resolution, collected not less than 24 hours[5] apart and at least 48 hours after the completion of a prescribed course of antibiotics and/or anti-diarrheal medications, if used.[6]

Symptomatic Contact

- Exclude as per confirmed case

Asymptomatic Contact[7]

- No exclusion required

CHILD CARE ATTENDEES

Confirmed Case

- Exclude until provision of 2 consecutive negative stool cultures[4], taken after symptom resolution, collected not less than 24 hours[5] apart and at least 48 hours after the completion of a prescribed course of antibiotics and/or anti-diarrheal medications, if these medications have been used.[6]

Symptomatic Contact

- Exclude as per confirmed case

Asymptomatic Contact (household contact of case attending a child care facility)

- Exclusion until provision of 1 negative stool culture[8]

TABLE 2 Shiga toxin producing *Escherichia coli* (STEC) Continued

Outbreak considerations

If there is >1 confirmed case or 1 confirmed case and any number of symptomatic contacts in the child care facility, initiate an outbreak investigation and consider closing the facility.

The rate of infection is higher and illness may be more severe in children under 5 years of age. Outbreaks of STEC occur in child care facilities (Spika 1986, Belongia 1993, Boyce 1995, Gouveia 1998, Fitzpatrick 1999, Wong 2000, O'Donnell 2002, Galanis 2003, BCCDC 2004). If there is a confirmed case in the child care facility, operators should be advised to:

- Consult with public health.
- Monitor all children for symptoms and inform all parents, by phone or letter, of a confirmed case in the facility.
- Immediately exclude any child with diarrhea from the facility and inform public health. Until the child is picked up by a parent/guardian, move the child to a separate area away from contact with other children. If possible, the child should be cared for by staff that have no or minimal contact with other children. Advise parents that public health will follow-up with them, considering the child to be a symptomatic contact.
- Advise all staff, especially those involved in food handling, diapering or toileting children to be vigilant regarding their own hand washing and supervision of children's hand washing.

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TABLE 3: Typhoid Fever (*Salmonella* Typhi) and Paratyphoid Fever (*Salmonella* Paratyphi excluding S. Paratyphi B Java)

Assess and counsel confirmed cases, contacts and excreters regarding required personal hygiene (Appendix I).

HIGH RISK WORKERS and CHILD CARE ATTENDEES

Confirmed Case

- **Exclude until provision of**
  - **3 consecutive negative stool samples** collected at least 1 week apart and at least 2 weeks after completion of antibiotic treatment.[9]
    - If case was treated while traveling and the appropriate medication may not have been prescribed, the case should be referred to a physician for assessment. Sampling should only commence after the appropriate treatment is completed.

  AND
  - **1 negative urine sample** from a confirmed case who has ever traveled to a schistosomiasis-endemic country and may have been exposed to schistosomiasis.[10]
    - If urine sample is positive for *S*. Typhi or *S*. Paratyphi, advise physician to test case for schistosomiasis.
    - If case is positive for *S*. Typhi or *S*. Paratyphi and schistosomiasis, advise physician to treat case concurrently for both infections, even if this means repeating antibiotic treatment.[11]

- **Collection of stool samples**

  1. Submit 3 stool samples at least 1 week apart. If all 3 samples are negative, end exclusion.
  2. If any of the 3 samples are positive, continue sampling at least 1 week apart for a maximum of 3 more samples. If 3 consecutive samples are negative, end exclusion.
  3. If 3 consecutive negative stool samples (after 6 samples collected) cannot be achieved, the confirmed case is classified as an excreter (see below).

If the case's infection is not associated with travel or contact with a confirmed case, discuss with the MHO and notify BCCDC.

Excreter

- A confirmed case who continues to excrete *S.* Typhi after 6 stool samples are collected, at least 1 week apart, and at least 2 weeks after completion of antibiotic treatment to which the pathogen is known to be sensitive.[12]
- Discuss exclusion and further action with the MHO.[13]

TABLE 3 Typhoid Fever and Paratyphoid Fever Continued

Symptomatic Contact

- **Exclude until provision of**
  - **2 consecutive negative stool samples**[14] collected at least 1 week apart, and taken after the confirmed case has finished treatment, AND
  - **1 negative urine sample** from a contact who has ever traveled to a schistosomiasis-endemic country and may have been exposed to schistosomiasis. [10]
  - If any sample is positive, exclude as per confirmed case.

Asymptomatic Contact[15]

- Exclusion of an asymptomatic contact who traveled with a case until 2 negative stool samples taken at least 48h apart after the case has commenced treatment.[16]
- No exclusion required for asymptomatic contacts who did not travel with a case. (If the source of illness in the case is unclear, consider testing contacts to identify the source.)[7, 17]

Outbreak considerations

If there is >1 confirmed case or 1 confirmed case and any number of symptomatic contacts in the child care facility, initiate an outbreak investigation and consider closing the facility.

Cases <u>not</u> working in or attending high risk settings

S. Typhi, and to some extent, *S*. Paratyphi infections can lead to a carrier state. While no exclusion is necessary, public health should educate *S*. Typhi and *S*. Paratyphi cases and their physician about the availability of testing to ensure clearance of the organism.

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TABLE 4: *Shigella* Species

Assess and counsel confirmed cases and contacts regarding required personal hygiene (Appendix I).

Shigella species

Confirmed Case

- **Exclude all confirmed cases of _Shigella_ infection from working or attending high risk settings until the species is known.**
- Once the species is confirmed, complete follow-up according to species.

Shigella sonnei

HIGH RISK WORKERS

Confirmed Case

- Exclude until 48 hours after the last loose stool or vomiting episode, whichever comes last. No evidence of microbiological clearance is necessary.[18]

Symptomatic contact

- Exclude as per confirmed case

Asymptomatic contact[7]

- No exclusion required

CHILD CARE ATTENDEES

Confirmed Case[19]

- Exclude until provision of 2 consecutive negative stool samples[4], collected not less than 24 hours apart and at least 48 hours after the completion of antibiotics.
- Advise all staff; especially those involved in food handling, diapering or toileting children to be vigilant regarding their hand washing and supervision of children's hand washing.

Symptomatic Contact

- Exclude until provision of one negative stool sample.
- If positive, exclude as per confirmed case. If negative, exclude from the child care facility until 48 hours after the last loose stool or vomiting episode, whichever comes last.

TABLE 4: *Shigella* Species Continued

Asymptomatic Contact (household contact of case attending a child care facility)

- Exclude until provision of 1 negative stool sample.[20]

Shigella dysenteriae, flexneri, boydii

WORKERS IN HIGH RISK SETTINGS AND CHILD CARE ATTENDEES

Confirmed Case and Symptomatic Contact

- Exclude until provision of 2 consecutive negative stool samples[4], collected not less than 24 hours apart and at least 48 hours after the completion of antibiotics.[21]

Asymptomatic Contact[7]

- No exclusion required

CHILD CARE ATTENDEES

Confirmed Case and Symptomatic Contact

- Exclude until provision of 2 consecutive negative stool samples[4], collected not less than 24 hours apart and at least 48 hours after the completion of antibiotics.[21]

Asymptomatic Contact (household contact of case attending a child care facility)

- Exclude until provision of 1 negative stool sample.[22]

Table 5. ***V. cholerae*** **O1 and O139 (Excluding** ***V. cholerae*** **non-O1 non-O139)**

Assess and c*ounsel probable cases and contacts regarding required personal hygiene (Appendix I).*

HIGH RISK WORKERS and CHILD CARE ATTENDEES

Confirmed Case

- Exclude until 48 hours after the last loose stool.[23]

  Microbiological clearance required only if sanitary facilities or personal hygiene are inadequate. Then, exclude until provision of 2 consecutive negative stool samples, taken after symptom resolution, collected not less than 24 hours[5] apart.

Symptomatic Contact

- Exclude as per confirmed case.

Asymptomatic Contact[7, 24]

- No exclusion required

9.0 EXPLANATORY NOTES

[1] Modified definition based on the *Health Act Communicable Disease Regulation,* BC Reg. 4/83 definition of "food handler". [cited 2006 Mar 18]. Available from: http://www.qp.gov.bc.ca/statreg/reg/H/Health/4_83.htm

[2] Consensus of the Working Group: The BC Swimming Pool Regulation, currently in draft form, will address the issue of patrons not being allowed to use the pool in certain situations, including illness.

[3] Consensus of the Working Group: A 48h interval was determined to ensure the case's symptoms have resolved. Most pathogens can be passed in the stools after symptoms have resolved, but if an individual is asymptomatic, good hygiene practices reduce the risk of transmission.

[4] Stool samples for cases undergoing microbiological clearance testing should be culture negative.

Both *E. coli* O157 and non-O157 infected individuals may shed for prolonged and intermittent periods (Karch 1995, Miliwebsky 2007) and both symptomatic and asymptomatic individuals can transmit the infection (Galanis 2003, Gilbert 2008). **As only the BCCDC Laboratory has the capacity to detect non-O157 STEC, all stool samples tested in the assessment of microbiological clearance for non-O157 STEC cases must be submitted to the BCCDC Laboratory.**

In BC, all *E. coli* O157 isolates and all culture negative bloody stool samples are sent to the BCCDC lab for Shiga toxin assay testing. If Shiga toxin is present, further identification tests are conducted to confirm the presence of *E. coli* O157 and/or to determine which serotype is present (e.g. *E. coli* O26). BC local labs (private and hospital) do not currently have the capacity to fully detect STEC serotypes other than O157.

Based on a review of the literature, environmental scan of provincial and international policies and discussion with experts, it was decided by consensus that Shiga toxin results would not be used in the assessment of microbiological clearance (i.e. a case who has had 2 negative consecutive stool cultures but remains Shiga toxin positive may return to the high risk setting if the risk of transmission is considered minimal based on a hygiene assessment). Although Shiga toxin may be present in stool for longer periods or more consistently than the pathogen, its public health significance is unclear (Kuusi 2007). Although theoretically possible, there is no evidence of transmission of STEC from an asymptomatic culture negative toxin positive case. Continued exclusion based solely on Shiga toxin results could cause undue hardship on the case and family.

Cases who are initially culture negative but Shiga toxin positive are likely false negative cultures that may be positive in future samples. Such cases should follow the same exclusion guideline as culture positive cases (i.e. require 2 negative consecutive stool cultures conducted at the BCCDC).

[5] Consensus of the Working Group: A 24 hour waiting period between samples is based on best practices identified in many jurisdictions. No evidence was found to further support this 24 hour time period.

[6] Antibiotics and anti-diarrheal medications are not currently recommended in the treatment of STEC because of their potential association with an increased risk of HUS (Wong *et al* 2000, Safdar *et al* 2002, Tarr *et al* 2005).

[7] As a general rule, asymptomatic contacts do not need to be tested nor excluded. They have a low risk of infection and a low risk of transmission. Testing and excluding someone from their work place or from attending child care also has important adverse societal and medical costs. Contacts should be educated on the nature of the disease and the steps to reduce their risk of infection and transmission to others in the event they become infected; they should be advised to exclude themselves from work or child care if they become symptomatic and to report to public health immediately.

[8] Consensus of the Working Group: Exclusion until microbiological clearance using one stool sample is suggested based on best practices in at least one other jurisdiction (PHLS 2004) and the anecdotal evidence of spread from an asymptomatic child to other children in a child care facility. The WG does not require two stool samples because there is no strong evidence to support this and does not want to apply undue pressure on families.

The UK (PHLS 2004) recommends exclusion of contacts until two negative stools taken 48 hours apart and does not differentiate between symptomatic and asymptomatic contacts. Most other jurisdictions don't recommend exclusion of asymptomatic contacts. No supporting evidence is available either way. Intermittent shedding of STEC is uncommon (Belongia 1993). Asymptomatic infection in children is uncommon (Belongia 1993, Galanis 2003).

[9] Consensus of the Working Group: The requirements in this section are in line with best practices in other countries. The requirements for the number of samples collected, the time between collection of samples, and the two week period before sample collection begins are based on the prolonged and intermittent shedding of *S*. Typhi. Collecting fewer samples or collecting them too closely together could result in false negatives samples and the assumption that a case is clear of the infection.

Since *S.* Typhi infections do not clear without treatment, collection of samples should start after the completion of treatment. Antibiotic treatment decreases morbidity, mortality and prolonged shedding (Heymann 2004).

The two week waiting period takes into account the potential for patients to suffer a relapse after treatment. No further evidence was found to support waiting for a specified period of time from the onset of symptoms to begin sample collection.

S. Typhi bacteria can adhere to the surface of *Schistosoma* during bacteremia if both pathogens are present concomitantly. This symbiotic relationship can occur with all species of *Schistosoma*. It leads to the intermittent, often asymptomatic release of *S*. Typhi in the urine and can confer antimicrobial resistance to *S*. Typhi (Gendrel 1993).

[10] Schistosomiasis endemic areas include Africa, China, India and some countries in South America, the Caribbean, the Middle East and South East Asia. [cited 2006 Mar 18]. Available from: http://www.cdc.gov/ncidod/dpd/parasites/schistosomiasis/factsht_schistosomiasis.htm. For a current list of endemic countries see the CDC website.

A person can be exposed to *Schistosoma* larvae when swimming or wading in fresh water, in a country where schistosomiasis is endemic.

[11] Treatment solely for schistosomiasis in people with concurrent infection with *S.* Typhi or *S.* Paratyphi will cause the release of *Salmonella* bacteria from *Schistosoma* and shedding in the urine (Bourée 2002, Penaud 1983).

S. Typhi can also rarely cause symptomatic urinary tract infections, independent of *Schistosoma* infections (Mathai 1995).

[12] Consensus of the Working Group: There is no scientific evidence stating the number of samples or the length of time that is required before classifying a case as an excreter.

[13] Further exclusion and testing should be determined by the Medical Health Officer based on an individual risk assessment.

[14] Based on best practices (Heymann 2004, Public Health Agency of Canada 2003, Working Group of the former PHLS Advisory Committee on Gastrointestinal Infections 2004). Two samples (rather than one) are required because *S.* Typhi is shed intermittently. The attack rate in household contacts is relatively low; in one study, only 2% of 1000 contacts were positive for *S.* Typhi (Braddick 1991).

[15] *S.* Typhi/Paratyphi infection symptoms include fever, headache, malaise, anorexia, constipation and/or diarrhea.

The long incubation period for *S.* Typhi means that an asymptomatic person may test negative but may become ill at a later date.

[16] Consensus of the Working Group: The requirement in this section is in line with best practices in other countries. The UK (PHLS 2004) recommends exclusion of contacts who may have had similar exposure to case with 2 negative stool 48h apart after the case has commenced treatment. A contact who traveled with a case to an endemic country is likely to have been exposed to similar sources and is at a higher risk of infection. Testing of asymptomatic contacts is recommended because although asymptomatic infection is uncommon, carriage occurs in about 5% of infection individuals. Two samples are recommended because intermittent shedding is common (5-20% in Buchwald 1984).

[17] Only 2.6% of contacts have been found to be infected (Braddick 1991).

[18] There is agreement by many other jurisdictions that microbiological clearance for *Shigella sonnei* is not required (Working Group of the former PHLS Advisory Committee on Gastrointestinal Infections 2004, Food Handlers with Potentially Foodborne Diseases Subcommittee 2004). It is difficult to define "clearance" because the excretion of *Shigella* after recovery may be intermittent and prolonged. Median durations of excretion of 17 to 29 days

have been reported. Where exclusion was practiced, the use of three rather than two consecutive negative fecal samples or one negative sample to determine clearance of *S. sonnei* did not confer additional benefit (Newman 1993).

There is a 10% chance of a positive sample after three negative samples, therefore two or three negative stools do not equate to clearance, or negate the possibility that individuals will continue to intermittently excrete small numbers of bacteria. "The weight of evidence suggests that although the infectious dose is small, asymptomatic *Shigella* carriers practicing good personal hygiene pose minimal risk of spread of the infection" (Food Handlers with Potentially Foodborne Diseases Subcommittee 2004).

[19] *S. sonnei* is the most common *Shigella* species in Canada, is most common in infants and preschool children and has become an important issue in daycares, although illnesses are generally mild. Infected children 5 years or younger have an increased risk of transmission in child care facilities because of close contact with other children (especially those who are diapered), poor hand washing, and mouthing of toys. Exclusion and microbiological clearance are recommended by others (Aronson 2005, Pickering 2003, Public Health Agency of Canada 2003).

[20] Consensus of the Working Group: Based on evidence of asymptomatic carriage (Heymann 2004).

[21] *S. dysenteriae, flexneri, boydii* infection cases require microbiological clearance prior to return to a high risk setting because they can lead to severe infections and complications (Pickering 2003).

[22] Consensus of the Working Group: Exclusion until microbiological clearance using one stool sample is suggested based on best practices in at least one other jurisdiction (PHLS 2004) and evidence of asymptomatic carriage (Heymann 2004). The WG does not require two stool samples because there is no strong evidence to support this and does not want to apply undue pressure on families.

[23] Most jurisdictions including WHO, UK, Ireland and Western Australia all exclude until 48h after symptoms; microbiological clearance with 2 negative stools is required only if hygiene is inadequate. Secondary spread is rare where hygiene and sanitary facilities are adequate. Usually, stools remain positive for only a few days after recovery. Transmission via food from infected foodhandlers has been documented internationally but no secondary cases have been reported in Canada. Person-to-person spread is rare; a large inoculum is necessary (PHLS 2004).

[24] Asymptomatic carriage of *V. cholerae* is possible but rare.

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11.0 APPENDICES

11.1 Appendix I: Personal Hygiene Assessment Checklist for High Risk Workers

This checklist is useful for assessing all high risk workers, however some questions may not apply to all high risk workers.

PERSONAL HYGIENE ASSESSMENT CHECKLIST FOR HIGH RISK WORKERS

Date of assessment:

Premises name: **Type of high risk setting:**

Inspector: **Consulted MHO:** **Consulted LO:**

Name of worker: **Name of disease:**

OWNER RESPONSIBILITY

Discuss with the owner, operator and/or supervisor their responsibilities re: exclusion of workers with diarrhea and/or vomiting and ensuring workers follow required personal hygiene procedures.

1. ASSESSMENT OF WORKPLACE COMPLIANCE

A. Are past inspection reports FREE of the following infractions?

Dates of inspection reports under review: ______________________

	Yes	No	DK
• Lack of access to the hand washing sinks	___	___	___
• Failure to supply running water, liquid soap or paper towels	___	___	___
• Workers not washing hands when necessary	___	___	___
• Workers not washing hands properly	___	___	___
• Owner failing to exclude ill workers	___	___	___

Comments: ____

____

B. Review hand washing stations. Are the following available?

	Yes	No	DK
• Dedicated hand washing stations in work areas	___	___	___
• Adequate number of hand washing stations	___	___	___
• Evidence that hand washing stations are being used	___	___	___
• Accessible location of stations	___	___	___
• Hand washing sink is free of clutter	___	___	___
• Adequate maintenance of washrooms	___	___	___
• Hot and cold running water	___	___	___
• Liquid soap and paper towels	___	___	___

Comments: ____

2. ASSESSMENT OF WORKER COMPLIANCE

A. What are the worker's duties? ____

____

What is the health status of the worker? ____________________________________

____

Is there a language barrier? ____

B. Observe the worker's practices in the workplace. Is the worker:

	Yes	No	DK
• Washing hands properly: 1. Lathering with liquid soap 2. Washing hands for at least 20 seconds 3. Rinsing hands well 4. Drying hands thoroughly with paper towel 5. Turning off the tap with paper towel	___	___	___
• Washing hands when returning to the kitchen or duties	___	___	___
• Washing hands after coughing, sneezing, touching hair, face or nose, eating, drinking or smoking, or otherwise contaminating hands	___	___	___
• Washing hands prior to preparing ready-to-eat foods	___	___	___
• Refraining from wearing a dirty uniform/apron or wiping hands on it	___	___	___
• Refraining from wearing jewelry or fake/long nails	___	___	___

Comments: ____

____

11.2 *Appendix II: Letters to Cases, Contacts & Employers*

Letters*[§]

To employer re: an employee who is a confirmed case
To employer re: an employee who is a contact
To a confirmed case – STEC (modify for other diseases)
To a confirmed case – *S.* Typhi
To a contact – *S*. Typhi (modify for other diseases)
Return to work

*These letters are based on Fraser Health letters that were modified as per legal advice from the Ministry of Health. They can be further modified at the discretion of the Health Authorities, but the basic elements should remain intact. The letters to employers should *not* include the name of the enteric infection. The legislation that gives the MHO authority to exclude should always be cited.

[§] A letter is not provided for every enteric infection. In the letters, exclusion requirements for cases and contacts should be modified depending on the enteric infection, according to the tables in the guideline.

Date

Name
Address

Method of delivery:
Date & time of delivery:

Phone #

Dear '**Employer Name**':

RE: EXCLUSION OF EMPLOYEE – (Name)

As required by the *Health Act Communicable Disease Regulation* BC Reg. 4/83, and in order to protect the public's health, your employee (Name), has been excluded from work involving (list of duties to be specified by the Health Authority), because (Name):

- Has a communicable disease that can be spread to others through preparation of food and drink and contact with other people.

(Name) has been given both verbal and written information about the criteria that must be met before returning to work. When the necessary criteria are met, the Public Health Inspector will provide you and (Name) with a letter allowing (Name) to safely return to work. If (Name) is well enough to work, it may be possible for him/her to carry out duties that would not be a risk to public health. You must have Medical Health Officer approval for this. See contact details below.

Please note that under the above noted regulation, (Name) can only be cleared to return to work by a Medical Health Officer. A letter from your employee's physician directly to you or your employee **cannot** clear your employee to return to work.

If you have any questions, please contact your Public Health Inspector (name and number).

Sincerely,

Medical Health Officer

Date

Name
Address

Method of delivery:
Date & time of delivery:

Phone #

Dear '**Employer Name**':

RE: EXCLUSION OF EMPLOYEE - (name)

As required by the *Health Act Communicable Disease Regulation* BC Reg. 4/83, and in order to protect the public's health, your employee (Name), has been excluded from work involving (list of duties to be specified by the Health Authority), because (Name) is undergoing investigation to determine if (he/she) has a communicable disease that can be spread to others through preparation of food and drink and contact with other people.

(Name) has been given both verbal and written information about the criteria that must be met before returning to work. When the necessary criteria are met, the Public Health Inspector will provide you and (Name) with a letter allowing (Name) to safely return to work. If (Name) is well enough to work, it may be possible for him/her to carry out duties that would not be a risk to public health. You must have Medical Health Officer approval for this. See contact details below.

Please note that under the above noted regulation, (Name) can only be cleared to return to work by a Medical Health Officer. A letter from your employee's physician directly to you or your employee **cannot** clear your employee to return to work.

If you have any questions please contact your Public Health Inspector, 'Name' at 'Phone Number'.

Sincerely,

Medical Health Officer

Date

Name
Address

Method of delivery:
Date & time of delivery:

Phone #

Dear '**Case Name**':

RE: EXCLUSION FROM WORK – SHIGA TOXIN-PRODUCING *E. COLI*

As required by the *Health Act Communicable Disease Regulation* BC Reg. 4/83, it has been reported to (Health Authority Name) that you have a Shiga toxin-producing *E. coli* infection. This type of *E. coli* can be spread to others through preparation of food and drink and contact with other people. Therefore, you must be excluded from work as it involves one or more of these potential methods of spread. This exclusion from work will continue until you provide evidence to your Public Health Inspector that you have cleared the infection, specifically:

- 2 consecutive negative stool samples, taken after symptoms have stopped, collected not less than 24 hours apart and at least 48 hours after the completion of a prescribed course of antibiotics and/or anti-diarrheal medications, if these medications have been used.

Your Public Health Inspector will give you information about (HA specific information re: sample kit collection and delivery, and laboratory results). If you are well enough to work, it may be possible for you to carry out duties that would not be a risk to public health. You must have Public Health approval for this. See contact details below.

It is your responsibility to follow-up with your Public Health Inspector who can provide a letter, from the Medical Health Officer to you and your employer that allows you to return to work.

Please note that under the Health Act you can only be cleared to return to work by a Medical Health Officer. A letter from your physician directly to your employer **cannot** clear you to return to work.

If you have any questions please contact your Public Health Inspector, 'Name' at 'Phone Number'.

Sincerely,
Medical Health Officer

Date

Name
Address

Method of delivery:
Date & time of delivery:

Phone #

Dear '**Case Name**':

RE: EXCLUSION FROM WORK – TYPHOID/PARATYPHOID CASE

As required by the Health Act Communicable Disease Regulation BC Reg. 4/83, it has been reported to (Health Authority Name) that you have a typhoid/paratyphoid infection. Typhoid/Paratyphoid is easily spread to others through preparation of food and drink and contact with other people. Therefore, you must be excluded from work as it involves one or more of these potential methods of spread. This exclusion from work will continue until you provide evidence to your Public Health Inspector that you have cleared the infection, specifically:

- 3 consecutive negative stool samples collected at least 1 week apart and at least 2 weeks after completion of antibiotic treatment. If you were treated while traveling and it is possible that the appropriate medication was not prescribed, you will be referred to your physician for assessment of re-treatment. Sampling can only commence after re-treatment is completed.

- 1 negative urine sample if you traveled to a country where you may have been exposed to schistosomiasis (a parasitic infection)

Your Public Health Inspector will give you information about (HA specific information re: sample kit collection and delivery, and laboratory results). If you are well enough to work, it may be possible for you to carry out duties that would not be a risk to public health. You must have Public Health approval for this. See contact details below.

It is your responsibility to follow-up with your Public Health Inspector who can provide a letter, from the Medical Health Officer to you and your employer that allows you to return to work.

Please note that under the Health Act you can only be cleared to return to work by a Medical Health Officer after the required lab results are received. A letter from your physician directly to your employer **cannot** clear you to return to work.

If you have any questions please contact your Public Health Inspector, 'Name' at 'Phone Number'.

Sincerely,

Medical Health Officer

Date

Name
Address

Phone #

Method of delivery:
Date & time of delivery:

Dear ‘**Contact Name**’:

RE: EXCLUSION FROM WORK – TYPHOID/PARATYPHOID CONTACT

You have been identified to (Health Authority Name) as a contact of an individual with a typhoid/paratyphoid infection. Being a contact puts you at risk for getting typhoid/paratyphoid yourself. Typhoid/Paratyphoid is easily spread to others through preparation of food and drink and contact with other people. Therefore, you must be excluded from work as it involves one or more of these potential methods of spread. This exclusion from work will continue until you provide evidence to your Public Health Inspector that you do not have the infection, specifically:

- (Refer to Table 4 and insert requirements depending on whether contact is symptomatic or asymptomatic.)

Your Public Health Inspector will give you information about (HA specific information re: sample kit collection and delivery, and laboratory results). If you are well enough to work, it may be possible for you to carry out duties that would not be a risk to public health. You must have Public Health approval for this. See contact details below.

It is your responsibility to follow-up with your Public Health Inspector who can provide a letter, from the Medical Health Officer to you and your employer, that allows you to return to work.

Please note that under the Health Act you can only be cleared to return to work by a Medical Health Officer after the required lab results are received. A letter from your physician directly to your employer **cannot** clear you to return to work.

If you have any questions please contact your Public Health Inspector, ‘Name’ at ‘Phone Number’.

Sincerely,

Medical Health Officer

Date

Name
Address

Phone #

Method of delivery:
Date & time of delivery:

Dear ‘**Case or Contact Name**’:

RE: RETURN TO WORK

The Health Authority has received the required test results indicating that you no longer (‘have a communicable disease’ OR ‘are a contact of a person with a communicable disease’) that is easily spread to others through preparation of food and drink and contact with other people.

As a result, you are permitted to return to work. You may provide a copy of this letter to your employer as verification that it is safe for you to perform your regular duties.

If you have any questions please contact your Public Health Inspector, ‘Name’ at ‘Phone Number’.

Sincerely,

Medical Health Officer