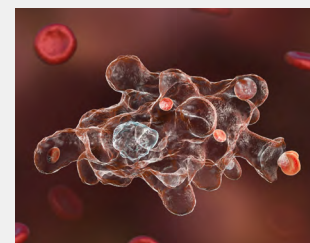


This clinical decision support tool is intended primarily for front-line clinicians. It is provided for information purposes only and should not replace the judgment of the clinician who performs activities reserved under a statute or a regulation. This tool is based on clinical recommendations developed by INESSS using a systematic process and is supported by the scientific literature and the knowledge and experience of Québec clinicians and experts. This tool does not cover public health situations, testing for *Clostridioides difficile*, or diarrhea caused by sexually transmitted and blood-borne infections (STBBI). For further details, go to [inesss.qc.ca](https://inesss.qc.ca).

## INDICATIONS

- ➔ **Microbiological stool testing** is generally relevant for:
  - confirming a bacterial or parasitic etiology requiring management
  - ruling out an infectious etiology
  - monitoring community or food-related outbreak situations (not covered in this clinical tool)
- ➔ **Stool testing is generally not required** if the clinical presentation suggests a viral enteric infection, except:
  - in the context of an outbreak or
  - if the person has an immunodeficiency in specific clinical contexts (if applicable, refer to recommendations by the Laboratoire de santé publique du Québec)
- ➔ **Basic bacterial stool testing** generally includes testing for:
  - *Campylobacter*
  - *E. coli* STEC O157, with the nucleic acid amplification test (NAAT) for Shiga toxins added automatically in the presence of bloody stools or in a child under the age of 5 years
  - *Salmonella* sp.
  - *Shigella*
  - *Yersinia*
- ➔ If suspected, *C. difficile* should be tested for in:
  - adults and
  - children over 12 months of age.



Consult INESSS's optimal use guide on the treatment of *C. difficile*-associated diarrhea or colitis or another reference document to guide your investigation.

- ➔ **Increased vigilance** in adults or accelerated management in children can be considered if there is a history of transplant, immunodeficiency or a comorbidity, or during pregnancy.
- ➔ A person with an immunodeficiency (e.g., immunotherapy, corticosteroids, HIV) **might require further investigation** after discussion with a gastroenterologist or a microbiology/infectious disease physician, or with an experienced colleague. This investigation will indicate whether less common pathogens are causing the diarrhea.
- ➔ **Parasite investigation requires specific information to be provided on the requisition form** to permit targeted stool analysis (see the section entitled "Information to be provided to the laboratory" for further details).
- ➔ **Follow-up stool testing should not be ordered if the diarrhea has resolved**, unless it is required for return-to-work purposes.



Item concerning children

*C. difficile*: *Clostridioides* (formerly *Clostridium*) *difficile*

STEC: Shiga toxin-producing *E. coli*

NAAT: nucleic acid amplification test

## DECISION-MAKING PROCESS

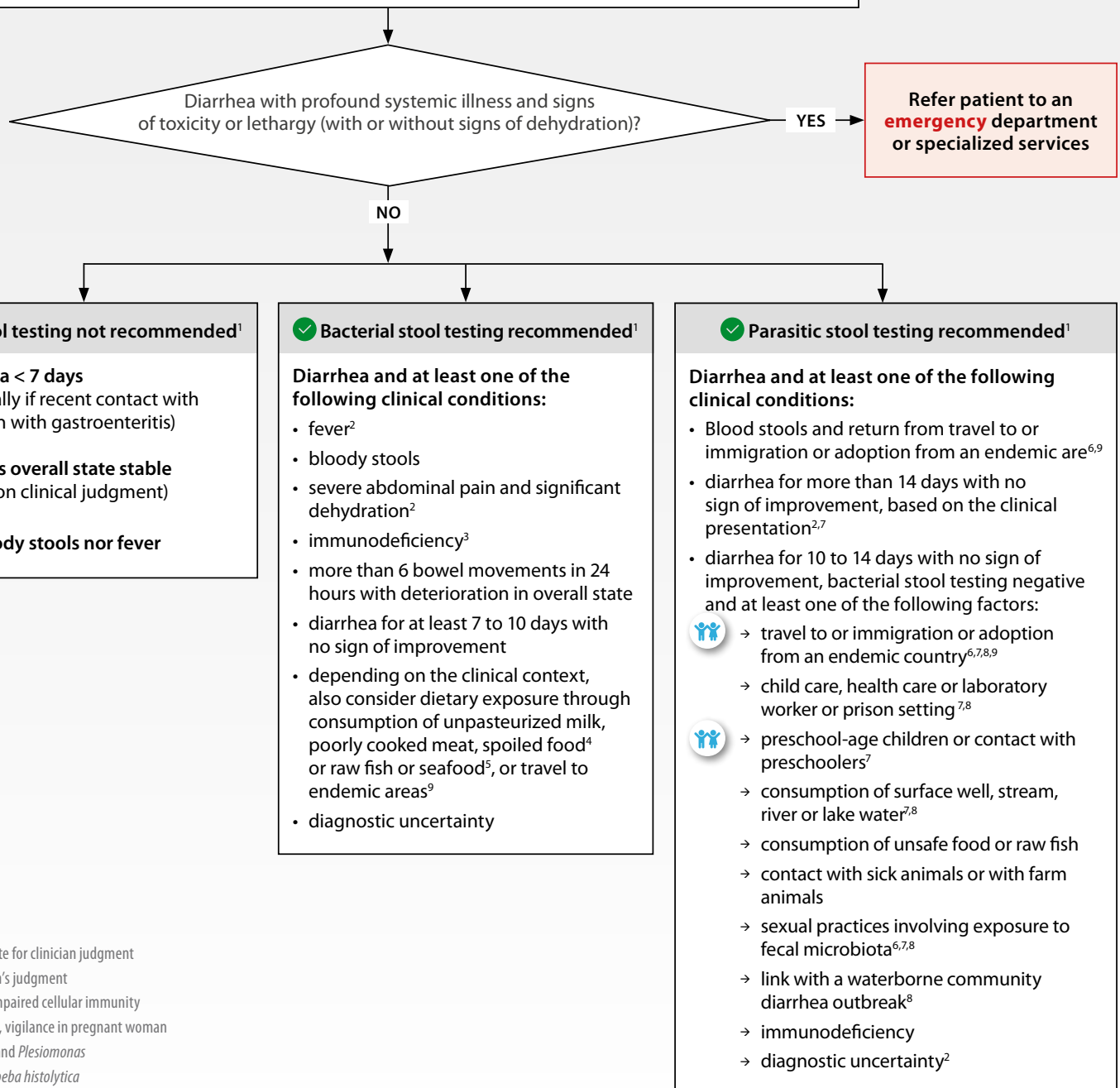
### EVALUATION OF THE CLINICAL PRESENTATION

- Frequency of soft or liquid stools (high or unusual), with or without nausea and vomiting, accompanied by deterioration in the person's overall state and an inability to carry out activities of daily living
- Duration of the diarrhea and severity of the clinical situation, and [possible etiological clues](#) (Appendix A)
- **!** Special situations (e.g., immunodeficiency, comorbidities, recent enterocolitis, pregnancy) or [risk factors](#) (Appendix B)
  - Confirm that the diarrhea is not being caused by:
    - medications (antibiotics or other products with a laxative effect)
    - natural health products
    - food intolerances or allergies, a diet high in insoluble fibre, or alcohol consumption
    - ischemic colitis (especially in the elderly)
- Consider [non infectious causes](#) if bacterial stool testing is negative (Appendix C)

### REMINDER

Fecal impactions or incontinence can cause false diarrhea, especially in the elderly.

Rectal fissures (especially in young children) and hemorrhoids can cause blood in the stool.



1. Not a substitute for clinician judgment

2. In the clinician's judgment

3. Especially if impaired cellular immunity

4. Risk of *Listeria*, vigilance in pregnant woman

5. Risk of *Vibrio* and *Plesiomonas*

6. Risk of *Entamoeba histolytica*

7. Risk of *Giardia*

8. Risk of *Cryptosporidium*

9. Risk of pathogens specific to the country (consult INSPQ's *Guide d'intervention en santé voyage*).

## CLINICAL INFORMATION TO BE PROVIDED TO THE LABORATORY


- Bloody stools or mucus in stool
- Recent travel to or immigration/adoption from an endemic country
- Contact with sick or farm animals
- Immunodeficiency

## ADDITIONAL INFORMATION

### SPECIMEN

- It is good practice to follow the laboratory's specimen collection and transport recommendations.

### NUMBER OF SPECIMENS

<b>Bacterial stool testing</b>		A single specimen per 7-day period 	A second sample could be tested if the cause of the enteric infection remains unknown and the symptoms persist.
<b>Parastic stool testing</b>	<b>using molecular methods</b>	A single specimen	A second sample could be tested if the cause of the enteric infection remains unknown and the symptoms persist.
	<b>by microscopy</b>	Two to three specimens collected 2 or 3 days apart in a 10-day period	A second sample is usually necessary when a positive result is obtained for <i>Entamoeba histolytica/dispar</i> by microscopy in order to determine the species with a nucleic acid amplification test (NAAT).
<b>Viral stool testing</b> <sup>1</sup> (if clinically appropriate <sup>2</sup> or in the setting of a community outbreak)		A single specimen	

 New information in some settings

1. This requires prior agreement with the receiving laboratory.

2. Persons with an immunodeficiency or chronic inflammatory bowel disease, and premature infants with neonatal necrotizing enterocolitis.

### REQUISITION FORM

- The clinician might have to choose the parasite detection method if the requisition form is from a laboratory that offers both NAAT and microscopy:
  - NAAT is a fast and sensitive test. Test 45098 in the *Répertoire* detects *Cryptosporidium* sp., *Dientamoeba fragilis*, *Entamoeba histolytica* and *Giardia lamblia*;
  - Microscopy is the conventional method for parasite testing. It is necessary in some circumstances, which can include, among others, unexplained eosinophilia, the consumption of raw fish, or other reasons determined by the laboratory.

### OTHER INFORMATION

- The parasites detected by microbiological stool testing are not necessarily pathogens.
- Consult the table in Appendix B on the [risk of exposure](#) (Annexe B) to the most commonly encountered enteropathogens in order to inform the person of the possible source of the infection.

## REMINDER TO THE USER

- In the presence of a negative bacterial stool testing result and risk factors (listed under “DECISION-MAKING PROCESS”), invite the person to consult again if the diarrhea persists beyond 10 days, in order to assess the clinical relevance of other tests.

## SPECIALIST CONSULTATION

- Persistence of diarrhea with **negative bacterial and parasitic stool test results**
- Children and, if necessary, adults with:
  - comorbidities (e.g., chronic inflammatory bowel disease, renal failure, cancer, sickle cell anemia, hemochromatosis)
  - immunodeficiency
  - history of transplant



Item concerning children

## REFERENCES

- To consult any of the references, see INESSS’s [report](#) that supports this tool.

## APPENDIX A

## ETIOLOGICAL FACTORS

→ Certain clues can help determine the infectious origin of diarrhea.

**Possible non-mutually exclusive etiological clues (do not replace a thorough history of the infectious diarrhea)**  
(Non-exhaustive list provided for information purposes only)

Viral	Bacterial <sup>1</sup>	Parasitic <sup>1</sup>
<ul style="list-style-type: none"> <li>• Recent contact with gastroenteritis</li> <li>• Liquid diarrhea</li> <li>• Acute diarrhea (&lt; 14 days)</li> <li>• Dehydration<sup>2</sup></li> <li>• Low fever<sup>3</sup></li> <li>• Nausea or vomiting<sup>2</sup></li> <li>• Fall and winter seasons</li> </ul>	<ul style="list-style-type: none"> <li>• Severe abdominal pain<sup>3</sup></li> <li>• High fever</li> <li>• Nausea or vomiting<sup>2</sup></li> <li>• Bloody stools</li> </ul>	<ul style="list-style-type: none"> <li>• Persistent or chronic diarrhea</li> <li>• Travel or immigration with or without bloody stools</li> <li>• Bloating and flatulence</li> <li>• Low fever<sup>3</sup></li> <li>• Nausea or vomiting<sup>2</sup></li> <li>• Weight loss, severe fatigue and/or anemia<sup>4</sup></li> </ul>

 1. The etiological clues for bacterial or parasitic gastroenteritis are less relevant in young children because it is difficult to distinguish between the two etiologies.

2. Non-distinguishable from a bacterial enteric infection

3. Non-distinguishable from other types of enteric infection

4. Non-distinguishable from other conditions

 Item concerning children

## APPENDIX B

## Risk of exposure to the most commonly encountered enteropathogens

! This list should not be used to order a specific microbiological stool analysis.

	Contact with sick or farm animals	Consumption of contaminated water	Dietary exposure <sup>1</sup>	Immigration from or recent travel to an endemic area <sup>2</sup>	Certain sexual practices with a person with gastroenteritis	Recent contact with a case of infectious gastroenteritis	Other exposures <sup>3</sup>
<i>Bacillus cereus</i>			√			Viral origin is more common	
<i>Campylobacter</i>	√	√	√		√		
<i>Helicobacter sp.</i>				√	√		
<i>Listeria</i>	√		√				
<i>Plesiomonas shigelloides</i>		√	√				
Nontyphoidal <i>Salmonella</i>	√ <sup>5</sup>	√	√		√		
<i>Shigella</i>		√	√		√		√
<i>Staphylococcus aureus</i>			√				
STEC <sup>4</sup>	√	√	√				√
<i>Yersinia enterocolitica</i>	√		√				
<i>Vibrio</i>			√				
<i>Cryptosporidium</i>	√	√	√		√		√
<i>Entamoeba histolytica</i>				√	√		
<i>Giardia Lamblia</i>		√		√	√	√	

Adapted from IDSA 2017 and WGO 2013.

1. Poorly cooked meat, spoiled food, unpasteurized milk and dairy products, restaurants, buffets, other sick persons who had the same meal, raw fish and seafood.

2. If needed, consult INSPQ's *Guide d'intervention en santé voyage*.

3. Child care, health care or laboratory worker or prison setting.

4. *E. coli* O157 is one STEC that is tested for, among others.

5. Contact with lizards, turtles, hedgehogs, hens and chicks pose a risk of exposure to *Salmonella* in young children.



Item concerning children

## APPENDIX C

### OTHER FACTORS

→ **Some chronic diseases** can cause diarrhea, such as:

- chronic inflammatory bowel disease (Crohn's disease and ulcerative colitis)
- celiac disease
- immunodeficiency
- systemic diseases (e.g., thyrotoxicosis, hypoparathyroidism, systemic sclerosis)

→ **Other causes** that can lead to diarrhea:

- history of surgery (e.g., bariatric surgery, cholecystectomy, bowel resection)
- history of pancreatic disease
- non-enteric infections (e.g., otitis, pneumonia, urinary tract infection) that can cause diarrhea in children
- type 2 diabetes medications (e.g., metformin)
- miscellaneous (abuse, uremic syndrome, toddler's diarrhea)



Item concerning children