Provincial Clinical Knowledge Topic

Acute Gastroenteritis, Adult – Emergency

V 1.0

Revision History

Version	Date of Revision	Description of Revision	Revised By
1.0	March 2017	Topic completed and disseminated	See Acknowledgements

Important Information Before You Begin

The recommendations contained in this knowledge topic have been provincially adjudicated and are based on best practice and available evidence. Clinicians applying these recommendations should, in consultation with the patient, use independent medical judgment in the context of individual clinical circumstances to direct care. This knowledge topic will be reviewed periodically and updated as best practice evidence and practice change.

The information in this topic strives to adhere to Institute for Safe Medication Practices (ISMP) safety standards and align with Quality and Safety initiatives and accreditation requirements such as the Required Organizational Practices. Some examples of these initiatives or groups are: Health Quality Council Alberta (HQCA), Choosing Wisely campaign, Safer Healthcare Now campaign etc.

Goals of Management

1. Address hemodynamic instability, when present
2. Elicit any features on history which place the patient at risk for bacterial or parasitic infection, including Clostridium difficile, and initiate diagnostic stool studies as indicated
3. Identify patients exhibiting features suggestive of toxic megacolon and/or intestinal perforation (unstable vital signs, toxic appearance, significant tenderness and/or peritonitis) and consider confirmatory imaging tests, surgical consultation and admission to hospital
4. Treat pain, nausea, vomiting, and diarrhea (when antimotility agents not contraindicated) with PO +/- IV medications if necessary
5. Address hydration with PO fluids +/- IV fluids if necessary
6. In patients suitable for discharge from the emergency department, consider outpatient gastroenterological consultation when concerns exist for inflammatory bowel disease

Clinical Decision Support

Clinical Assessment Tools

Table 1. Risk Factors for invasive bacterial gastroenteritis (indications for stool culture (C&S) [1]

- Illness duration greater than 5 days
- Severe illness (fever, more than 6 diarrheal stools per day)
- Significant bloody / inflammatory diarrhea
- Immunocompromised

Table 2. Risk Factors for Clostridium difficile infection (indications for stool Clostridium difficile toxin assay) [2]

- Recent** antibiotic use
- Recent** proton pump inhibitor use
- Recent** / current hospital admission
- Advanced age
- Prior Clostridium difficile infection

*(** within 8 weeks)*

Table 3. Risk Factors for parasitic infection (indications for stool O&P testing) [3]

Giardia / Crytosporidium screen

- Illness duration greater than 5 days
- History of drinking unfiltered water (e.g. – camping)
- Community waterborne outbreaks

Full O&P testing

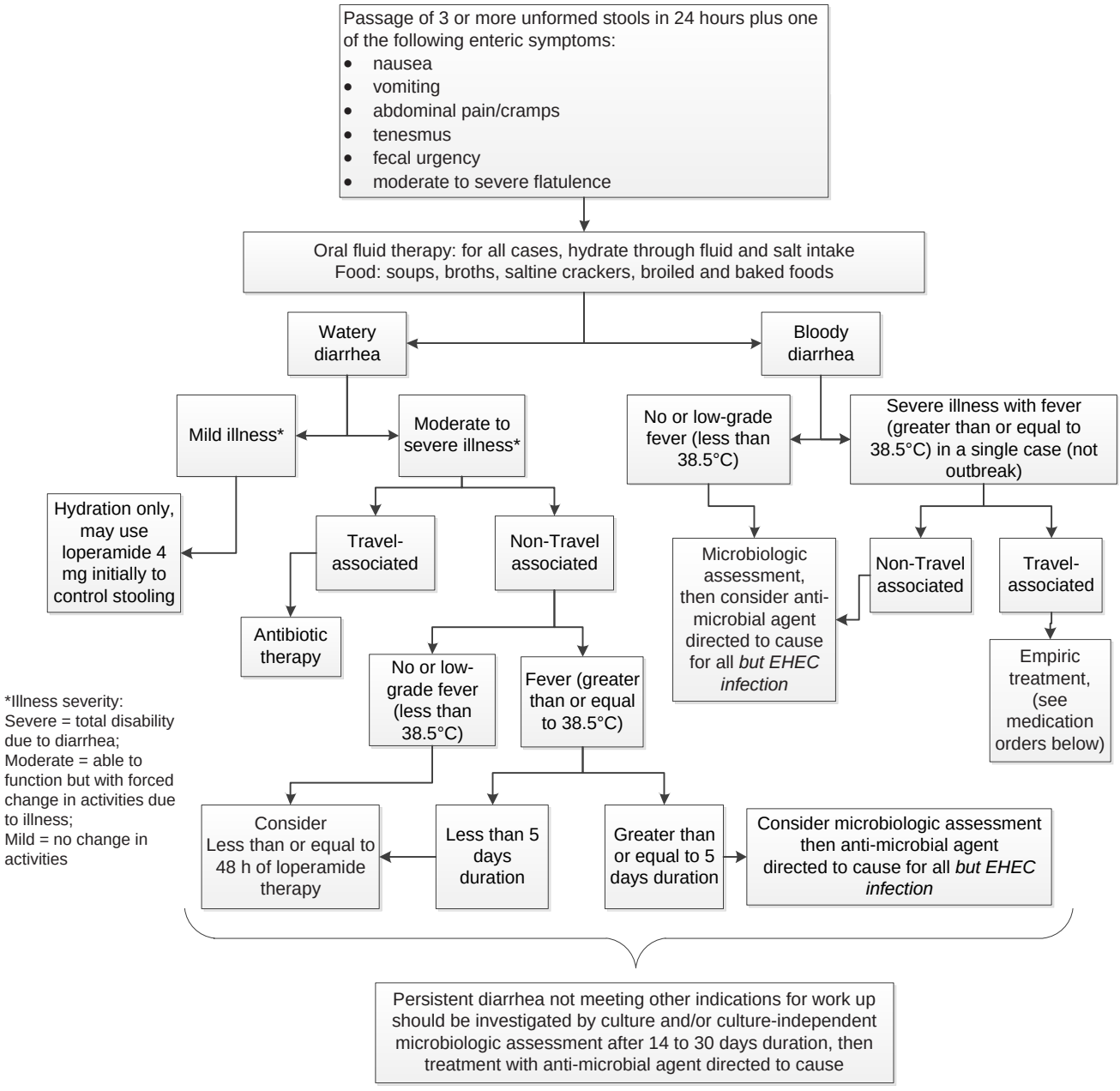
- Travel to / from endemic areas (incl. refugee / immigrant status)
- Bloody diarrhea
- Men who have sex with men
- HIV / AIDS

Table 4. Clinical Severity of Clostridium difficile infection [4,5,6]

Severity	Clinical Features
Mild / Moderate	Diarrhea present without features of severe or complicated disease
Severe	Pseudomembranous colitis on endoscopy OR AT LEAST 2 OF: • Age greater than or equal to 60 years of age • WBC count greater than 15.0 x 10^9/L • Creatinine greater than 1.5 x baseline level • Fever
Complicated	Severe disease complicated by hypotension / shock, ileus, megacolon, mental status changes, end organ failure

Figure 1. Acute Gastroenteritis (AGE) Pathway

Adapted from Riddle MS et al. Am J Gastroenterol. 2016; 111:602–622



Initial Decision Making

1. In the unstable patient:
    - Initiate hemodynamic resuscitation
        - IV fluids, blood, vasoactive medications as needed
        - Target adequate end-organ perfusion
    - Antibiotic therapy
        - Targeted to suspected pathogens; see Medications
    - Consider toxic megacolon
        - Consider screening abdominal radiography
        - Consider immediate surgical consultation

2. In the stable patient:
    - Initiate rehydration
        - IV if more severe illness or not tolerating PO rehydration
        - PO rehydration appropriate in many cases
    - Microbial testing: generally unhelpful in community acquired diarrhea
        - See Lab Investigations for indications for various stool tests
    - Antibiotics: generally discouraged in community-acquired diarrhea
        - See Medications for indications for antibiotic use in specific conditions
    - Antimotility agents (e.g. loperamide)
        - Use lowest effective dose to reduce risk of post-treatment constipation
        - May be used as an adjunct to antibiotics in travel-associated diarrhea
        - Avoid administering antimotility agents with bloody diarrhea

Order Set: Acute Gastroenteritis, Adult – Emergency

Order Set Components

Order Set Keywords: Diarrhea, Nausea / Vomiting, Colitis
Order Set Requirements: Allergies
Risk Assessment / Scoring Tools / Screening: see Clinical Decision Support section

Goals of Care Designation

☐ Goals of Care Designation: _____

Diet / Nutrition

☐ NPO
☐ NPO – May Have Sips, May Take Meds
☐ Clear Fluids
☐ Regular Diet
☐ Other Diet :_____

Patient Care

☐ Vital Signs: These orders need to be re-evaluated when the patient stabilizes or by two hours, whichever occurs first.
  ☐ as per provincial guideline
  ☐ every _____ hourly
  ☐ every _____ minute(s)
  ☐ Continuous cardiac monitoring
☐ Isolation: contact precautions *(consider if C. difficile infection suspected or confirmed)*

Intravenous Therapy

☐ Intravenous Cannula – Insert: Initiate IV
☐ IV Peripheral Saline Flush/Lock: Saline Lock

IV bolus or rapid infusion
  ☐ 0.9% sodium chloride infusion _____ mL as fast as possible

Maintenance IV Solutions
  ☐ 0.9% sodium chloride infusion at _____ mL/hour
  ☐ dextrose 5% in water - 0.9% sodium chloride infusion at _____ mL/hour
  ☐ dextrose 5% in water - 0.45% sodium chloride infusion at _____ mL/hour
  ☐ Other: _____ at _____ mL/hour

IV Solutions with Potassium
  ☐ potassium chloride 20 mmol/L in 0.9% sodium chloride infusion at _____mL/hour; STOP AFTER ONE LITRE
  ☐ potassium chloride 40 mmol/L in 0.9% sodium chloride infusion at _____mL/hour; STOP AFTER ONE LITRE
  ☐ potassium chloride 20 mmol/L in dextrose 5% - 0.45% sodium chloride at _____mL/hour; STOP AFTER ONE LITRE
  ☐ potassium chloride 40 mmol/L in dextrose 5% - 0.45% sodium chloride at _____mL/hour; STOP AFTER ONE LITRE
  ☐ Other: _____ at _____ mL/hour

Lab Investigations

Hematology

- ☐ Complete Blood Count (CBC)
- ☐ INR / PT

Transfusion Medicine

- ☐ Type and screen

Chemistry

- ☐ Electrolytes (Na, K, Cl, CO2)
- ☐ Creatinine
- ☐ Glucose random level
- ☐ Urea
- ☐ Bilirubin Total
- ☐ Albumin
- ☐ Alkaline Phosphatase Level (ALP)
- ☐ ALT
- ☐ GGT
- ☐ Lipase
- ☐ Lactate
- ☐ Blood Glucose Monitoring - POCT

Blood Gases

- ☐ Venous blood gas
- ☐ Arterial blood gas

Microbiology

- ☐ Blood Cultures
- ☐ Stool Bacterial Culture
    - See Table 1 for indications for testing
    - Also consider testing in food handlers and others posing high risk of spread to general public
- ☐ C. difficile Toxin assay
    - See Table 2 for indications for testing
- ☐ Giardia & Cryptosporidium screen
    - See Table 3 for indications
- ☐ Ova and Parasite Examination
    - See Table 3 for indications for full O&P exam, which requires completion of laboratory history form

Urine Tests

- ☐ Urine, Pregnancy - POCT

Diagnostic Investigations

☐ Electrocardiogram - 12 Lead
- *Consider for patients presenting with epigastric or substernal pain with radiation, especially in the presence of ACS risk factors. Be particularly aware that diabetic patients may present with atypical ACS and a high index of clinical suspicion is warranted*

☐ X-ray Abdomen, 2 or More Projections
☐ X-ray Chest, 1 Projection (component of abdominal X-Ray)

Medications

Antiemetics

***Avoid dimenhyDRINATE in patients 65 years of age or older due to increased risk of side effects including delirium. Suggest 25 mg for mild/moderate nausea, 50 mg for moderate/severe nausea*

☐ dimenhyDRINATE 50 mg PO once
☐ dimenhyDRINATE 25 to 50 mg PO q4h PRN for nausea/vomiting
☐ dimenhyDRINATE _____ mg PO _____

☐ dimenhyDRINATE 50 mg IV once
☐ dimenhyDRINATE 25 to 50 mg IV q4h PRN for nausea/vomiting
☐ dimenhyDRINATE _____ mg IV _____

***PO administration or slow infusion via IVPB are preferred for metoclopramide to reduce the risk of akathisia. Suggest 5 mg for mild/moderate nausea or if CrCl less than 40mL/min; 10 mg for moderate/severe nausea, and CrCl over 40mL/min*

☐ metoclopramide 10 mg PO once
☐ metoclopramide 5 to 10 mg PO q6h PRN for nausea/vomiting
☐ metoclopramide _____ mg PO _____

☐ metoclopramide 10 mg IVPB once
☐ metoclopramide 5 to 10 mg IVPB q6h PRN for nausea/vomiting
☐ metoclopramide _____ mg IVPB _____

***4 mg starting dose recommended for IV ondansetron*

☐ ondansetron 4 mg IV once
☐ ondansetron 4 mg IV to be repeated once 30 minutes after first dose PRN for nausea/vomiting
☐ ondansetron 4 mg IV q8h PRN for nausea/vomiting
☐ ondansetron _____ mg IV _____

☐ ondansetron tab 8 mg PO q8h PRN for nausea/vomiting
☐ ondansetron tab _____ mg PO _____

***Due to high cost, recommend reserving ondansetron DISINTEGRATING tab for actively vomiting patients without an IV*

☐ ondansetron DISINTEGRATING tab 8 mg PO q8h PRN for nausea/vomiting
☐ ondansetron DISINTEGRATING tab _____ mg PO_____

Antimotility Agents

Use lowest dose possible to avoid post-treatment constipation

Avoid in patients with bloody diarrhea or suspected C. difficile infection

☐ loperamide 4 mg PO once

☐ loperamide 2 mg PO every 1 hour PRN (*if PRN give after each loose bowel movement. MAX 16 mg/day from all sources*)

Antibiotics

Empiric use is discouraged in community-acquired gastroenteritis

Should be avoided in suspected or proven enterohemorrhagic E. coli (O157:H7)

Consider in patients with:

- *Moderate / severe travel-associated diarrhea*
- *Persistent (lasting longer than 7 days) or severe (temperature greater than 38.5^{o}C, greater than 6 bloody stools/day, severe abdominal pain) symptoms with positive stool cultures (very severe symptoms may also warrant empiric treatment before cultures done)*
- *Typhoidal Salmonella*
- *Non-typhoidal Salmonella in immunocompromised patient, age greater than 50 years, bacteremia, or endovascular grafts*
- *AVOID in E. coli O157:H7 infection (increased risk of Hemolytic Uremic Syndrome)*

☐ ciprofloxacin 500 mg PO every 12 hours

- *first choice for most travellers' diarrhea, Shigella enteritis, milder typhoid / paratyphoid Salmonella (unless acquired in SE Asia), high-risk non-typhoidal Salmonella, and severe / prolonged / immunocompromised Yersinia, Aeromonas, Plesiomonas, and non-cholera Vibrio*

☐ AZIthromycin 500 mg PO every 24 hours

- *first choice for pregnancy, travelers from southeast Asia and India, severe / prolonged / immunocompromised Campylobacter enteritis*

☐ ceftriaxone 2 g IV every 24 hours

- *first choice in severe/bacteremic typhoid / paratyphoid / nontyphoid Salmonella*

☐ doxycycline 300 mg PO once

- *first choice in Vibrio cholera*

For Clostridium difficile (see **Table 4** for clinical definitions)

Discontinue antibiotics, if possible; if not possible, consider change to lower-clostridium difficile infection risk antibiotics: TMP/SMX, tetracyclines, and/or metronidazole

First episode or first recurrence of uncomplicated disease:

☐ metroNIDAZOLE 500 mg PO TID x 10 days

Second recurrence of uncomplicated disease:

☐ vancomycin liquid 125 mg PO QID x 10 days AND THEN vancomycin liquid 125 mg PO every 3 days x 3 weeks

Any episode of severe disease OR any episode unresponsive to 3 to 5 days metronidazole therapy:

☐ vancomycin liquid 125 mg PO QID x 10 days

Complicated Clostridium difficile infection *(select ALL of the following)*:

☐ vancomycin liquid 125 mg PO QID x 10 days

OR

☐ vancomycin liquid 500 mg NG QID x 10 days if unable to tolerate PO

AND

☐ metroNIDAZOLE 500 mg IV every 8 hours x 10 days

AND

☐ vancomycin enema 500 mg PR every 6 hours

Antihistamine

***Consider in scombroid or allergy mediated gastrointestinal symptoms*

☐ diphenhydramine 50 mg IV once

Nonopiate Analgesia

Oral

☐ acetaminophen tab 1000 mg PO once

☐ acetaminophen tab 500 to 1000 mg PO every 4 hours PRN for pain (maximum 3000 mg/day)

☐ acetaminophen tab _____ mg PO _____

***Suggest 500 mg for mild to moderate pain, 1000 mg for moderate to severe pain*

☐ hyoscine 10 mg PO once

☐ hyoscine 10 mg IM/IV once

Opiate Analgesia

***For 'susceptible patients' defined as elderly, frail, low body mass, systemically unwell, or on medications known to cause sedation or lower blood pressure we recommend decreasing narcotic dosing by 50%.*

☑ Contact physician or nurse practitioner for reassessment if pain not controlled after administration of maximum dosage.

Oral

☐ codeine 30 mg-acetaminophen 325 mg-caffeine 15 mg 2 tabs PO once

☐ codeine 30 mg-acetaminophen 325 mg-caffeine 15 mg 1 to 2 tabs PO every 4 hours PRN for pain

☐ codeine 30 mg-acetaminophen 325 mg-caffeine 15 mg _____ tabs PO _____

☐ oxyCODONE 5 mg-acetaminophen 325 mg 2 tabs PO once

☐ oxyCODONE 5 mg-acetaminophen 325 mg 1 to 2 tabs PO every 4 hours PRN for pain

☐ oxyCODONE 5 mg-acetaminophen 325 mg _____ tabs PO _____

☐ HYDROmorphone 1 mg PO once

☐ HYDROmorphone 1 to 2 mg PO every 4 hours PRN for pain

☐ HYDROmorphone _____ mg PO _____

***Suggest 1 mg for moderate pain and 2 mg for severe pain*

Parenteral

☐ HYDROmorphone 1 mg IV once
☐ HYDROmorphone 0.5 to 1 mg every 10 minutes PRN for pain (maximum 3 mg total)
☐ HYDROmorphone _____ mg IV _____
***Suggest 0.5 mg for moderate pain and 1 mg for severe pain*

☐ morphine 5 mg IV once
☐ morphine 2.5 to 5 mg IV every 10 minutes PRN for pain (maximum 15 mg total)
☐ morphine _____ mg IV _____
***Suggest 2.5 mg for moderate pain and 5 mg for severe pain*

☐ fentaNYL 50 mcg IV once
☐ fentaNYL 25 to 50 mcg IV every 5 minutes PRN for pain (maximum 200 mcg total)
☐ fentaNYL _____ mcg IV _____
***Suggest 25 mcg for moderate pain and 50 mcg for severe pain*

Consults

☐ Consult Gastroenterology
☐ Consult Hospitalist
☐ Consult Internal Medicine
☐ Consult General Surgery
☐ Consult _____

Disposition Planning

1. Considerations for admission
    - Severe illness / toxic megacolon
    - Significant volume depletion with ongoing losses
    - Inability to maintain hydration orally
    - Significant comorbidities
2. Considerations for discharge
    - Non-toxic clinical appearance
    - Able to replace losses in ED and able to maintain adequate oral hydration
3. Outpatient follow-up
    - GP follow up regarding stool culture results
    - Gastroenterology referral if non-infectious / inflammatory cause for diarrhea strongly suspected (e.g. – persistent diarrhea, especially bloody, with negative stool cultures)
    - In cases of multiple C. difficile recurrence consider referral for consideration of fecal instillation therapy
4. Patient education / discharge instructions
    - My Health Alberta- Nausea and Vomiting:
        - Nausea and Vomiting: Care Instructions
    - Registered Dietitians Nutrition Services
        - Managing Nausea and Vomiting

Analytics

1. Key Outcomes
    - Reduced admission rates
    - Reduced use of IV fluids / meds
    - Appropriate use of stool testing assays
    - Use of acute gastroenteritis (AGE) pathway
2. Data Elements for Capture
    - Patient demographics
    - CEDIS presenting complaint and CTAS score
    - ED time markers (triage to physician, physician to consult and then to admission or physician to discharge) and outcome markers (identified as clinical decision unit patient (CDU), consulted for admission, admitted to ICU or ward, died)
    - ED diagnoses for ‘acute gastroenteritis’ / ‘nausea and/or vomiting’ / ‘diarrhea’ / ‘C. difficile’ using ICD-10
    - Site and Zone identifiers
    - Date and time of use of AGE order set
    - Stool investigation use
    - IV fluid use
    - IV medication use
    - Antibiotic use
    - Discharge destination
    - Discharge medications (especially antibiotics)
3. Proposed Reports
    - Number (%) of ED patients triaged as AGE and frequency this order set is applied
    - Number (%) of ED patients (by site/zone/hospital type or location [e.g. inner city]) for whom this order set is applied
    - Number (%) of ED AGE patients (by site/zone/hospital type or location [e.g. inner city]) for whom stool studies were completed
    - Number (%) of ED AGE patients (by site/zone/hospital type or location [e.g. inner city]) treated with IV fluids
    - Number (%) of ED AGE patients (by site/zone/hospital type or location [e.g. inner city]) treated with IV medications
    - Number (%) of ED AGE patients (by site/zone/hospital type or location [e.g. inner city]) admitted from the ED to ward / ICU
    - Length of stay for admitted and discharged patients with AGE
    - 72-hour ‘unplanned’ ED return visits for AGE / N&V / Diarrhea

References

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