Government of Saskatchewan

Clostridium difficile Infection (CDI)
Surveillance Protocol: Saskatchewan

Saskatchewan
Infection Prevention and Control Program

Revised March 2016

The Saskatchewan Infection Prevention and Control Program is a collaboration among Regional Health Authorities (RHAs), the Ministry of Health, and other stakeholders. Its mandate is to ensure that all participants are aware of leading infection control practices and emerging standards.

Correspondence:

Patient Safety Unit
Saskatchewan Ministry of Health
3475 Albert Street
Regina, SK S4S 6X6
PatientSafety@health.gov.sk.ca

Infection Control Coordinators:
provincialinfectioncontrolgroup@saskatoonhealthregion.ca

This document is current to March 2016.

New material in this revision is highlighted in olive green in the text.

Summary of major revisions:

Page	**Revisions**
1-2	Updated epidemiology trends and national/provincial incidence rates
2	Updated objectives to include addition of community onset HA-CDI cases
4	Added community onset HA-CDI cases to population under surveillance
4	Added community onset HA-CDI cases to inclusion criteria
5	Changed terminology from “relapse” to “recurrent”
6-7	Added section 6: HA-CDI defined by location of onset
7	Added reference to new Appendix G
11-14	Appendix A: CDI Electronic Report Form – Updated to remove questions about previous antibiotics and risk factors, and to include new treatment options
15-17	Appendix B: Sample data collection tool – Revised format and content
19-24	Appendix D: Acute Care and LTC facility codes – Updated
28	Appendix G: DARPIC Algorithm – NEW
29	Appendix H: Flowchart for CDI Surveillance – Revised to include Community Onset cases
30	Updated email address for submission of surveillance data

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Introduction

Clostridium difficile Infection (CDI), formerly referred to as *C. difficile*-associated disease (CDAD), is a virulent healthcare-associated infection that is easily spread among patients/residents. Its severe consequences for those who acquire it demand a reliable surveillance protocol in order to support outbreak investigations, monitor trends, and evaluate interventions aimed at reducing incidence.

On July 31, 2014, *Clostridium difficile* Infection was added as a Category I communicable disease with the amendments to Saskatchewan Disease Control Regulations.[1] CDI was added to the Regulations to support the Saskatchewan Infection Prevention and Control *C. difficile* Surveillance Protocol. As *C. difficile* is now reportable, all positive lab reports must be forwarded to regional Infection Control Professionals for investigation and monitoring using the current surveillance mechanisms.

This CDI surveillance protocol is intended to:

- establish standardized case definitions to allow for the consistent measurement of CDI within Saskatchewan;
- outline methods to establish baseline rates, and thereby also support the timely identification of CDI trends; and
- provide a mechanism for facilities to report and analyze data that will inform infection control departments of the success of their targeted prevention efforts.

Epidemiology

Clostridium difficile (*C. difficile*) is a gram positive, spore-forming anaerobic bacillus. It is the leading cause of healthcare-associated diarrhea in industrialized countries and has been responsible for a large number of outbreaks in Canadian hospitals (e.g. Greater Niagara General).[2]

According to a recent report prepared by the Public Health Agency of Canada through the Canadian Nosocomial Infection Surveillance Program (CNISP), the incidence of healthcare-associated CDI in Canada in 2013 was 3.99 per 1,000 admissions and 5.10 per 10,000 patient days. For the Western region (BC, Alberta and Saskatchewan), the rate of CDI in 2013 was 3.66 per 1,000 admissions and 4.86 per 10,000 patient days.[3] It is important to note, however, that these rates are not representative of all healthcare facilities, but only of those that participate in CNISP. These are, for the most part, large tertiary care hospitals.

Presently, there is limited Canadian surveillance information about the risk of CDI in smaller community hospitals and long-term care facilities. This is a concern because most residents in long-term care facilities are older adults and many have been exposed to antibiotics, both important risk factors for CDI. Older adults are also at an increased risk of severe CDI complications, as patients 60-90 years of age are twice as likely to die of CDI or experience severe CDI.[4]

Recent studies suggest that the epidemiology of healthcare-associated CDI is changing. Although CDI continues to be a healthcare-associated infection, with 94% of all CDI being related to a recent healthcare

[1] Saskatchewan Ministry of Health, "Table 1: Category I Communicable Disease".
[2] Provincial Infectious Disease Advisory Committee (PIDAC), "Annex C: Testing, Surveillance and Management of *Clostridium difficile*", 3.
[3] Public Health Agency of Canada, "Antimicrobial Resistant Organisms (ARO) Surveillance: Surveillance Report for Data from January 1 2009 to June 30 2014", 3.
[4] Miller, Gravel, Mulvery, et al., 200.

exposure, location of onset of these infections has begun to shift from acute care hospitals (87% of CDI cases in 1986) to long-term care (LTC) facilities or outpatient settings. Of all healthcare-associated CDIs reported to the Emerging Infections Program in the US in 2010, 75% had their onset outside of hospitals, and 52% of the CDIs treated in hospitals were present on admission.[5]

Objectives

The objectives of surveillance are to:

- Determine the incidence and burden of illness associated with healthcare-associated *C. difficile* (HA-CDI);
- Identify CDI cases by location of symptom onset (i.e. healthcare-onset or community-onset);
- Describe the epidemiology of primary and recurrent HA-CDI infections in Saskatchewan;
- Identify incidence trends and potential outbreaks;
- Determine the proportion of patients with CDI who develop recurrent infection;
- Identify trends in severity and complications related to infection (e.g. colectomy, ICU admissions, etc.); and
- Provide feedback and interpretation:
  - from the provincial Infection Control Coordinator to health regions; and
  - from regional infection control departments to regional stakeholders including point of care staff, managers, directors and senior leadership.

Methodology

1. Surveillance Design

The Saskatchewan surveillance program provides a standardized method to collect and analyze data, and to report on *C. difficile* infections in the province. This depends on the identification of CDI cases through the use of positive laboratory reports.

Identification using laboratory reports requires the infection control practitioner (ICP) to determine if the patient/resident meets the CDI case definition to be included for surveillance. This is important because surveillance definitions are not necessarily the same as clinical definitions and may not be appropriate for clinical decision-making and treatment. CDI cases are identified through active surveillance which involves reviewing the patient/resident file, notes or records, nurses' logs, and perhaps even interviewing the patient or resident.

The *C. difficile* surveillance information collected by the ICP is used to complete the CDI Electronic Report Form. The CDI Electronic Report Form (Appendix A) is briefly summarized below by section heading.

Note: The term "patient" is used to refer to acute care patients and/or long-term care residents, unless otherwise specified.

[5] CDC MMWR 2012; 61, 160.

1. Facility Information
   (a) Identifies where CDI cases are occurring within a health region by the type of care received (acute, long-term care or outpatient), and by facility/unit.
   (b) In instances where *C. difficile* cases are identified as part of a healthcare facility gastrointestinal outbreak investigation, the health region 'Outbreak Number' shall be recorded. The outbreak number is used to identify any CDI cases identified as part of the outbreak investigation. The outbreak number is obtained by the ICP from the regional Public Health Unit. An example of an outbreak number is: RQHR - YYYY - ###.
2. Lab and Clinical Information
   (a) Captures information about the patient/resident while admitted in the healthcare facility or during their outpatient visit. (e.g. symptom onset date, admission date, diagnosis date, specimen collection date, initial medical treatment following diagnosis, etc.).
   (b) The 'Diagnosis Date' is automatically determined by the CDI Electronic Report Form. The diagnosis date is based on the date of the patient's symptom onset, or the laboratory specimen submission date, whichever occurs first.
3. Patient Information and History
   (a) A unique 'Patient Identification Number (PIN)' is assigned to each CDI case. The purpose of the PIN is to link the surveillance information collected to complete the CDI Electronic Report Form with the actual patient health record from which the surveillance information was acquired. The PIN will be useful in instances where a review of the patient's health record is needed to complete a CDI investigation. Each health region shall decide what unique PIN is used (e.g. MRN). To be effective, the PIN should be used consistently by the ICPs within each respective health region. The PIN is not used by the provincial Infection Control Coordinator.
   (b) Captures patient information such as age and sex. Please note that it is only necessary to fill in the patient's date of birth **OR** age at time of diagnosis. If date of birth is provided, the CDI Electronic Report Form will automatically calculate age.
   (c) Identifies patients admitted into a healthcare facility in the past 4 weeks.
   (d) Information captured in this section helps determine where symptom onset occurred (HO or CO), if the patient meets the case definitions for HA-CDI and if the patient is experiencing a primary CDI episode or a recurrence (i.e. has had a CDI diagnosis in the previous 8 weeks).
4. Complications and Patient Outcomes
   (a) Captures ICU admission, colectomy due to CDI, and death directly or indirectly related to CDI.
   (b) The CDI outcome is determined either when the patient is discharged from hospital **OR** 30 days after the CDI diagnosis, **whichever occurs first.** Patient outcome is categorized as: discharged from facility, still in facility, transferred to another facility, deceased or unable to determine. CDI patients who have been discharged and readmitted within the "30-day outcome window" are classified as discharged.

The CDI Electronic Report Form should be completed within **<u>one month</u> (30 days)** of identifying a confirmed CDI case. The surveillance information should be submitted quarterly to the designated provincial Infection Control Coordinator within 45 days of the end of the reporting quarter (e.g. Q1 ends June 30; submission deadline is August 15). This takes into account the 30-day outcome follow-up information needed to complete each CDI case record (see Appendix I for quarterly data submission instructions).

The provincial Infection Control Coordinator reviews the surveillance information submitted by health regions, and may contact the health region ICPs to provide clarification. The provincial Infection Control Coordinator interprets the surveillance data to create a surveillance report. This report is shared with the regional infection control practitioners.

2. Population Under Surveillance

Only patients or residents admitted into a hospital or long-term care facility at the time the CDI diagnosis is made, **OR** who had been acute care inpatients/long-term care residents in the 4 weeks prior to diagnosis are included for surveillance.

Saskatchewan CDI surveillance inclusion criteria include:[6]

- ONE year of age and older;
- admitted to an acute care unit (this includes patients awaiting placement on acute care units, patients admitted to your facility but who remain in the emergency room once admitted, 'outpatients' in ER who have been there for >3 days, and patients who are discharged after the date of diagnosis, but before the laboratory results are received);
- in a mental health inpatient ward/unit;
- residents in long-term care facilities; and
- patients who were discharged from a healthcare facility in the previous 4 weeks and return to an outpatient* unit/facility with a new onset of CDI.

  *Outpatient units may include, but are not limited to, the following:
  - Cancer Centre
  - Dialysis Unit
  - Emergency Room (not admitted)
  - Physician Clinic or Office

3. Confirmatory Diagnostic Testing

Diagnostic testing for *C. difficile* is performed by health regions using either a two-step assay quick test or polymerase chain reaction (PCR) testing. Both tests have a turnaround time of less than 24 hours. Health regions that do not have the capability to conduct onsite confirmatory testing must send specimens to the Saskatchewan Disease Control Laboratory (SDCL) or to another accredited laboratory.

4. Case Definition for Surveillance and Reporting CDI

A patient is identified as a CDI case if: [7]

- s/he has diarrhea, or fever, abdominal pain and/or ileus, **AND** a laboratory confirmation of a positive toxin assay or PCR positive for *C. difficile*; **OR**
- s/he has a diagnosis of pseudomembranes on sigmoidoscopy or colonoscopy, or has a histological/pathological diagnosis of CDI; **OR**
- s/he has a diagnosis of toxic megacolon.

[6] CNISP, "2015-2017 Surveillance for *Clostridium difficile* infection (CDI)", 6.
[7] CNISP, "2015-2017 Surveillance for *Clostridium difficile* infection (CDI)", 3-4.

Diarrhea (watery or unformed stool that takes the shape of the specimen collection container) is defined as one of the following:

- 3 or more unformed stools in a 24-hour period for at least 1 day and new or unusual for the patient;
- 6 or more watery stools in a 36-hour period; or
- 8 or more unformed stools over 48 hours.

Note: If the information about the frequency and consistency of diarrhea is not available, a toxin-positive stool is considered as a case.

Primary Case:[8]

- A new CDI diagnosis **OR** a CDI diagnosis > 8 weeks after the first toxin-positive assay.

Recurrent CDI:[9,10]

- A CDI diagnosis that occurs >2 weeks and <8 weeks after being diagnosed with the primary episode of CDI, providing the patient was treated successfully for the primary episode and symptoms of CDI resolved completely.

Tracking recurrent CDI cases is important for surveillance as it is estimated that "individuals infected with CDI, who initially respond to antimicrobial therapy, have a 15 to 35% chance of having a recurrence. About 50% of this group recurs a second or third time after cessation of appropriate therapy."[11] Recurrent CDI can result from either the "re-ingestion of spores from the environment or from the persistence of spores in the gastrointestinal tract following antibiotic therapy."[12] The main reason for monitoring recurrent CDI is to provide insight into the effectiveness of treatment.[13]

Continuation of Existing *C. difficile* Infection

In some instances, healthcare providers may resample a CDI case less than 2 weeks after the initial diagnosis is made. Resampling of a confirmed CDI case is not considered best practice as the "toxin may remain at low levels in stool for several days or weeks and is therefore not helpful in determining further treatment options or discontinuation of contact precautions."[14] To deal with these cases, all specimen submissions that are taken less than 2 weeks after the initial diagnosis date are considered to be the continuation of the current CDI episode.[15]

Note: Continuing CDI cases do NOT need to be entered into the CDI Electronic Report Form. However, if entered, the CDI Case Definition will be displayed as 'continuing', indicating that the current and previous diagnosis dates are less than 2 weeks apart.

[8] CNISP, "2015-2017 Surveillance for *Clostridium difficile* infection (CDI)", 3.
[9] CNISP, "2015-2017 Surveillance for *Clostridium difficile* infection (CDI)", 5.
[10] APIC, "Guide to the Elimination of *Clostridium difficile* in Healthcare Settings", 20.
[11] CNISP, "2015-2017 Surveillance for *Clostridium difficile* infection (CDI)", 2.
[12] Maroo and Lamont, 1315.
[13] APIC, "Guide to the Elimination of *Clostridium difficile* in Healthcare Settings", 23.
[14] Saskatchewan Ministry of Health, "Guidelines for the Management of *Clostridium difficile* Infection (CDI) in all Healthcare Settings", 13.
[15] APIC, "Guide to the Elimination of *Clostridium difficile* in Healthcare Settings", 20.

5. Clostridium difficile Infection Defined by Exposure[16,17]

A CDI case is classified as either healthcare-associated (HA-CDI) or community-associated (CA-CDI) based on the symptom onset and the patient's healthcare encounter history in the last four (4) weeks.

Note: The term "healthcare" applies to both hospital (acute care) and long-term care facilities.

Healthcare-associated CDI YOUR Facility (HA-CDI-Y):

- The patient's CDI symptoms began ≥ 3 days after admission to the reporting healthcare facility; **OR**
- The patient's symptoms began in the community or < 3 days after admission to the reporting facility, **AND** the patient was admitted to the reporting facility for a period of ≥ 3 days in the past 4 weeks.

Healthcare-associated CDI ANOTHER Facility (HA-CDI-AF):

- The patient's CDI symptoms began in the community or < 3 days after admission to the reporting healthcare facility, **AND** the patient had been admitted to **ANOTHER** healthcare facility in your (or another) health region for a period of ≥ 3 days within the previous 4 weeks.

The purpose of capturing **HA-CDI-AF** is that hospitalization carries an independent risk of acquiring CDI. The use of this definition will help to distinguish true community onset cases from cases discharged from a healthcare facility in the previous 4 weeks.[18] **HA-CDI-AF** cases are attributed to the facility from which the patient was last discharged. This information is captured by the CDI Electronic Report Form (Appendix A) in the 'Patient History' section.

The appropriate follow-up by the ICP with a potential **HA-CDI-AF** case is to contact the ICP from the previous healthcare facility and/or region where the patient was admitted. However, to prevent duplication, data entry into the CDI Electronic Report Form will be performed ONLY by the ICP in the facility/health region where the person was diagnosed.

Community-associated CDI (CA-CDI): [19]

- CDI symptoms began in the community or < 3 days after admission to a healthcare facility, provided that symptom onset was > 4 weeks after the patient was discharged from any healthcare facility.

Note: CA-CDI cases do NOT need to be entered into the CDI Electronic Report Form. However, if entered, the CDI Exposure Definition will be displayed as 'CA-CDI', and further data entry will be disabled (i.e. will skip to bottom of the form for initials of data entry clerk).

6. Healthcare-Associated CDI Defined by Location of Onset[20]

CDI case patients with HA-CDI are further defined by the location of symptom onset (or specimen collection), as follows:

Healthcare facility-onset (HO):

- The patient's CDI symptoms began ≥ 3 days after admission to a healthcare facility.

[16] Provincial Infection Control Network of British Columbia (PICNet), **"**PICNet Surveillance Protocol for *Clostridium difficile* Infection (CDI) in BC Acute Care Facilities", 5.
[17] CNISP, "2015-2017 Surveillance for *Clostridium difficile* infection (CDI)", 4.
[18] McDonald, Coignard, Dubberke et al., 144.
[19] CNISP, "2015-2017 Surveillance for *Clostridium difficile* infection (CDI)", 4.
[20] McDonald, Coignard, Dubberke et al., 144.

Community-onset (CO):

- The patient's symptoms began in the community or < 3 days after admission to any healthcare facility, provided that symptom onset was < 4 weeks from the patient having an admission to the reporting facility for a period of ≥ 3 days.

7. Outbreak Identification

The Saskatchewan surveillance program will provide baseline rates to monitor the incidence of CDI provincially, regionally, and by healthcare facility. Knowledge of CDI baseline rates will assist ICPs to better anticipate and manage potential outbreaks in a timely manner. Ontario's Provincial Infectious Diseases Advisory Committee (PIDAC)[21] states: "Following consultation between the facility and the local public health unit, decisions on the declaration of an outbreak will be made based on the following criteria:

- There has been a significant (as determined by the facility and the local public health unit) increase in CDI numbers or rate compared to own baseline and/or that of comparator facilities.
- Recognized control measures are in place and are being used.
- There is epidemiologic evidence of ongoing nosocomial transmission on the ward/unit or facility."

The Saskatchewan Ministry of Health "Communicable Disease Manual" enteric outbreak definition will continue to be used to define potential *C. difficile* outbreaks, with an enteric outbreak defined as "two (2) or more residents/clients and/or staff members that are exhibiting signs and symptoms of gastrointestinal illness over a twenty-four (24) hour period."[22] Sections 9-50 to 9-55 of this manual provide detailed information for the management of an outbreak of enteric illness, including CDI.

8. Complications and Patient Outcomes

Complications and adverse outcomes may include ICU admission, colectomy due to CDI, or death directly or indirectly related to CDI. This information is collected 30 days after the positive diagnosis, or at the time of discharge, if within 30 days. Discharged patients are lost to further follow-up.

CDI Attributable Death

Cases in which a patient died within 30 days of the CDI diagnosis should be assessed by a pathologist or delegate to determine if the death was attributable to CDI. In the absence of documentation to indicate how CDI is related to death, the "Death Attribution Rules for patients infected with *C. difficile*" (DARPIC) algorithm may be used (Appendix G). The categories are as follows:

- CDI **directly** related to patient's death if the patient had no other underlying condition that would have caused death during this hospitalization.
- CDI **contributed** to the patient's death if CDI contributed to the death, but was not its primary cause (i.e. CDI exacerbated an existing disease condition that led to the patient's death).
- CDI **unrelated** to the patient's death if the patient died from causes unrelated to CDI (i.e. a pre-existing disease condition let to the patient's death)
- Relation of CDI to patient's death is deemed to be **indeterminate** if death causality cannot be determined with confidence.

[21] Provincial Infectious Disease Advisory Committee (PIDAC), "Annex C: Testing, Surveillance and Management of *Clostridium difficile*", 18.
[22] Saskatchewan Ministry of Health, "Communicable Disease Manual, Section 9: Outbreaks in Long Term Care and Integrated Facilities", Section 9-52, 1.

Information may be obtained from patient charts, nurses' logs, laboratory reports, nursing/medical staff, etc. ICPs are encouraged to participate in medical rounds to facilitate data collection.

9. Rate Calculation

Healthcare-associated CDI incidence rates are expressed as the number of new cases per 10,000 patient days,[23] as increased length of stay in hospital is directly related to an increased risk of CDI. If CDI rates are high compared to other facilities, or if an outbreak is discovered, it would be beneficial to stratify rates by patient location to target control measures.[24]

Numerator Data

- The total number of **new** HA-CDI cases identified during the surveillance quarter. This number will be pulled from the EpiData database that is exported to an Excel spreadsheet and sent to the Infection Control Coordinators at the end of each quarter. It includes cases that were defined as HA-CDI-Y as well as any HA-CDI-AF cases that were attributed to a facility in your region.

Denominator Data

- The appropriate denominator used to determine CDI rates is 'patient/resident days'. Denominator data (estimated from other provincial data sources) is provided to regional ICPs (see Appendix F). ICPs may change these numbers if they are not reflective of the current situation (e.g. due to bed closures), or if the ICP is able to refine the estimate provided.
- Newborns are excluded from the denominator data.

10. Data Analysis

Provincial and health region CDI rates are calculated by reporting quarter and year. An example of how rates are calculated is shown below.

Healthcare-associated CDI incidence rate (per 10,000 patient/resident days):

HA-CDI = ([# of new HA-CDI-Y cases + # of new HA-CDI-AF cases that have been attributed to your facility] ÷ [# of patient/resident days in your facility]) x 10,000

NOTE: The number of HA-CDI-AF cases, as well as their risk factors, will be counted in the facility/region to which the case is attributed. However, the treatment and outcomes for the HA-CDI-AF cases will be assumed to have occurred, and will therefore be counted, in the region/facility in which the case was diagnosed (unless otherwise indicated).

Example: A patient is diagnosed in an acute care facility in Sun Country Health Region (SCHR) but is deemed to have developed the infection in a facility in Regina Qu'Appelle Health Region (RQHR).

- The case will be included in the HA-CDI incidence rate for RQHR, and the risk factors will be incorporated into the RQHR descriptive statistics.
- The information on treatment following diagnosis, as well as patient outcomes, will be incorporated into the descriptive statistics for SCHR (assuming this care took place following diagnosis).

[23] Cohen, Gerding, Johnson et al., 431.
[24] Cohen, Gerding, Johnson et al., 431.

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Appendix A: CDI Electronic Report Form

EpiData Entry software is used to collect data for the Saskatchewan surveillance program. Below is a summary of the dataset captured by the EpiData Entry CDI Electronic Report Form.

FACILITY INFORMATION	
Health Region	Values listed in Appendix C.
Type of Patient Care Received on Diagnosis (Dx) Date	1 Acute care 2 Long-term care 3 Outpatient
Facility Code	Values listed in Appendix D. Select 999 for outpatient facilities or if an acute or long-term care facility does not appear in Appendix D.
Name of Other Facility	Free text. (e.g. Dr. Smith's office, "new" hospital).
Patient Care Unit when CDI diagnosis made	1 Medical Unit 2 Surgical Unit 3 Combined Medical/Surgical 4 ICU 5 Maternity 6 Women's Health 7 Pediatrics 8 Psychiatric Unit 9 Rehabilitation Unit 10 Oncology 50 Long-term Care 99 Outpatient **Note:** This is the unit the patient was on when diagnosed with CDI. Select 99 if patient received outpatient services while in a healthcare facility
Name of Other Patient Care Unit	Free text. (e.g. Emergency, renal dialysis).
Outbreak Number	Free text. Obtained from the region's Public Health Unit if the CDI case is associated with an outbreak (e.g. RQHR - YYYY - ###).
LAB AND CLINICAL INFORMATION	
Admission Date	dd/mm/yyyy **Note:** For outpatient, use date of outpatient service.
Underlying/Admitting Diagnosis	Free text.
Symptom Onset Date	dd/mm/yyyy
Specimen Collection Date	dd/mm/yyyy
Date specimen results received	dd/mm/yyyy
Diagnosis (Dx) Date	dd/mm/yyyy **Note:** Autofilled with Symptom Onset Date **OR** Specimen Collection Date, whichever occurs first.
Was there initial medical treatment after CDI diagnosis?	(Y)es (N)o (U)nable to determine

Sub question: Indicate (Y)es, (N)o **OR** (U)nable to determine for each treatment. **NOTE:** If patient was given anti-diarrheal medication, probiotics, monoclonal antibodies, or had a fecal microbiota transplant (FMT) following diagnosis, enter in "Other".	• Previous antibiotic treatment discontinued • Oral Metronidazole (Flagyl) • IV Metronidazole (Flagyl) • Oral Vancomycin • Oral Fidaxomycin • Other (free text)
Sub question: Indicate date CDI therapy started (if applicable)	dd/mm/yyyy
PATIENT INFORMATION AND HISTORY	
Unique Patient Identification Number (PIN)	Number selected by ICPs to represent patient (e.g. MRN, etc.). CAUTION: Take care to ensure patient ID # duplication is avoided
Date of Birth **OR** Age (in years) on diagnosis date	dd/mm/yyyy Free text.
Age at Diagnosis	**Note:** This field is autofilled.
Sex (M/F) (as identified by the patient)	M Male F Female
Was patient previously discharged within 4 weeks of Dx date?	(Y)es (N)o (U)nable to determine **Note:** Previous admission must have been for ≥ 3 days
Sub-question: Previous discharge date	dd/mm/yyyy
Sub-question: Previous admission date	dd/mm/yyyy
Sub-question: Previously discharged from?	1 Previously discharged from **same** facility (or RHA) as diagnosis 2 Previously discharged from **a different** facility (or RHA) **Note:** If "same facility" is selected, the health region and facility code fields autofill with the values from the 'Facility Information' section. However, you can still make changes (e.g. if the facility or type of care is different).
Sub-question: Health Region of previous discharge	Values listed in Appendix C. Select 99 if previous discharge occurred out of province.
Sub-question: Type of patient care received during previous admission	1 Acute care 2 Long-term care
Sub-question: Facility Code	Values listed in Appendix D. Select 999 if an acute or long-term care facility does not appear in Appendix D.

Sub-question: Patient Care Unit the patient was on for previous admission	1 Medical Unit 2 Surgical Unit 3 Combined Medical/Surgical 4 ICU 5 Maternity 6 Women's Health 7 Pediatrics 8 Psychiatric Unit 9 Rehabilitation Unit 10 Oncology 50 Long-term Care 99 Other **Note:** This is the unit the patient was on during their previous admission. Select 99 if patient was on a unit not listed.
Sub-question: Name of Other Previous patient care unit/wing (if applicable)	Free text.
Was the patient previously diagnosed with CDI within 8 weeks of Dx Date?	(Y)es (N)o (U)nable to determine
Sub-question: If yes, date patient was previously diagnosed with CDI.	dd/mm/yyyy **Note:** Previous diagnosis date is the previous symptom onset date or specimen collection, whichever occurred first.
Sub-question: Date previous symptoms resolved (if known)	dd/mm/yyyy
Was patient treated for previous CDI episode?	(Y)es (N)o (U)nable to determine
Sub question: Indicate (Y)es, (N)o **OR** (U)nable to determine for each treatment. **NOTE:** If patient was given anti-diarrheal medication, probiotics, monoclonal antibodies, or had a fecal microbiota transplant (FMT) following diagnosis, enter in "Other".	• Previous antibiotic treatment discontinued • Oral Metronidazole (Flagyl) • IV Metronidazole (Flagyl) • Oral Vancomycin • Oral Fidaxomycin • Other (free text)
Sub question: Indicate date previous CDI therapy started	dd/mm/yyyy
Saskatchewan CDI Identification Number	Autofilled as follows: Health Region ID number – Year – CDI case number
CDI Onset Definition	Autofilled based on data already entered.
CDI Exposure Definition	Autofilled based on data already entered.
CDI Case Definition	Autofilled based on data already entered.

COMPLICATIONS AND PATIENT OUTCOMES WITHIN 30 DAYS OF DIAGNOSIS	
Did patient require ICU admission?	• No • No, already in ICU • Yes, due to CDI complications • Yes, for reasons other than CDI • Unable to determine reason for ICU admission
Did the patient require colectomy due to CDI?	(Y)es (N)o (U)nable to determine
Outcome 30 days after diagnosis **OR** at the time of discharge, whichever comes first?	1 Discharged from Facility 2 Still in Facility 3 Transferred to Another Facility 4 Deceased 9 Unable to determine
Date of discharge or transfer (if applicable):	dd/mm/yyyy
If transferred, name of facility transferred to:	Free text.
If patient died, what was the date of death?	dd/mm/yyyy
If patient died, was CDI the cause **OR** contributing factor?	1 CDI was cause of death 2 CDI contributed to death 3 CDI not related to death 9 Unable to determine
DATA ENTRY INFORMATION	
Initials of data entry person	Free text.
Today's Date	dd/mm/yyyy (autofilled)

Appendix B: Sample Data Collection Tool

Initial data collection date: ____ /_____ /_____(DD/MM/YYYY) ICP initials: _____

30 day follow-up date due: ____ /_____ /_____(DD/MM/YYYY) Follow-up completed: ☐

FACILITY INFORMATION	
1) Health Region:	_____
2) Type of Care on Diagnosis Date[1] **(check one):**	☐ 1. Acute Care (inpatient) ☐ 2. LTC (resident) ☐ 3. Outpatient[2]
3) Name of Facility (e.g. RUH, Dr. Smith's office):	_____
4) Type of Patient Care Unit the patient was on at the time of diagnosis **(check one):**	☐ Medical ☐ Pediatrics ☐ Surgical ☐ Psychiatric ☐ Combined (med/surg) ☐ Rehab Unit ☐ ICU ☐ Oncology ☐ Maternity ☐ Long-term Care ☐ Women's Health ☐ Other
5) Name of Other patient care unit/wing (if applicable) (e.g. Emergency)	_____
6) Outbreak Number (if applicable):	____-_____-_____ (e.g. RQHR-YYYY-###)
LAB AND CLINICAL INFORMATION	
7) Admission Date (if diagnosed in **healthcare facility**[3]), or date of **outpatient service**:	____ /_____ /_____(DD/MM/YYYY)
8) Underlying/ Admitting Diagnosis:	_____
9) Symptom Onset Date:	____ /_____ /_____(DD/MM/YYYY)
10) Specimen Collection Date:	____ /_____ /_____(DD/MM/YYYY)
11) Specimen Results Received:	____ /_____ /_____(DD/MM/YYYY)
12) Was there medical treatment following the initial CDI diagnosis? **(If No or Unknown,** skip to question 13.)	☐ Yes ☐ No ☐ Unknown

[1] Diagnosis Date = Symptom Onset Date or Specimen Collection Date, whichever occurred first.
[2] ER, clinic or other outpatient service
[3] Acute care inpatient or LTC facility resident.

a) **If Yes**, Indicate treatment method, **AND**	☐ Abx treatment discontinued ☐ Oral Metronidazole (Flagyl) ☐ IV Metronidazole (Flagy) ☐ Oral Vancomycin ☐ Oral Fidaxomycin ☐ Other (Please specify): _____
b) Indicate date CDI therapy started:	____ /_____ /_____(DD/MM/YYYY)
PATIENT INFORMATION AND HISTORY	
13) Unique Patient Identification Number (PIN):	_____
14) Date of Birth: **OR** (only 1 required) Age, in years, at time of diagnosis:	____ /_____ /_____(DD/MM/YYYY) _____
15) Sex **(check one):**	☐ Male ☐ Female
16) Was patient previously discharged from a healthcare facility within **4 weeks** of diagnosis date? **(If No or Unknown,** skip to question 18.)	☐ Yes ☐ No ☐ Unknown
a) **If Yes,** Previous Discharge Date, **AND**	____ /_____ /_____(DD/MM/YYYY)
b) Previous Admission Date:	____ /_____ /_____(DD/MM/YYYY)
17) From which facility was the patient previously discharged[4]? **(If facility and RHA details are the same as diagnosis,** skip to question 18.)	☐ 1. Same Facility (or RHA) as diagnosis ☐ 2. A Different Facility (or RHA)
If facility or RHA details are different, complete the following:	
a) Health Region:	_____
b) Type of Patient Care received during previous admission:	☐ 1. Acute Care (inpatient) ☐ 2. LTC (resident)
c) Name of Acute or Long-Term Care Facility:	_____
d) Type of Patient Care Unit patient was on during previous admission **(check one):**	☐ Medical ☐ Pediatrics ☐ Surgical ☐ Psychiatric ☐ Combined (med/surg) ☐ Rehab Unit ☐ ICU ☐ Oncology ☐ Maternity ☐ Long-term Care ☐ Women's Health ☐ Other

[4] If patient was diagnosed during outpatient service, but had a previous admission to an Acute or LTC facility in the **same RHA**, select 'Same Facility (or RHA)'.
If patient was diagnosed during outpatient service, but had a previous admission to an Acute or LTC facility in a **different RHA**, select "Different Facility (or RHA)'.

e) Name of Other patient care unit/wing (if applicable)	_____
18) Was patient previously diagnosed with CDI within **8 weeks** of current diagnosis date? **(If No or Unknown,** skip to question 20.)	☐ Yes ☐ No ☐ Unknown
a) **If Yes,** Date of previous diagnosis, **AND**	____ /_____ /_____(DD/MM/YYYY)
b) Date previous symptoms resolved (if known):	____ /_____ /_____(DD/MM/YYYY)
19) Was patient treated for previous CDI episode?	☐ Yes ☐ No ☐ Unknown
a) **If Yes**, Indicate treatment method, **AND**	☐ Abx treatment discontinued ☐ Oral Metronidazole (Flagyl) ☐ IV Metronidazole (Flagy) ☐ Oral Vancomycin ☐ Oral Fidaxomycin ☐ Other (Please specify): _____
b) Indicate date previous CDI therapy started:	____ /_____ /_____(DD/MM/YYYY)
COMPLICATIONS AND PATIENT OUTCOMES WITHIN 30 DAYS OF DIAGNOSIS	
20) Did the patient require ICU admission? **(check one):**	☐ 1. No ☐ 2. No, already in ICU ☐ 3. Yes, due to CDI complications ☐ 4. Yes, for reason other than CDI ☐ 9. Unable to determine reason
21) Was colectomy required due to CDI?	☐ Yes ☐ No ☐ Unknown
22) What was patient outcome 30 days after diagnosis **OR** at the time of discharge, whichever occurred first?	☐ 1. Discharged ☐ 4. Deceased ☐ 2. Still in facility ☐ 9. Unknown ☐ 3. Transferred to another facility
c) Date of discharge or transfer (if applicable):	____ /_____ /_____(DD/MM/YYYY)
d) Facility patient transferred to (if applicable):	_____
e) Date of death (if applicable):	____ /_____ /_____(DD/MM/YYYY)
23) If patient died, was CDI the cause or a contributing factor[5]? **(check one):**	☐ 1. CDI was cause of death ☐ 2. CDI contributed to death ☐ 3. CDI not related to death ☐ 9. Unable to determine

Name of data entry clerk: _____

Data entered into EpiData on: ____ /_____ /_____(DD/MM/YYYY)

[5] As per Death Attribution Rules for Patient Infected with CDI (DARPIC) – Appendix G in CDI surveillance protocol

Appendix C: Health Regions

1. Sun Country
2. Five Hills
3. Cypress
4. Regina Qu'Appelle
5. Sunrise
6. Saskatoon
7. Heartland
8. Kelsey Trail
9. Prince Albert Parkland
10. Prairie North
11. Mamawetan Churchill River
12. Keewatin Yatthé
13. Athabasca Health Authority

99. Out of Province

Appendix D: Acute Care and Long-Term Care Facility Codes

HOSPITALS

RHA	Community Name	Facility Name	Facility #
Sun Country	Arcola	Arcola Health Centre	002
	Estevan	St. Joseph's Hospital	036
	Kipling	Kipling Integrated Health Centre	068
	Weyburn	Weyburn General Hospital	168
Five Hills	Assiniboia	Assiniboia Union Hospital	003
	Central Butte	Central Butte Regency Hospital	018
	Gravelbourg	St. Joseph's Hospital	046
	Moose Jaw	Dr. F.H. Wigmore Regional Hospital	096
Cypress	Herbert	Herbert & District Integrated Healthcare Facility	051
	Leader	Leader Hospital	076
	Maple Creek	Southwest Integrated Healthcare Facility	088
	Shaunavon	Shaunavon Hospital & Care Centre	144
	Swift Current	Cypress Regional Hospital	149
Regina Qu'Appelle	Balcarres	Balcarres Integrated Care Centre	005
	Broadview	Broadview Hospital	013
	Fort Qu'Appelle	All Nations' Healing Hospital	401
	Indian Head	Indian Head Hospital	058
	Moosomin	Southeast Integrated Care Centre	099
	Regina	Pasqua Hospital	130
		Regina General Hospital	129
		Wascana Rehabilitation Centre [REHAB]	501
	Wolseley	Wolseley Memorial Integrated Care Centre	173
Sunrise	Canora	Canora Hospital	016
	Esterhazy	St. Anthony's Hospital	035
	Kamsack	Kamsack Hospital	062
	Melville	St. Peter's Hospital	092
	Preeceville	Preeceville & District Health Centre	117
	Yorkton	Yorkton Regional Health Centre	176
Saskatoon	Humboldt	Humboldt District Health Complex	054
	Lanigan	Lanigan Hospital	074
	Rosthern	Rosthern Hospital	135
	Saskatoon	Royal University Hospital	142
		Saskatoon City Hospital	140
		St. Paul's Hospital	141
	Wadena	Wadena Hospital	162
	Watrous	Watrous Hospital	165
	Wynyard	Wynyard Hospital	174
Heartland	Biggar	Biggar and District Health Centre	009
	Davidson	Davidson Health Centre	026
	Kerrobert	Kerrobert and District Health Centre	064
	Kindersley	Kindersley & District Health Centre	066
	Outlook	Outlook & District Health Centre	110
	Rosetown	Rosetown & District Health Centre	133
	Unity	Unity & District Health Centre	156

RHA	Community Name	Facility Name	Facility #
Kelsey Trail	Hudson Bay	Hudson Bay Health Care Facility	053
	Kelvington	Kelvington Hospital	063
	Melfort	Melfort Hospital	091
	Nipawin	Nipawin Hospital	104
	Porcupine Plain	Porcupine Carragana Hospital	116
	Tisdale	Tisdale Hospital	153
Prince Albert Parkland	Prince Albert	Victoria Hospital	120
	Shellbrook	Parkland Integrated Health Centre	145
Prairie North	Lloydminster	Lloydminster Hospital	080
	Maidstone	Maidstone Health Complex	086
	Meadow Lake	Northwest Health Facility	090
	North Battleford	Battlefords Union Hospital	107
		Saskatchewan Hospital North Battleford (SHNB) [MENTAL HEALTH]	995
	Turtleford	Riverside Health Complex	154
Mamawetan Churchill River	La Ronge	La Ronge Health Centre	083
Keewatin Yatthé	Ile a la Crosse	St. Joseph's Health Centre	056
	La Loche	La Loche Health Centre	301
Athabasca Health Authority	Black Lake	Yutthe Dene Nakohodi Health Centre (Athabasca Health Centre)	213

LONG-TERM CARE FACILITIES

[special care homes (SCHs), and hospitals with designated institutional supportive care (ISC) beds]

RHA	Community Name	Facility Name	Facility #
Sun Country	Bengough	Bengough Health Centre [SCH]	526
	Carlyle	Moose Mountain Lodge [SCH]	535
	Carnduff	Sunset Haven [SCH]	534
	Coronach	Coronach & District Health Centre [SCH]	020
	Estevan	Estevan Regional Nursing Home [SCH]	533
		St. Joseph's Hospital [ISC beds]	036
	Fillmore	Fillmore Health Centre [SCH]	040
	Gainsborough	Gainsborough Health Centre [SCH]	044
	Kipling	Kipling Integrated Health Centre [SCH]	545
	Lampman	Lampman Health Centre [SCH]	072
	Midale	Mainprize Manor & Health Centre [SCH]	530
	Oxbow	Galloway Health Centre [SCH]	111
	Radville	Radville Marian Health Centre [SCH]	527
	Redvers	Redvers Health Centre [SCH]	536
	Stoughton	Newhope Pioneer Lodge [SCH]	537
	Wawota	Wawota Memorial Health Centre [SCH]	538
	Weyburn	Tatagwa View [SCH]	531
		Weyburn Special Care Home [SCH]	528

RHA	Community Name	Facility Name	Facility #
Five Hills	Assiniboia	Assiniboia Union Hospital [SCH]	505
	Assiniboia	Ross Payant Centennial Home [SCH]	525
	Central Butte	Central Butte Regency Hospital [SCH]	522
	Craik	Craik & District Health Centre [SCH]	021
	Gravelbourg	Foyer D'Youville Home [SCH]	517
	Lafleche	Lafleche & District Health Centre [SCH]	071
	Moose Jaw	Extendicare Moose Jaw [SCH]	518
		Pioneer Lodge [SCH]	520
		Providence Place [SCH]	523
	Rockglen	Grasslands Health Centre [SCH]	132
Cypress	Cabri	Prairie Health Care Centre [SCH]	015
	Eastend	Eastend Wolf Willow Health Centre [SCH]	511
	Gull Lake	Gull Lake Special Care Centre [SCH]	503
	Herbert	Herbert & District Integrated Healthcare Facility [SCH]	507
	Leader	Western Senior Citizens Home [SCH]	502
	Mankota	Prairie View Health Centre [SCH]	087
	Maple Creek	Southwest Integrated Healthcare Facility [SCH]	504
	Ponteix	Foyer St. Joseph Nursing Home [SCH]	512
	Shaunavon	Shaunavon Hospital & Care Centre [SCH]	516
	Swift Current	Palliser Regional Care Centre [SCH]	510
		Prairie Pioneers Lodge [SCH]	509
		Swift Current Care Centre [SCH]	508
Regina Qu'Appelle	Balcarres	Balcarres Integrated Care Centre [SCH]	781
	Broadview	Broadview Centennial Lodge [SCH]	543
	Cupar	Cupar and District Nursing Home [SCH]	783
	Fort Qu'Appelle	Echo Lodge [SCH]	782
	Grenfell	Grenfell & District Pioneer Home [SCH]	544
	Imperial	Long Lake Valley Integrated Facility [SCH]	057
	Indian Head	Golden Prairie Home [SCH]	549
	Lestock	St. Joseph's Integrated Care Centre [SCH]	079
	Lumsden	Lumsden Heritage Home [SCH]	560
	Montmartre	Montmartre Integrated Health Centre [SCH]	095
	Moosomin	Southeast Integrated Care Centre [SCH]	542
	Raymore	Silver Heights Special Care Home [SCH]	785
	Regina	Extendicare Elmview [SCH]	551
		Extendicare Parkside [SCH]	550
		Extendicare Sunset [SCH]	552
		Qu'Appelle House [SCH]	555
		Regina Lutheran Home [SCH]	556
		Regina Pioneer Village [SCH]	557
		Santa Maria Senior Citizens Home [SCH]	559
		Wascana Rehabilitation Centre [ISC beds]	501
		William Booth Special Care Home [SCH]	558
	Whitewood	Whitewood Community Health Centre [SCH]	547
	Wolseley	Wolseley Memorial Integrated Care Centre [SCH]	546

RHA	Community Name	Facility Name	Facility #
Sunrise	Canora	Canora Gateway Lodge [SCH]	772
		Canora Hospital [ISC beds]	016
	Esterhazy	Centennial Special Care Home [SCH]	778
	Foam Lake	Foam Lake Jubilee Home [SCH]	786
	Invermay	Invermay Health Centre (Invermay Lodge) [SCH]	773
	Ituna	Ituna Pioneer Health Care Complex [SCH]	784
	Kamsack	Kamsack & District Nursing Home [SCH]; Kamsack Hospital [ISC beds]	769; 062
	Langenburg	Centennial Special Care Home [SCH]	779
	Melville	St. Paul Lutheran Home [SCH]	780
	Norquay	Norquay Health Centre [SCH]	771
	Preeceville	Preeceville & District Health Centre [SCH]	774
	Saltcoats	Lakeside Manor Care Home [SCH]	777
	Theodore	Theodore Health Centre [SCH]	152
	Yorkton	Yorkton & District Nursing Home [SCH]	776
Saskatoon	Cudworth	Cudworth Nursing Home [SCH]	753
	Dalmeny	Spruce Manor Special Care Home [SCH]	797
	Duck Lake	Goodwill Manor [SCH]	751
	Humboldt	St. Mary's Villa [SCH]	793
	Langham	Langham Senior Citizens Home [SCH]	798
	Lanigan	Central Parkland Lodge [SCH]	791
		Lanigan Hospital [ISC beds]	074
	Middle Lake	Bethany Pioneer Village [SCH]	795
	Nokomis	Nokomis Health Centre [SCH]	105
	Rosthern	Mennonite Nursing Home [SCH]	599
	Saskatoon	Central Haven Special Care Home [SCH]	799
		Circle Drive Special Care Home [SCH]	817
		Lutheran Sunset Home [SCH]	806
		Oliver Lodge [SCH]	809
		Parkridge Centre [SCH]	818
		Porteous Lodge [SCH]	807
		Samaritan Place [SCH]	821
		Saskatoon Convalescent Home [SCH]	813
		Saskatoon Extendicare [SCH]	803
		Sherbrooke Community Centre [SCH]	814
		Sherbrooke Community Centre-Veteran's Unit [SCH]	819
		St. Ann's Senior Citizens' Village [SCH]	810
		St. Joseph's Home [SCH]	811
		Stensrud Lodge [SCH]	808
		Sunnyside Adventist Care Home [SCH]	815
	Strasbourg	Last Mountain Pioneer Home [SCH]	792
	Wadena	Pleasant View Care Home [SCH]	789
		Wadena Hospital [ISC beds]	162
	Wakaw	Lakeview Pioneer Lodge [SCH]	754
	Warman	Warman Mennonite Special Care Home [SCH]	816
	Watrous	Manitou Lodge [SCH]; Watrous Hospital [ISC beds]	563; 165
	Watson	Quill Plains Centennial Lodge [SCH]	790
	Wynyard	Golden Acres [SCH]	787

RHA	Community Name	Facility Name	Facility #
Heartland	Biggar	Biggar and District Health Centre [SCH]	574
	Davidson	Davidson Health Centre [SCH & ISC beds]	562
	Dinsmore	Dinsmore Health Centre [SCH]	028
	Elrose	Elrose Health Centre [SCH]	565
	Eston	Eston Health Centre [SCH]	566
	Kerrobert	Kerrobert and District Health Centre [SCH & ISC beds]	573
	Kindersley	Kindersley & District Health Centre (Heritage Manor) [SCH & ISC beds]	572
	Kyle	Kyle Health Centre [SCH]	069
	Lucky Lake	Lucky Lake Health Centre [SCH]	082
	Macklin	St. Joseph's Health Centre [SCH]	085
	Outlook	Outlook & District Health Centre [SCH]	110
	Rosetown	Rosetown & District Health Centre [SCH & ISC beds]	567
	Unity	Unity & District Health Centre [SCH]	576
	Wilkie	Wilkie & District Health Center [SCH]	577
Kelsey Trail	Arborfield	Arborfield & District Health Care Centre [SCH]	767
	Carrot River	Carrot River Health Centre [SCH]	755
	Hudson Bay	Hudson Bay Health Care Facility [SCH]	764
	Kelvington	Kelvindell Lodge [SCH]	788
	Melfort	Parkland Place [SCH]	761
	Nipawin	Pineview Lodge [SCH]	756
	Porcupine Plain	Porcupine Carragana Hospital [ISC beds]	116
		Red Deer Lodge [SCH]	765
	St. Brieux	Chateau Providence [SCH]	762
	Tisdale	Newmarket Place [SCH]	768
Prince Albert Parkland	Big River	Big River Health Centre [SCH]	590
	Birch Hills	Birchview Nursing Home [SCH]	593
	Canwood	Whispering Pine Place [SCH]	591
	Hafford	Hafford Special Care Centre [SCH]	597
	Kinistino	Jubilee Lodge [SCH]	758
	Leask	Wheatland Lodge [SCH]	592
	Leoville	Evergreen Health Centre [SCH]	077
	Prince Albert	Herb Bassett Home [SCH]	594
		Mont St. Joseph Home [SCH]	595
		Pineview Terrace Lodge [SCH]	596
	Shellbrook	Parkland Integrated Health Centre [SCH]	588
	Spiritwood	Spiritwood Health Complex [SCH]	589
Prairie North	Battleford	Battleford District Care Centre [SCH]	578
	Cut Knife	Cut Knife Health Complex [SCH]	586
	Edam	Lady Minto Health Care Centre [SCH]	033
	Goodsoil	L. Gervais Memorial Health Centre [SCH]	045
	Lloydminster	Dr. Cooke Extended Care Centre [ISC beds]	86218
		Jubilee Home [SCH]	582
		Lloydminster Continuing Care Centre [ISC beds]	86736
	Loon Lake	Loon Lake Health Centre & Special Care Home [SCH]	081
	Maidstone	Maidstone Health Complex (Pine Island Lodge) [SCH]	583
	Meadow Lake	Northland Pioneers Lodge [SCH]	587
	North Battleford	River Heights Lodge [SCH]	579
		Villa Pascal [SCH]	580
	St. Walburg	St. Walburg Health Complex [SCH]	584
	Turtleford	Riverside Health Complex [SCH]	585

RHA	Community Name	Facility Name	Facility #
Mamawetan Churchill River	La Ronge	La Ronge Health Centre [SCH & ISC beds]	757
Keewatin Yatthé	Ile a la Crosse	St. Joseph's Health Centre [ISC beds]	056
	La Loche	La Loche Health Centre [SCH]	301
Athabasca Health Authority	Black Lake	Yutthe Dene Nakohodi Health Centre (Athabasca Health Centre) [ISC beds]	548

Appendix E: EpiData Entry

EpiData Entry, Getting Started

The following information is intended to help users start using EpiData Entry and includes how to install and how to use the software.

EpiData Entry software

We are currently using EpiData Entry version: 3.1 Build: (27jan2008). The link to the EpiData website where EpiData Entry can be downloaded is http://www.epidata.dk/download.php#ee.

The EpiData Entry.exe file is found on the EpiData website under the 'EpiData Entry' heading in the English row, from here select the 'Complete Setup, 28 Jan 2008 (0.9Mb)' file.

Note: You will most likely need permission from your IT department to install the EpiData Entry software.

CDI Electronic Report Form

The provincial Infection Control Coordinator will email the CDI Electronic Report Form files to the health region ICPs when data entry is to begin. If there are no revisions to the files between quarters, ICPs may continue to enter data into the same files.

Once you receive the email with the CDI Electronic Report Form files, save each into a 'CDI Surveillance Folder' that you create for easy access. The 'CDI Surveillance Folder' should be located on your network drive so that the surveillance information can be routinely backed up by your IT department. The CDI Electronic Report Form is made up of 3 files that have the following generic format:

1. CDI_surv_dataentry_*[version#]*.qes → the questionnaire;
2. CDI_surv_dataentry_*[version#]*.chk → contains the defined report form checks; and
3. CDI_surv_dataentry_*[version#]*.rec → the surveillance data is stored here.

Again, save these files in the 'CDI Surveillance Folder.'

Display Setup

It is strongly recommended that data entry staff set up their EpiData Entry display before beginning to enter CDI cases. While this is not required, doing this will help the fields to line up properly, and creates a better print format. To adjust the way the CDI Electronic Report Form looks, please do the following:

- Open EpiData from the main screen and close the CDI Electronic Report Form. Click on 'File' (top left hand corner); select 'Options' from the menu.
- From 'Options', select the 'Show Data Form'; select the 'Calibri' font and the 12pt font size. You can also change the background colour (a grey background is recommended). Click 'OK' to save your changes.

Now, when you open the CDI Electronic Report Form, your view will be updated and the fields will align.

Shortcuts that may help with EpiData Entry

The following information can also be found in the EpiData Entry Help menu by selecting the 'Keyboard Short-cuts' option from the drop down menu. Useful keyboard short-cuts:

- **Control + P** (or from the File menu if you choose Print Data form) allows you to print the current view of the opened CDI Electronic Report Form.
- **F5 Key** is used to add additional patient notes for specific cases.

- **F9 Key** is used to bring back the drop down menu if it disappears during data entry.

To begin entry of data into EpiData

1. Run the EpiData Entry program (double click on icon from desktop).
2. When you run the EpiData Entry program you will see the main screen. At the top of the EpiData Entry screen there is a toolbar numbered from 1 to 6. Click on '**4. Enter Data'**, and an 'Open' window appears. Find where the **CDI_surv_dataentry_*[version#]*.rec** file is saved, and open it.

   Note: The **CDI_surv_dataentry_*[version#]*.rec** file cannot be directly opened by double clicking on the file.
3. Once you have opened the current **CDI_surv_dataentry_*[version#]*.rec** file, you should see the CDI Electronic Report Form. You can now start entering surveillance data.
4. It is important to enter surveillance data into the CDI Electronic Report Form in the order that the questions are laid out (i.e. top to bottom). If you need to move back and forth through the report form it is best to use the keyboard 'up arrow' and 'down arrow' keys or the Tab, (Shift Tab) key. Do not use the mouse, if possible, as using the mouse can lead to data entry errors. Controls built into the CDI Electronic Report Form file are NOT checked if you move to different fields using the mouse. If you use the mouse to move between fields during data entry you may produce invalid data.

   The only situation where using the mouse is recommended is if you wish to exit a field in which restrictions are made (e.g. a field where information must be entered). In these situations you may get caught in an endless loop (e.g. by having "must enter" in a field, and it turns out that the value was not possible for some patients/residents). This is the only situation where using the mouse is good practice during data entry.
5. When you have completed entering the required surveillance information for each CDI case, a 'Confirmation Box' will appear and ask you to save the record to the disk. Select 'Yes' to save it. Once you have saved the CDI case record, a new blank CDI Report Form will appear and you can then continue and enter the next CDI case information.

Appendix F: Sample Denominator Report Form

Below is a sample of the Denominator Report Form sent to each health region. The numbers provided are estimated from other provincial data sources. Region ICPs need only check that the numbers are reasonable. If there was a recent change (e.g. bed closures) that may have resulted in different values, enter the changes, and send back along with EpiData file (see Appendix I for how to submit quarterly data).

Flatland Health Region
2015-16 Denominator Form for CDI Surveillance

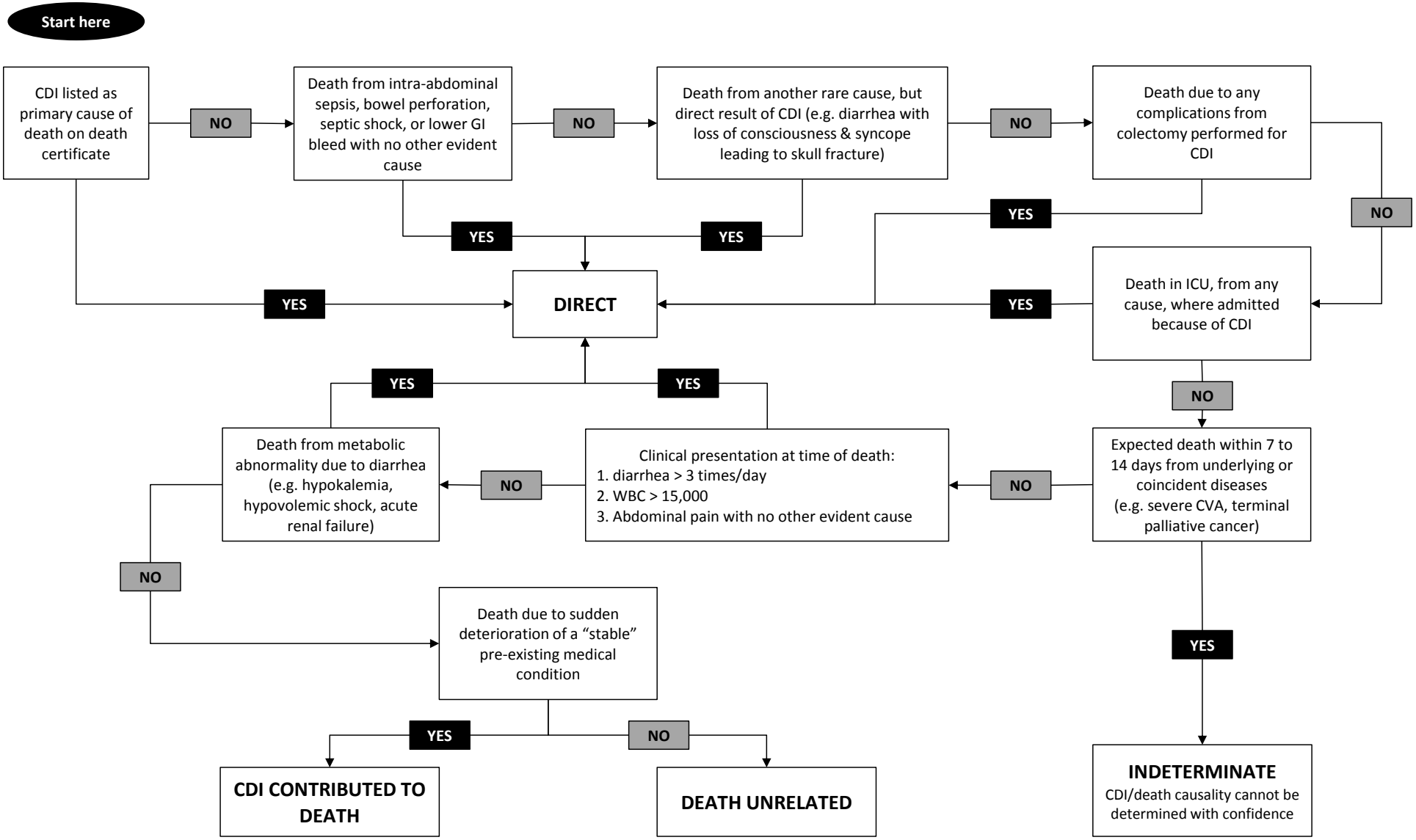
Patient / Resident Days

Facility ID	Community	Facility Name	Q1 [Apr - Jun]	Q2 [Jul - Sep]	Q3 [Oct - Dec]	Q4 [Jan - Mar]	2015-16
Hospitals							
900	Podunk	Podunk Hospital	30,000				30,000
904	Squareville	Edwin A. Abbott Memorial Hospital	1,500				1,500
							0
							0
		Sub-Total	*31,500*	*0*	*0*	*0*	*31,500*
Long-Term Care Facilities							
952	Pallukahville	Pallukah Seniors Care Centre	16,000				16,000
900	Podunk	Podunk Hospital	1,000				1,000
961	Podunk	St. Festivus Home for the Aged	6,700				6,700
969	Squareville	Squareville Flatlanders Special Care Home	2,250				2,250
913	Wysiwyg	Plainview Health Complex	3,600				3,600
							0
		Sub-Total	*29,550*	*0*	*0*	*0*	*29,550*
		Region Total	**61,050**	**0**	**0**	**0**	**61,050**

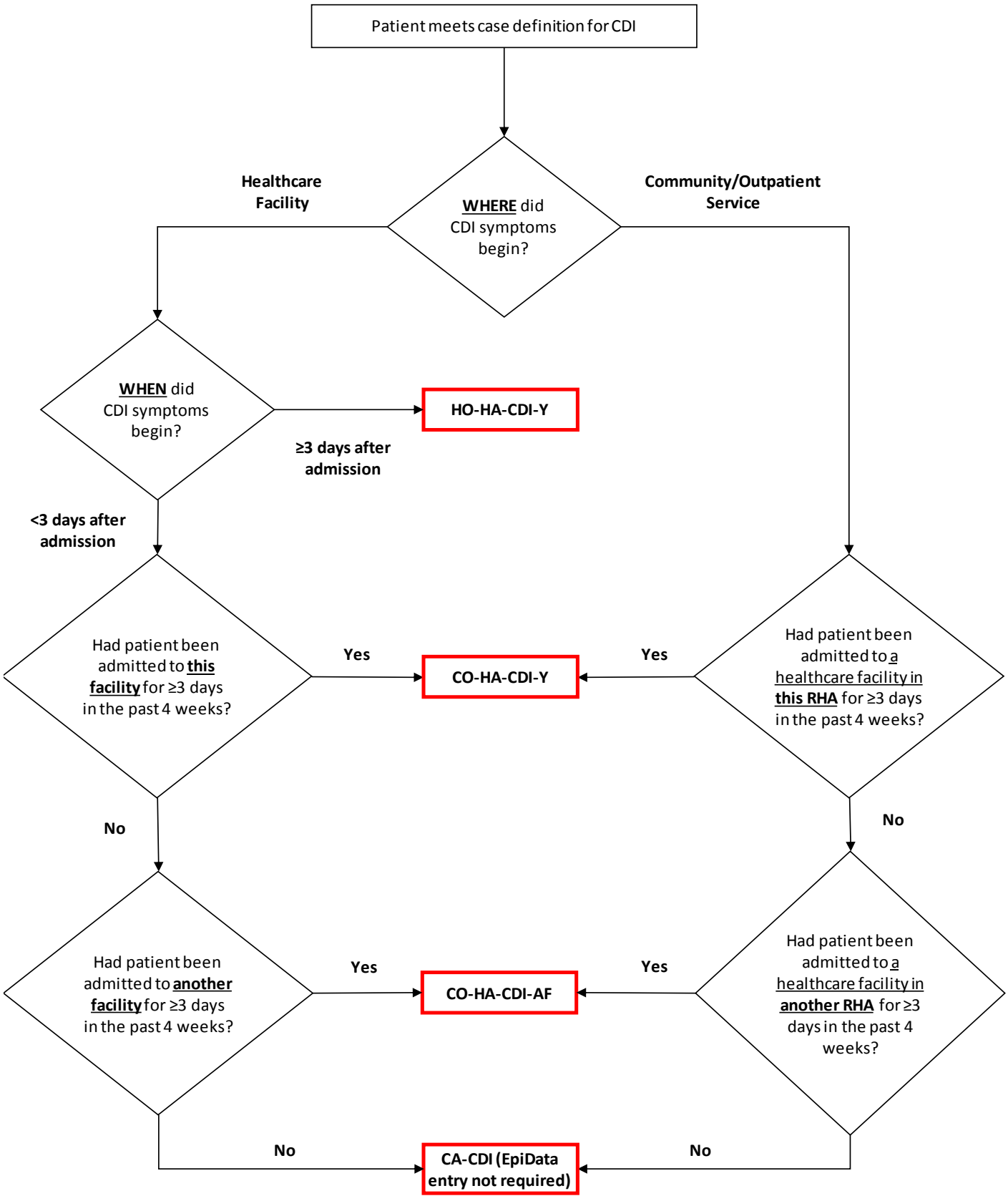
Estimates are based on days for all acute care inpatients, and for all residents in long-term care facilities. Days for newborns are excluded.

Appendix G: Death Attribution Rules For Patients Infected With *C. Difficile* (DARPIC)

(Used for ascertaining relatedness of death to CDI when death occurs within 30 days of CDI diagnosis)



Appendix H: Flowchart for CDI Surveillance



Appendix I: Quarterly Data Submission

The CDI reporting periods are based on the fiscal year. The reporting quarters are defined as follows:

Reporting Period		**Data to be submitted by:**
First Quarter	April 1 – June 30	August 15
Second Quarter	July 1 – September 30	November 15
Third Quarter	October 1 – December 31	February 15
Fourth Quarter	January 1 – March 31	May 15

Check for Errors

Each quarter, before sending your compiled surveillance data to the provincial Infection Control Coordinator, it is recommended that you first check your surveillance data for accuracy and completion. EpiData Entry has some automatic checking capabilities built into the program. These checks help to ensure that no required fields have been missed during data entry into the CDI Electronic Report Form. You can also view a summary of all the surveillance information that you have collected.

To view the summary, the data entry window must be closed. From the EpiData main screen toolbar, click on **'5. Document'**, and then select 'View Data' from the drop down list. This will open up a spreadsheet displaying all the CDI case records allowing the ICP to review each record to determine if there are any missing data elements.

Data Submission

Compiled data must be sent **each quarter** to the provincial Infection Control Coordinator by the dates above. To export your surveillance data into Microsoft Excel:

1. Open EpiData, and close the data entry window.
2. From the main screen toolbar, select '6. Export Data'.
3. From the drop down list, select the 'Excel' option and ensure that 'all records' and 'skip deleted records' are both selected.
4. EpiData Entry will then create an Excel file of your data entry within the 'CDI Surveillance Folder'. Make note of the name of the file created.
5. Open your email program (e.g. Microsoft Outlook) and create a new email.
6. The email subject title should contain the following information: health region acronym, the reporting year, and reporting quarter (e.g. SCHR-2012-Q1).
7. Using your email program, find and attach the current excel file that contains the CDI surveillance information.
8. Email the excel file, as well as any changes in the denominator form (Appendix F), to the provincial Infection Control Coordinator: provincialinfectioncontrolgroup@saskatoonhealthregion.ca

Appendix J: Antibiotic and Proton Pump Inhibitor Supplement for CDI Surveillance

Note: This list is comprehensive, but does not include every antibiotic and indication for use.

Class	Type and/or Common Indications for Use	Generic Name	Brand Name®
β-lactams	Inhibit cell wall synthesis		
Cephalosporins Action: bind to penicillin-binding proteins	1st generation • Mainly skin and soft tissue infections • Good gram pos+ and modest gram neg- activity	**cefazolin** **cephalexin**	generic generic
	2nd generation • Some respiratory and abdominal infections • Enhanced gram neg- activity	**cefuroxime sodium** **cefuroxime axet**il **cefaclor** **cefprozil** **cefoxitin**	generic Ceftin, generic Ceclor, generic Cefzil, generic generic
	3rd generation • Oral - broad range mild to moderate skin infections • Parenteral - serious infections like meningitis or HCAIs	**cefotaxime** **ceftazidime** **ceftriaxone**	Claforan, generic Fortaz, generic generic
	4th generation • Serious infections or resistant organisms • Broad spectrum against gram neg- bacteria	**cefepime**	Maxipime, generic
Penicillins Action: inhibit bacterial enzymes	penicillin • Aerobic gram pos+, some fastidious aerobic gram neg- activity	**penicillin G benzathine** **penicillin G sodium** **penicillin V**	Bicillin L-A Crystapen,generic generic
	aminopenicillins • Wider range of infections	**amoxicillin** **ampicillin**	generic generic
	penicillinase-stable penicillins • penicillinase-producing *Staphylococcus* spp. activity	**cloxacillin**	generic
β-lactam/ β-lactamase inhibitor combinations	Most gram pos+ and gram neg-	**amoxicillin-clavulanic acid** **piperacillin-tazobactam** **ticarcillin-clavulanic acid**	Clavulin, generic Tazocin Timentin
Monobactams	Aerobic gram neg- only	**aztreonam**	Cayston
Arbapenems	Carbapenems • Broad spectrum against non-carbapenemase producing aerobic and anaerobic gram pos+ and gram neg-	**doripenem** **ertapenem** **imipenem-cilastatin** **meropenem**	Doribax Invanz Primaxin, generic Merrem, generic

Class	Type and/or Common Indications for Use	Generic Name	Brand Name®
NON β-lactams			
Licosamines Action: inhibit protein synthesis	• Strep and Staph infections, respiratory infections and lung abscesses • Aerobic gram pos+ cocci and anaerobes	**clindamycin**	Dalacin C, generic
Fluoroquinolones Action: target DNA and cell division	• Sepsis, urinary tract infections, community acquired pneumonia, bacterial prostatitis, bacterial diarrhea • Effective against many gram pos+ and gram neg-	**ciprofloxacin** **levofloxacin** **moxifloxacin** **ofloxacin** **norfloxacin**	Cipro, Cipro XL, generic Levaquin, generic Avelox generic generic
Sulphonamides Action: inhibit folate pathways	• UTIs and some burns • Some gram pos+ and gram neg- activity	sulfamethoxazole-trimethoprim **trimethoprim**	Septra, generic (regular & double strength) generic
Macrolides Action: inhibit protein synthesis	• Fastidious gram pos+ and gram neg- bacteria	**azithromycin** **clarithromycin** **erythromycin**	Zithromax, Z-PAK, Zmax SR, generic Biaxin, Biaxin BID, Biaxin XL, generic Eryc, generic
Aminoglycosides Action: inhibit bacterial protein synthesis	• Aerobic gram neg- activity • Can be used at high doses in combination with other antibiotics against gram pos+	**amikacin** **gentamicin** **tobramycin**	generic generic TOBI, generic
Glycopeptides Action: inhibit cell wall synthesis	• Aerobic gram pos+ activity	**vancomycin**	Vancocin, generic
Tetracylines Action: inhibit protein synthesis	• Mycoplasmal infections, Lyme disease, Chlamydial infections • Gram pos+ and gram neg-	**doxycycline** **minocycline** **tetracycline**	Vibra-Tabs, Vibramycin, generic Minocin, generic generic
Glycylcyclines		**tigecycline**	Tygacil
Nitrofurans Action: bind ribosomal proteins	• Gram pos+ and gram neg- causing UTIs	**nitrofurantoin**	MacroBID, generic
Nitromidazoles Action: disrupt cell DNA	• Various anaerobic bacteria including *C. difficile*	**metronidazole**	Flagyl, generic
Ansamycins Action: interfere with nucleic acid synthesis	• Tuberculosis and leprosy	**rifabutin** **rifampin**	Mycobutin Rifadin, Rofact, Rifater
Oxazolidonones Action: inhibit protein synthesis	• Serious infections caused by resistant strains of gram pos+ bacteria	**linezolid**	Zyvoxam

Proton Pump Inhibitors reduce the production of gastric acid by blocking the enzyme in the wall of the stomach that produces acid. The reduction of acid is useful in the prevention and treatment of: ulcers, gastroesophageal reflux disease (GERD), Zollinger-Ellison syndrome and, in combination with antibiotics, to eradicate Helicobacter pylori.

Available proton pump inhibitors include:

- omeprazole (**Losec, generic brands**)
- lansoprazole (**Prevacid, generic brands**)
- rabeprazole (**Pariet, generic brands**)
- pantoprazole (**Pantaloc, Tecta, generic brands**)
- esomeprazole (**Nexium, generic brands**)

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