**Appendices:** **Characteristics of Drug Poisonings Presenting to the Emergency Department of an Urban Hospital**

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# **Appendix A: Coding Algorithm**

This study utilized ICD-10 coding for its population identification and parts of the data collection.

* At \*\*\*, like other Canadian hospitals, ICD-10 codes are applied for each admission to patients’ discharge summaries in accordance with the Canadian Coding Standards and CIHI standard procedures.
* Each drug poisoning is coded with the drug(s) (Appendix D- Table 5), the manifestation of the drug poisoning, the intent of the drug poisoning (Appendix D- Table 4) and the location it occurred.

Figure 1**:** Drug Poisoning Coding Pathway as per Canadian Coding Standards1,12,13

![Diagram

Description automatically generated]()

# 

# **Appendix B: Data Collection Process**

## Figure 2: Data collection process

Identification of Study Population

Health Information Management generated a report identifying all patients seen in the ED/UC with a drug poisoning using ICD-10-CA coding (Appendix D Tables 4&5) meeting the inclusion criteria. The exclusion criteria were then applied to the initial cohort. The initial report generated contained additional information with the coding, including the demographics, providers involved in care, discharge location, length of stay, and special care admissions (Appendix C: Table 1).

ICD-10-CA Codes (Appendix D Tables 4&5) to be included in each poisoning chart as per the Canadian Coding Standards by the Canadian Institute of Health Information

Poisoning Code: Drug, Medication, or biologic substance cause of poisoning

Occurrence: Location of poisoning

Manifestation Code: The resulting signs, symptoms and disease states

External Cause Code: Intentional, accidental or unknown intention of poisoning

Additional Data Generation by the Analytics Department

A second report was generated by the Analytics department using the EMRs from the identified poisoning patients’ visits in the previous step. This report included selected patient comorbidities and ordered antidotes, referrals, and laboratory drug levels (Appendix C: Table 1).

Review of Collected Information

The two generated reports were merged into a single document with data organized by patient medical record number. The investigators then reviewed the records to ensure inclusion and exclusion criteria were appropriately met.

Deidentification of Data

A unique four-digit numeric code (i.e. study ID) was assigned to each case once screening was complete in place of their medical record number. If a patient was seen multiple times during the study period for a poisoning (i.e. the same MRN appears multiple times in the generated report), the same study ID was assigned with an additional alphanumeric character to reflect each unique admission.

The document linking the study ID with the medical record number was stored on the secure \*\*\* server.

**Figure 1:** Data collection process

# **Appendix C: Variable Collection**

## Table 1: Variables Collected and their respective retrieval location

|  |  |  |  |
| --- | --- | --- | --- |
|  | Variable | Description | Location of Data |
| Poisoning | Intention | ICD-10-CA Coding (Appendix D, Table 4) | CIHI |
| Drug Involved | ICD-10-CA Coding (Appendix D, Table 5) |
| In-hospital Management | Antidotes Ordered | Ontario Poison Control recommended antidotes and activated charcoal (Appendix C, Table 2) | EMR |
| Team Referrals Ordered | Teams referred to assist in care  (Appendix C, Table 3) |
| Urine and Blood Drug Levels | Toxicology levels ordered during admission (Appendix C, Table 3) |
| Providers Specialities Involved in Care | Medical specialities/disciplines of Providers |
| In-hospital Outcomes | Length of Stay | Time from presentation at ED to discharge from acute medical unit (days) | CIHI |
| Admission to Special Care Units | Admission to an intensive care unit, medical step-down unit, or combination of such (Appendix E, 12) |
| Discharge Location | Discharge location from ED or acute medical unit (Appendix E, Table 8&9). |
| Demographics | Age | Years | CIHI |
| Gender | Female, Male, Non-binary |
| Forward Sortation Area | First 3 characters of a postal code |
| Comorbidities | Medical Conditions of Interest (Appendix C, Table 3) | EMR |

## Table 2: Antidotes Stocked at \*\*\* as per OPC Guidance

|  |  |  |  |
| --- | --- | --- | --- |
| **Antidote** | **Strength** | **Route** | **Indication** |
| Acetylcysteine (Mucomyst) | 200 mg/mL | IV | Acetaminophen and other hepatotoxins |
| Atropine sulfate | 0.6 mg/mL | IV/IM | Carbamate and organophosphate insecticides |
| Botulism A-G Heptavalent Antitoxin | 18 mL | IV | Botulism Toxin |
| Bromocriptine | 2.5 mg | Oral | Neuroleptic malignant syndrome |
| Calcium chloride | 1g/10 mL Syringe | IV | Calcium channel blockers, hydrofluoric acid burns |
| Calcium gluconate | 1g/10mL (10%) | IV | Calcium channel blockers, hydrofluoric acid burns |
| Calcium gluconate | 2.5% gel | Topical |  |
| Cyproheptadine (Periactin) | 4 mg | Oral | Serotonin Syndrome |
| Dantrolene | 20 mg injection | IV | Malignant hyperthermia, neuroleptic malignant syndrome |
| Deferoxamine mesylate (Desferal) | 2 g injection | IV/IM | Iron |
| Dextrose | 25 g/ 50 mL | IV | Insulin, sulfonylureas, with insulin for BB, CCB |
| Digoxin immune fab (Digifab/Digibind) | 40 mg vial | IV | Digoxin and other cardiac glycosides |
| Dimercaprol (BAL) | 100 mg/mL (3 mL) | IM | Acute arsenic, inorganic mercury, lead |
| Esmolol | 10 mg/mL | IV |  |
| Ethyl alcohol | 100 % (dehydrated) | IV | Methanol, ethylene glycol, or diethylene glycol |
| Flumazenil | 0.1 mg/mL injection (5mL) | IV | Benzodiazepines |
| Folic acid | 5 mg/mL injection | IV | Formaldehyde, methanol, methotrexate, trimethoprim |
| Fomepizole | 1 mg/mL injection (1.5 mL) | IV | Methanol, ethylene glycol |
| Glucagon | 1 mg vial | IM/IV | Beta-blockers |
| Hydroxocobalamin (Cyanokit) | 5 g/vial | IV | Cyanide |
| Idarucizumab (Praxbind) | 2.5 g/50 mL injection | IV | Dabigatran |
| Insulin (regular) | 100 units/mL | IV | Beta-blockers, calcium channel blockers |
| Labetalol | 5 mg/mL injection | IV |  |
| L-Carnitine | 200 mg/mL injection | IV | Hyperammonemia or valproic acid |
| Leucovorin | 50 mg/mL injection | IV | Formaldehyde, methanol, methotrexate, trimethoprim |
| Lipid 20% (Intralipid) | 1 L | IV | Lipid soluble toxin |
| Methylene Blue | 10 mg/mL | IV | Methemoglobinemia |
| Midazolam | 1 mg/mL injection  5 mg/mL injection | IM/IV |  |
| Naloxone (Narcan) | 0.4 mg/mL injection | IM/IV | Opioids |
| Octreotide (Sandostatin) | 500 mcg/mL injection | IV | Sulfonylureas, repaglinide and related drugs |
| Phentolamine | 5 mg/mL | IV | Dopamine, epinephrine, norepinephrine and phenylephrine |
| Physostigmine salicylate | 1 mg/mL injection | IM/IV | Anticholinergic syndrome |
| Phytonadione (Vitamin K) | 10 mg/mL injection | IV | Warfarin |
| Pralidoxime (2PAM) | 1 g injection | IV/IM | Organophosphate insecticides |
| Prothrombin Complex Concentrate (Octaplex) |  | IV | Warfarin |
| Pyridoxine (Vit B6) | 100 mg/mL injection | IM/IV | Isoniazid (INH), ethylene glycol (cofactor) |
| Sodium Bicarbonate | 1 mEq/mL injection | IV | Tricyclic antidepressants (bolus), cocaine (bolus), salicylates (infusion) |
| Sodium thiosulfate | 25% injection | IV | Cyanide |
| Thiamine (Vitamin B1) | 100 mg/mL injection | IM/IV | Ethanol, ethylene glycol |
| Tranexamic Acid | 100 mg/mL injection | IV |  |
|  |  |  |  |
| Additional Agent Used in Poisonings not on the Recommended OPC Antidote List | | | |
| Activated Charcoal | 50g /225 mL | PO | Adsorbent |

\*Protamine is not listed on antidote list but carried in pharmacy

\*\*Dimoval to replace Dimercaprol on formulary due to drug shortages, but for the study period, Dimercaprol was available.

## Table 3: Selected consults, labs and comorbidities that can be ordered/documented in EPIC® relating to acute drug poisonings and mental health

|  |  |  |
| --- | --- | --- |
| **Consults** | **Labs** | **Comorbidities6-8** |
| Concurrent capacity building team inpatient consult | Drug Screen Panel (emergency) | Major Depressive Disorder |
| Psychiatric emergency services (PES) consult | Drug Screen Faeces | Generalized Anxiety Disorder |
| Psychologist consult | Drug Screen, hair | Agoraphobia |
| Consultation liaison psychiatry services inpatient consult | Drug Screen, Urine | Obsessive-compulsive disorder |
| Behavioral therapy consults | POCT rapid urine drug panel | Post-traumatic Stress Disorder |
| Consult to mood disorders tertiary mental health | Barbiturate Screen | Schizophrenia |
| Consult to Schizophrenia tertiary mental health | Phenothiazine Screen, urine | Schizoaffective Disorder |
| Social Work inpatient consult | Drug Levels:   * Acetaminophen level * Alcohols and ethylene glycol * Amiodarone level * Amitriptyline level * Benzodiazepine, urine, quantitative * Carbamazepine level, total * Clonazepam level * Cocaine, urine, qualitative * Cyclosporine level * Dabigatran level * Digoxin level * Doxepin level * Ethanol * Ethanol, urine * Fentanyl, urine * Gabapentin level * Haloperidol level * Imipramine level * Lamotrigine level * Lidocaine level * Lithium level * Methotrexate level * Nortriptyline level * Opiate, urine, qualitative * Phenobarbital level * Phencyclidine (PCP), urine * Phenytoin level * Primidone level * Salicylate level * Sirolimus level * Tacrolimus level * Theophylline level * Topiramate level * Valproic acid level | Bipolar Disorder Type 1 |
| Inpatient consult to clinical pharmacology and toxicology | Protime-INR | Bipolar Disorder Type 2 |
| Integrated Comprehensive care (ICC) inpatient consult | XA Heparin standard | Borderline Personality Disorder |
| Factor 10 activity | Antisocial personality disorder |
| Attention Deficit Hyperactivity Disorder |
| Eating Disorder |
| Opioid Use Disorder |
| Cannabis Use Disorder |
| Alcohol Use Disorder |
| Substance Use Disorder |
| Chronic Pain |
| Human Immunodeficiency Virus |
| Cancer |
| Cardiovascular Disease (HF, MI, Stroke, PVD) |
| Diabetes (T1DM and T2DM) |
| COPD |
|  |  | Dementia |

# **Appendix D: ICD-10 Codes**

The following tables outline the ICD-10 codes with their corresponding description used in this study1.

## Table 4: ICD-10 Drug Poisoning Codes for external causes of morbidity and mortality by drug or substance (Accidental=X40-44, Intentional=X60-X64, and unknown intent=Y10-Y14)

|  |  |  |
| --- | --- | --- |
| **Accidental Poisoning by and exposure to noxious substances** | | |
| **Medication Class** | **Code** | **Examples** |
| Nonopioid analgesics, antipyretics and antirheumatics | X40 | 4-aminophenol derivatives |
| Nonsteroidal anti-inflammatory drugs [NSAID] |
| Pyrazolone derivatives |
| Salicylate |
| Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified | X41 | Antidepressants |
| Barbiturates |
| Hydantoin derivatives |
| Iminostilbenes |
| Methaqualone compounds |
| Neuroleptics |
| Psychostimulants |
| Succinimides and oxazolidinediones |
| Tranquillizer |
| Narcotics and psychodysleptics [hallucinogens], not elsewhere classified | X42 | Cannabis (derivatives) |
| Cocaine |
| Codeine |
| Heroin |
| Lysergide [LSD] |
| Mescaline |
| Methadone |
| Morphine |
| Opium (alkaloids) |
| Drugs acting on the autonomic nervous system | X43 | Parasympatholytics [anticholinergics and antimuscarinics] and spasmolytics |
| Parasympathomimetics [cholinergics] |
| Sympatholytics [antiadrenergics] |
| Sympathomimetics [adrenergics] |
| Other and unspecified drugs, medicaments and biological substance | X44 | Agents primarily acting on smooth and skeletal muscles and the respiratory system |
| Anaesthetics (general)(local) |
| Drugs affecting the:  -cardiovascular system  - gastrointestinal system |
| Hormones and synthetic substitutes |
| Systemic and haematological agents |
| Systemic antibiotics and other anti-infectives |
| Therapeutic gases |
| Topical preparations |
| Vaccines |
| Water-balance agents and drugs affecting mineral and uric acid metabolism |
| **Intentional Self-Poisoning by and exposure to noxious substances** | | |
| Nonopioid analgesics, antipyretics and antirheumatics | X60 | 4-aminophenol derivatives |
| Nonsteroidal anti-inflammatory drugs [NSAID] |
| Pyrazolines derivatives |
| Salicylate |
| Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified | X61 | Antidepressants |
| Barbiturates |
| Hydantoin derivatives |
| Iminostilbenes |
| Methaqualone compounds |
| Neuroleptics |
| Psychostimulants |
| Succinimides and oxazolidinediones |
| Tranquillizer |
| Narcotics and psychodysleptics [hallucinogens], not elsewhere classified | X62 | Cannabis (derivatives) |
| Cocaine |
| Codeine |
| Heroin |
| Lysergide [LSD] |
| Mescaline |
| Methadone |
| Morphine |
| Opium (alkaloids) |
| Drugs acting on the autonomic nervous system | X63 | Parasympatholytics [anticholinergics and antimuscarinics] and spasmolytics |
| Parasympathomimetics [cholinergics] |
| Sympatholytics [antiadrenergics] |
| Sympathomimetics [adrenergics] |
| Other and unspecified drugs, medicaments and biological substance | X64 | Agents primarily acting on smooth and skeletal muscles and the respiratory system |
| Anaesthetics (general)(local) |
| Drugs affecting the:  -cardiovascular system  - gastrointestinal system |
| Hormones and synthetic substitutes |
| Systemic and haematological agents |
| Systemic antibiotics and other anti-infectives |
| Therapeutic gases |
| Topical preparations |
| Vaccines |
| Water-balance agents and drugs affecting mineral and uric acid metabolism |
| **Unknown Intent of Poisoning by and exposure to noxious substances** | | |
| Nonopioid analgesics, antipyretics and antirheumatics | Y10 | 4-aminophenol derivatives |
| Nonsteroidal anti-inflammatory drugs [NSAID] |
| Pyrazolines derivatives |
| Salicylate |
| Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified | Y11 | Antidepressants |
| Barbiturates |
| Hydantoin derivatives |
| Iminostilbenes |
| Methaqualone compounds |
| Neuroleptics |
| Psychostimulants |
| Succinimides and oxazolidinediones |
| Tranquillizer |
| Narcotics and psychodysleptics [hallucinogens], not elsewhere classified | Y12 | Cannabis (derivatives) |
| Cocaine |
| Codeine |
| Heroin |
| Lysergide [LSD] |
| Mescaline |
| Methadone |
| Morphine |
| Opium (alkaloids) |
| Drugs acting on the autonomic nervous system | Y13 | Parasympatholytics [anticholinergics and antimuscarinics] and spasmolytics |
| Parasympathomimetics [cholinergics] |
| Sympatholytics [antiadrenergics] |
| Sympathomimetics [adrenergics] |
| Other and unspecified drugs, medicaments and biological substance | Y14 | Agents primarily acting on smooth and skeletal muscles and the respiratory system |
| Anaesthetics (general)(local) |
| Drugs affecting the:  -cardiovascular system  - gastrointestinal system |
| Hormones and synthetic substitutes |
| Systemic and haematological agents |
| Systemic antibiotics and other anti-infectives |
| Therapeutic gases |
| Topical preparations |
| Vaccines |
| Water-balance agents and drugs affecting mineral and uric acid metabolism |

## Table 5: ICD-10 Poisoning Codes by drugs, medicaments, and biological Substances (T36-T50)1

|  |  |  |
| --- | --- | --- |
| **Drug Class (code)** | **Code** | **Family Medication Class** |
| Systemic Antibiotics (T36) | T36.0 | Penicillins |
| T36.1 | Cephalosporins and other beta-lactam antibiotics |
| T36.2 | Chloramphenicol group |
| T36.3 | Macrolides |
| T36.4 | Tetracyclines |
| T36.5 | Aminoglycosides |
| T36.6 | Rifamycins |
| T36.7 | Antifungal antibiotics, systemically used |
| T36.8 | Other systemic antibiotics |
| T36.9 | Systemic antibiotic, unspecified |
| Other systemic anti-infectives and anti-parasitics (T37) | T37.0 | Sulfonamides |
| T37.1 | Antimycobacterial drugs |
| T37.2 | Antimalarials and drugs acting on other blood protozoa |
| T37.3 | Other antiprotozoal drugs |
| T37.4 | Anthelminthics |
| T37.5 | Antiviral drugs |
| T37.8 | Other specified systemic anti-infectives and antiparasitics |
| T37.9 | Systemic anti-infectives and antiparasitics, unspecified |
| Hormones and their synthetic substitutes and antagonists, not elsewhere classified (T38) | T38.0 | Glucocorticoids and synthetic analogues |
| T38.1 | Thyroid hormones and substitutes |
| T38.2 | Thyroid hormones and substitutes |
| T38.3 | Thyroid hormones and substitutes |
| T38.4 | Oral contraceptives |
| T38.5 | Other estrogens and progestogens |
| T38.6 | Antigonadotropins, antiestrogens and antiandrogens not elsewhere classified |
| T38.7 | Androgens and anabolic congeners |
| T38.8 | Other and unspecified hormones and their synthetic substitutes |
| T38.9 | Other and unspecified hormone antagonists |
| Nonopioid analgesics, antipyretics and antirheumatics (T39) | T39.0 | Salicylates |
| T39.1 | 4-Aminophenol derivatives |
| T39.2 | Pyrazoline derivatives |
| T39.3 | Other Non-steroidal anti-inflammatory drugs (NSAIDs) |
| T39.4 | Antirheumatics, not elsewhere classified |
| T39.8 | Other nonopioid analgesics and antipyretics not elsewhere classified |
| T39.9 | Nonopioid analgesics, antipyretics and antirheumatics, unspecified |
| Narcotics and pyschodysleptics (T40) | T40.0 | Opium |
| T40.1 | Heroin |
| T40.2 | Other opioids  -codeine  -morphine |
| T40.3 | Methadone |
| T40.4 | Other synthetic narcotics |
| T40.5 | Cocaine |
| T40.6 | Other and unspecified narcotics |
| T40.7 | Cannabis (derivatives) |
| T40.8 | Lysergide (LSD) |
| T40.9 | Other and unspecified pyschodysleptics (hallucinogens) (  -Mescaline  -Psilocin  -Psilocybin |
| Anaesthetics and therapeutic gases (T41) | T41.0 | Inhaled anesthetics |
| T41.1 | Intravenous anesthetics |
| T41.2 | Other and unspecified general anesthetics |
| T41.3 | Local anesthetics |
| T41.4 | Anesthetics, unspecified |
| T41.5 | Therapeutic gases  -carbon dioxide  -oxygen |
| Antiepileptic, sedative-hypnotic and antiparkinsonism drugs | T42.0 | Hydantoin derivatives |
| T42.1 | Iminostilbenes  -carbamazepine |
| T42.2 | Succinimides and oxazolidinediones |
| T42.3 | Barbiturates |
| T42.4 | Benzodiazepines |
| T42.5 | Mixed antiepileptics not classified elsewhere |
| T42.6 | Other antiepileptic and sedative-hypnotic drugs  -valproic acid  -methaqualone |
| T42.7 | Antiepileptic and sedative hypnotic drugs, unspecified |
| T42.8 | Antiparkinsonism drugs and other central muscle tone depressants  -amantadine |
| Psychotropic drugs, not classified elsewhere (T43) | T43.0 | Tricyclic and tetracyclic antidepressants |
| T43.1 | Monoamine-oxidase inhibitor antidepressants |
| T43.2 | Other and unspecified antidepressants |
| T43.3 | Phenothiazine antipsychotics and neuroleptics |
| T43.4 | Butyrophenone and thioxanthene neuroleptics |
| T43.5 | Other and unspecified antipsychotics and neuroleptics |
| T43.6 | Psychostimulants with abuse potential |
| T43.8 | Other psychotropic drugs, not elsewhere classified |
| 43.9 | Psychotropic drug, unspecified |
| Drugs primarily affecting the autonomic nervous system (T44) | T44.0 | Anticholinesterase agents |
| T44.1 | Other parasympathomimetics (cholinergics) |
| T44.2 | Ganglionic blocking drugs, not elsewhere classified |
| T44.3 | Other parasympatholytics and spasmolytics not elsewhere classified  -Papaverine |
| T44.4 | Predominately alpha-adrenoreceptor agonists, not elsewhere classified |
| T44.5 | Predominately beta-adrenoreceptor agonists, not elsewhere classified |
| T44.6 | Alpha-adrenoreceptor antagonists, not elsewhere classified  -ergot alkaloids |
| T44.7 | Beta-adrenoreceptor antagonists, not elsewhere classified |
| T44.8 | Centrally acting and adrenergic-neuron-blocking agents, not elsewhere classified |
| T44.9 | Other and unspecified drugs primarily affecting the autonomic nervous system  -drug stimulating both alpha and beta adrenoreceptors |
| Primarily systemic and hematological agents, not elsewhere classified (T45) | T45.0 | Antiallergic and antiemetic drugs |
| T45.1 | Antineoplastic and immunosuppressive drugs  -antineoplastic antibiotics  -Cytarabine |
| T45.2 | Vitamins not elsewhere classified |
| T45.3 | Enzymes, not elsewhere classified |
| T45.4 | Iron and its compounds |
| T45.5 | Anticoagulants |
| T45.6 | Fibrinolysis-affecting drugs |
| T45.7 | Anticoagulant antagonists, vitamin k and other coagulants |
| T45.8 | Other primarily systemic and haematological agents  -liver preparations and other antianaemic agents  -Natural blood products  -Plasma substitute |
| T45.9 | Primarily systemic and haematological agents, unspecified |
| Agents affecting the cardiovascular system (T46) | T46.0 | Cardiac stimulant glycosides and drugs of similar action |
| T46.1 | Calcium channel blockers |
| 46.2 | Other antidysrhythmic drugs not elsewhere classified |
| T46.3 | Coronary vasodilators, not elsewhere classified  -dipyridamole |
| T46.4 | Angiotensin converting enzyme inhibitors |
| T46.5 | Other antihypertensive drugs, not classified elsewhere  -clonidine |
| T46.6 | Antihyperlipidaemic and antiarteriosclerotic drugs |
| T46.7 | Peripheral vasodilators |
| T46.8 | Antivaricose drugs, including sclerosing agents |
| T46.9 | Other and unspecified agents primarily affecting the cardiovascular system |
| Primarily affecting the gastrointestinal system (T47) | T47.0 | Histamine H2 Receptor Antagonists |
| T47.1 | Other antacids and anti-gastric secretion drugs |
| T47.2 | Stimulant laxatives |
| T47.3 | Saline and osmotic laxatives |
| T47.4 | Other laxatives |
| T47.5 | Digestants |
| T47.6 | Antidiarrheal drugs |
| T47.7 | Emetics |
| T47.8 | Other agents primarily affecting the gastrointestinal system |
| T47.9 | Agent primarily affecting the gastrointestinal systemic, unspecified |
| Primarily acting on smooth and skeletal muscles and the respiratory system (T48) | T48.0 | Oxytocic drugs |
| T48.1 | Skeletal muscle relaxants [neuromuscular blocking agents] |
| T48.2 | Other and unspecified agents primarily acting on muscles |
| T48.3 | Antitussives |
| T48.4 | Expectorants |
| T48.5 | Anti-common cold drugs |
| T48.6 | Antiasthmatics, not elsewhere classified  -Salbutamol |
| T48.7 | Other and unspecified agents primarily acting on the respiratory system |
| Topical agents primarily affecting skin and mucous membranes and by Ophthalmological, otorhinolaryngological and dental drugs (T49) | T49.0 | Local antifungal, anti-infective and anti-inflammatory drugs, not elsewhere classified |
| T49.1 | Antipruritics |
| T49.2 | Local astringents and local detergents |
| T49.3 | Emollients, demulcents and protectants |
| T49.4 | Keratolytics, keratoplasties and other hair treatment drugs and preparations |
| T49.5 | Ophthalmological drugs and preparations  -eye anti-infectives |
| T49.6 | Otorhinolaryngological drugs and preparations  -ear, nose and throat anti-infectives |
| T49.7 | Dental drugs, topically applied |
| T49.8 | Other topical agents  -spermicides |
| T49.9 | Topical agent, unspecified |
| Diuretics and other unspecified drugs, medicaments and biological substances (T50) | T50.0 | Mineralocorticoids and their antagonists |
| T50.1 | Loop diuretics |
| T50.2 | Carbonic-anhydrase inhibitors, benzothiadiazides and other diuretics  -acetazolamide |
| T50.3 | Electrolytic, caloric and water balance agents  -oral rehydration salts |
| T50.4 | Drugs affecting uric acid metabolism |
| T50.5 | Appetite depressants |
| T50.6 | Antidotes and chelating agents, not classified elsewhere  -Alcohol deterrents |
| T50.7 | Analeptics and opioid receptor antagonists |
| T50.8 | Diagnostic agents |
| T50.9 | Other unspecified drugs, medicaments and biological substances  -acidifying agents  -alkalizing agents  -immunoglobulins  -immunologicals  -lipotropic drugs  -parathyroid hormones and derivatives |

# **Appendix E: Grouping of Data**

## Table 6: Grouping of Intention Codes1

|  |  |  |
| --- | --- | --- |
| ICD-10 Code | Details | Study Grouping |
| X40 | Non-Intentional: Nonopioid analgesics, antipyretics and antirheumatics (NSAIDs, acetaminophen, salicylate, etc.) | Non-intentional Poisoning |
| X41 | Non-Intentional: Antiepileptic, sedative, hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified (antidepressants, neuroepileptics, tranquilizers, stimulants, etc.) |
| X42 | Non-Intentional: Narcotics and psychodysleptics (Cannabis, opioids’, cocaine, heroin, LSD, methadone, etc.) [hallucinogens], not elsewhere classified |
| X43 | Non-Intentional: Drugs acting on the autonomic nervous system (Parasympathomimetics, Sympatholytics, etc.) |
| X44 | Non-Intentional: Other and unspecified drugs, medicaments and biological substance (Cardio, hormones, anaesthetics, GI, etc.) |
| X60 | Intentional: Nonopioid analgesics, antipyretics and antirheumatics (NSAIDs, acetaminophen, salicylate, etc.) | Intentional Poisoning |
| X61 | Intentional: Antiepileptic, sedative hypnotic antiparkinsonism and psychotropic drugs, not elsewhere classified (antidepressants, neuroepileptics, tranquilizers, stimulants, etc.) |
| X62 | Intentional: Narcotics and psychodysleptics (Cannabis, opioids, cocaine, heroin, LSD, methadone, etc.) [hallucinogens], not elsewhere classified |
| X63 | Intentional: Drugs acting on the autonomic nervous system (Parasympathomimetics, Sympatholytics, etc.) |
| X64 | Intentional: Other and unspecified drugs, medicaments and biological substance (Cardio, hormones, anaesthetics, GI, etc.) |
| Y10 | Unknown: Nonopioid analgesics, antipyretics and antirheumatics (NSAIDs, acetaminophen, salicylate, etc.) | Unknown Intent of Poisoning |
| Y11 | Unknown: Antiepileptic, sedative hypnotic antiparkinsonism and psychotropic drugs, not elsewhere classified (antidepressants, neuroepileptics, tranquilizers, stimulants, etc.) |
| Y12 | Unknown: Narcotics and psychodysleptics (Cannabis, opioids, cocaine, heroin, LSD, methadone, etc.) [hallucinogens], not elsewhere classified |
| Y13 | Unknown: Drugs acting on the autonomic nervous system (Parasympathomimetics, Sympatholytics, etc.) |
| Y14 | Unknown: Other and unspecified drugs, medicaments and biological substance (Cardio, hormones, anaesthetics, GI, etc.) |

## Table 7: Grouping of Poison Codes1

|  |  |  |
| --- | --- | --- |
| **ICD-10 Code** | **Details** | **Grouping** |
| 36,0 | Penicillins | Antimicrobials |
| 36.1 | Cephalosporins |
| 36.3 | Macrolides |
| 36.4 | Tetracyclines |
| 36.9 | Systemic antibiotic, unspecified |
| 37.2 | Antimalarials and drugs acting on other blood protozoa |
| 37.5 | Antiviral drugs |
| 37.8 | Other specified systemic anti-infectives and antiparasitics |
| 38,0 | Glucocorticoids and synthetic analogues | Hormones |
| 38.1 | Thyroid hormones and substitutes |
| 38.3 | Insulin and oral hypoglycemic [antidiabetic] drugs |
| 38.4 | Oral contraceptives |
| 38.5 | Other estrogens and progestogens |
| 38.8 | Other and unspecified hormones and their synthetic substitutes |
| 39,0 | Salicylates | Salicylates |
| 39.1 | 4-Aminophenol derivatives | Acetaminophen |
| 39.2 | Pyrazoline derivatives | NSAIDs |
| 39.3 | Other Non-steroidal anti-inflammatory drugs (NSAIDs) |
| 39.4 | Antirheumatics, not elsewhere classified | Other analgesics |
| 39.8 | Other nonopioid analgesics and antipyretics not elsewhere classified |
| 39.9 | Nonopioid analgesics, antipyretics and antirheumatics, unspecified |
| 40,0 | Opium | Other Opioids |
| 40.2 | Other opioids not specified elsewhere |
| 40.28 | Other opioid |
| 40.41 | Tramadol |
| 40.48 | Other synthetic opioid |
| 40.1 | Heroin | Heroin |
| 40.,20 | Codeine | Prescription Opioids Excluding Fentanyl + Methadone |
| 40.21 | Morphine |
| 40.22 | Hydromorphone |
| 40.23 | Oxycodone |
| 40.3 | Methadone | Methadone |
| 40,40 | fentanyl | Fentanyl |
| 40.5 | Cocaine | Cocaine |
| 40.7 | Cannabis (derivatives) | Cannabis |
| 40.6 | Other and unspecified narcotics | Psychedelics |
| 40.8 | Lysergide (LSD) |
| 40.9 | Other and unspecified psychedelics (hallucinogens) (Mescaline, psilocin) |
| 41.2 | Other and unspecified general anesthetics | Anesthetics |
| 41.3 | Local anesthetics |
| 42,0 | Hydantoin derivatives | Antiepileptics |
| 42.1 | Iminostilbenes (carbamazepine) |
| 42.2 | Succinimides and oxazolidinediones |
| 42.3 | Barbiturates |
| 42.5 | Mixed antiepileptics not classified elsewhere |
| 42.6 | Other antiepileptic and sedative-hypnotic drugs (valproic acid) |
| 42.7 | Antiepileptic and sedative hypnotic drugs, unspecified |
| 42.4 | Benzodiazepines | Benzodiazepines |
| 42.8 | Antiparkinsonism drugs and other central muscle tone depressants (amantadine) | Antiparkinsonisms |
| 43,0 | Tricyclic and tetracyclic antidepressants | Tricyclic Antidepressants |
| 43.1 | Monoamine-oxidase inhibitor antidepressants | Other Antidepressants |
| 43.2 | Other and unspecified antidepressants |
| 43.3 | Phenothiazine antipsychotics and neuroleptics |
| 43.4 | Butyrophenone and thioxanthene neuroleptics | Antipsychotics |
| 43.5 | Other and unspecified antipsychotics and neuroleptics |
| 43.6 | Psychostimulants with abuse potential | Other Psychostimulants |
| 43.8 | Other psychotropic drugs, not elsewhere classified | Other Psychotropics |
| 43.9 | Psychotropic drug, unspecified |
| 44.0 | Anticholinesterase agents | Drugs Acting on Autonomic Nervous System |
| 44.1 | Other parasympathomimetics (cholinergics) |
| 44.2 | Ganglionic blocking drugs, not elsewhere classified |
| 44.3 | Other parasympatholytics and spasmolytics not elsewhere classified (papaverine) |
| 44.4 | Predominately alpha-adrenoreceptor agonists, not elsewhere classified |
| 44.5 | Predominately beta-adrenoreceptor agonists, not elsewhere classified |
| 44.6 | Alpha-adrenoreceptor antagonists, not elsewhere classified (ergots) |
| 44.7 | Beta-adrenoreceptor antagonists, not elsewhere classified |
| 44.8 | Centrally acting and adrenergic-neuron-blocking agents, not elsewhere classified |
| 44.9 | Other and unspecified drugs primarily affecting the autonomic nervous system (stimulate both alpha and beta) |
| T45.0 | Antiallergic and antiemetic drugs | Antiemetics and Antiallergics |
| T45.1 | Antineoplastic and immunosuppressive drugs (antineoplastic, cytarabine) | Hematological Agents |
| T45.2 | Vitamins not elsewhere classified |
| T45.3 | Enzymes, not elsewhere classified |
| T45.4 | Iron and its compounds |
| T45.5 | Anticoagulants |
| T45.6 | Fibrinolysis-affecting drugs |
| T45.7 | Anticoagulant antagonists, vitamin k and other coagulants |
| T45.8 | Other primarily systemic and haematological agents (natural blood products, plasma substitute, liver preparations) |
| T45.9 | Primarily systemic and haematological agents, unspecified |
| 46,0 | Cardiac stimulant glycosides and drugs of similar action | Cardiovascular Drugs |
| 46.1 | Calcium channel blockers |
| 46.2 | Other antidysrhythmic drugs not elsewhere classified |
| 46.3 | Coronary vasodilators, not elsewhere classified (dipyridamole) |
| 46.4 | Angiotensin converting enzyme inhibitors |
| 46.5 | Other antihypertensive drugs, not classified elsewhere (clonidine) |
| 46.6 | Antihyperlipidemics and antiarteriosclerotic drugs |
| 46.7 | Peripheral vasodilators |
| 46.8 | Antivaricose drugs, including sclerosing agents |
| 46.9 | Other and unspecified agents primarily affecting the cardiovascular system |
| 47,0 | Histamine H2 Receptor Antagonists | Gastrointestinal Drugs |
| 47.1 | Other antacids and anti-gastric secretion drugs |
| 47.2 | Stimulant laxatives |
| 47.4 | Other laxatives |
| 47.5 | Digestants |
| 47.6 | Antidiarrheal drugs |
| 47.7 | Emetics |
| 47.8 | Other agents primarily affecting the gastrointestinal system |
| 48,0 | Oxytocic drugs | Drugs affecting Smooth Muscle |
| 48.1 | Skeletal muscle relaxants [neuromuscular blocking agents] |
| 48.2 | Other and unspecified agents primarily acting on muscles |
| 48.3 | Antitussives |
| 48.4 | Expectorants |
| 48.5 | Anti-common cold drugs |
| 48.6 | Antiasthmatics, not elsewhere classified (Salbutamol) |
| 48.7 | Other and unspecified agents primarily acting on the respiratory system |
| 49,0 | Local antifungal, anti-infective and anti-inflammatory drugs, not elsewhere classified | Topical Drugs |
| 49.2 | Local astringents and local detergents |
| 49.4 | Keratolytics, keratoplasties and other hair treatment drugs and preparations |
| 49.6 | Otorhinolaryngological drugs and preparations  -ear, nose and throat anti-infectives |
| 49.7 | Dental drugs, topically applied |
| T50.0 | Mineralocorticoids and their antagonists | Diuretics |
| T50.1 | Loop diuretics |
| T50.2 | Carbonic-anhydrase inhibitors, benzothiadiazides and other diuretics |
| T50.3 | Electrolytic, caloric and water balance agents | Other Agents |
| T50.4 | Drugs affecting uric acid metabolism |
| T50.5 | Appetite depressants |
| T50.6 | Antidotes and chelating agents, not classified elsewhere |
| T50.7 | Analeptics and opioid receptor antagonists |
| T50.8 | Diagnostic agents |
| T50.9 | Other unspecified drugs, medicaments and biological substances (acidifying agents, immunoglobulins, immunologicals, lipotropic, PTH) |

## Table 8: Grouping of Discharge Locations from ER1

|  |  |  |
| --- | --- | --- |
| **NACR** | | |
| **ICD-10 Code** | **Description** | **Grouping** |
| 10 | Death after arrival | Died |
| 72 | Died in facility - Excludes MAID and in facility suicide |
| 3 | Left AMA after triage & registration | Left Against Medical Advice |
| 4 | Left AMA after triage & registration & assessment |
| 5 | Left AMA after triage & registration & assessment & treatment |
| 62 | Leave post initial treatment - patient left following registration, further assessment by a service provider and initiation of treatment |
| 63 | Left after triage- patient left the ED at his/her own risk following registration and triage |
| 64 | Left after initial assessment- patient left after registration, triage and further assessment (initial treatment did not occur) |
| 1 | Discharged home, no support services(private dwelling) | Home (with or without support, correctional facility, transitional home, etc.) |
| 15 | Discharged to place of residence |
| 16 | Home WITH Support/Referral- Discharged to private home with supports from the community at home or referred services |
| 17 | Home WITHOUT Support/Referral- Discharged to private home without supports from the community at home or referred services |
| 40 | Group/Supportive Living- Transfer to assisted living/supportive housing or transitional housing, including shelters, do not have 24-hour nursing care |
| 90 | Correctional Facility- Transfer to jail or halfway house |
| 6 | Admit to reporting facility as inpatient to SCU or Ambulatory care visit functional centre | Transfer to another acute care locations within hospital or between hospitals (can include Mental Health) |
| 7 | Admit to reporting facility as inpatient to another unit of the reporting facility from the ambulatory care visit functional centre |
| 8 | Transfer to another acute care facility directly from ambulatory care visit functional centre (includes transfer to another acute care facility with entry through the ED) |
| 12 | Transfer to surgery |
| 9 | Transfer to another non-acute care facility directly from ambulatory care functional centre (stand-alone rehab, mental health) | Transfer to non-acute care facilities; LTC, Mental health or Addiction Facilities |
| 30 | Residential Care- Transfer to long term care home (24-hour nursing, mental health, or addiction treatment centre) |

## Table 9: Grouping of Discharge Location from Inpatient Admissions1

|  |  |  |
| --- | --- | --- |
| **DAD** | | |
| **ICD-10 Code** | **Description** | **Study Grouping** |
| 7 | Died | Died |
| 72 | Died in facility |
| 6 | Left AMA | Left Against Medical Advice |
| 61 | Absent without leave (AWOL) |
| 62 | Left against medical advice (LAMA) |
| 65 | Did not return from leave |
| 4 | Discharge home with support | Home (with or without support, correctional facility, transitional home, etc.) |
| 5 | Discharge home without support |
| 40 | Transfer to group/supportive living |
| 90 | Transfer to correctional |
| 3 | Transfer to OTHER care (ambulatory, palliative, etc.). | Transfer to another acute care locations within hospital or between hospitals (can include Mental Health) |
| 10 | Transfer to reporting or another facility for inpatient |
| 2 | Transfer to Continuing Care | Transfer to non-acute care facilities; LTC, Mental health or Addiction Facilities |
| 30 | Transfer to residential care |

## Table 10: Groupings of Comorbidities

|  |  |
| --- | --- |
| **Disease State** | **Grouping** |
| Major Depressive Disorder, single episode | Mental Health Disorder |
| Major Depressive Disorder, recurrent episode |
| Anxiety Disorders (GAD, mixed, panic) |
| Agoraphobia |
| Obsessive-compulsive disorder |
| Post-traumatic stress disorder (+ reaction to severe stress) |
| Schizophrenia |
| Schizoaffective |
| Persistent mood [affective] disorders |
| Unspecified mood [affective] disorder |
| Bipolar Disorder Type 1 and 2 |
| Manic Disorder |
| Personality disorders |
| Attention Deficit Hyperactivity Disorder |
| Eating Disorder |
| Homelessness | Homelessness |
| Alcohol Related Disorders | Addiction Disorder |
| Opioid Related Disorders |
| Cannabis Related Disorders |
| Sedative, hypnotic or anxiolytic related disorder |
| Cocaine related disorder |
| Other stimulant related disorder |
| Hallucinagen related disorder |
| Other psychoactive substance related disorder |
| Chronic Pain | Chronic Health Disorder |
| Human Immunodeficiency Virus (any related) |
| Active Cancer |
| Cardiovascular Disease (HF, MI, Stroke, PVD) |
| Diabetes |
| COPD |
| Dementia |
| Kidney Disease (Acute kidney + chronic kidney disease) |
| Liver cirrhosis |

## Table 11: Grouping of Consults

|  |  |
| --- | --- |
| **Epic® Procedure Order Display Name** | **Grouping** |
| NA | No Consult |
| Psychiatric Emergency Services (PES) consult | Mental Health Consult |
| Psychologist consult |
| Neuropsychology consult |
| Consultation Liaison Psychiatry Services inpatient consult |
| Behavioral Therapy Consult |
| Behavioral Supports Ontario inpatient consult |
| Cognitive Behavioral Therapy inpatient consult |
| Consult to Mood Disorders tertiary mental health |
| Consult to Schizophrenia tertiary mental health |
| Social Work inpatient consult | Social Work Consult |
| PES Social Work Consult |
| Integrated Comprehensive Care (ICC) inpatient consult |
| Concurrent Capacity Building Team inpatient consult | Concurrent Capacity and Addiction Consult |
| Inpatient Consult to Clinical Pharmacology and Toxicology | CPICs Consult |
| Pharmacy general consult | Pharmacy Consult |

## Table 12: Grouping of Admissions to Special Care Units1

|  |  |  |
| --- | --- | --- |
| ICD-10 Code | Description | Grouping |
| 99 | No Special Care Unit | No admission to a special care unit |
| 45 | Coronary Intensive Care Nursing Unit (medical) | Admission to the Intensive Care Unit |
| 95 | Step-down Surgical Unit | Admission to the Medical or Surgical Step-Down Unit |
| 30 | Combined Medical, Surgical Care Nursing Unit | Admission to both the Intensive Care and Medical/Surgical Step-Down units |

## Table 13: Grouping of Admitting Physician Services

|  |  |
| --- | --- |
| **Service** | **Groupings** |
| Psychiatry | Psychiatry |
| Internal Medicine, Cardiology, Nephrology, Gastroenterology, Respirology, Neurology and Urology | Internal Medicine |
| Critical Care | Critical Care |
| General, orthopaedic, thoracic and otolaryngology surgery | Surgery |
| Emergency | No admitting Service |

## Table 14: Grouping of Selected Lab Values Ordered

|  |  |
| --- | --- |
| **Lab Value Order Name** | **Grouping** |
| Drug Screen Panel (emergency) | Drug Screen |
| Drug Screen Faeces |
| Drug Screen, hair |
| Drug Screen, Urine |
| POCT rapid urine drug panel |
| Barbiturate Screen |
| Phenothiazine Screen, urine |
| Acetaminophen level | Acetaminophen |
| Salicylate level | Salicylate |
| Alcohols and ethylene glycol | Ethanol |
| Ethanol |
| Ethanol, urine |
| Opiate, urine, qualitative | Elicit Substances |
| Phencyclidine (PCP), urine |
| Fentanyl, urine |
| Cocaine, urine, qualitative |
| Amiodarone level | Therapeutic Drug |
| Amitriptyline level |
| Carbamazepine level, total |
| Clonazepam level |
| Cyclosporine level |
| Dabigatran level |
| Digoxin level |
| Doxepin level |
| Gabapentin level |
| Haloperidol level |
| Imipramine level |
| Lamotrigine level |
| Lidocaine level |
| Lithium level |
| Methotrexate level |
| Nortriptyline level |
| Phenobarbital level |
| Phenytoin level |
| Primidone level |
| Sirolimus level |
| Tacrolimus level |
| Theophylline level |
| Topiramate level |
| Valproic acid level |
| Protime-INR | Coagulation |
| XA Heparin standard |
| Factor 10 activity |

# **Appendix F: Tabulation of All Results**

## Table 15: Classes of Drugs Involved in Diagnosed Drug Poisonings (% per visit)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **All Drug Poisonings** | **Intentional Drug Poisonings** | **Unintentional Drug Poisonings** | **Unknown Intent of Drug Poisoning** |
| Antimicrobials | 27 (0.91) | 15 (0.10) | 12 (0.97) | 0 (0) |
| Hormones | 111 (3.72) | 62 (4.12) | 45 (3.64) | 4 (1.65) |
| Salicylates | 33 (1.11) | 26 (1.73) | 7 (0.57) | 0 (0) |
| Acetaminophen | 436 (14.62) | 329 (21.86) | 93 (7.52) | 14 (5.79) |
| NSAIDs | 149 (4.09) | 122 (8.11) | 26 (2.10) | 1 (0.41) |
| Other non-opioid analgesics | 5 (0.17) | 3 (0.20) | 2 (0.16) | 0 (0) |
| Fentanyl | 238 (7.98) | 26 (1.73) | 197 (15.94) | 15 (6.20) |
| Heroin | 182 (6.10) | 10 (0.66) | 142 (11.49) | 30 (12.40) |
| Methadone | 21 (0.70) | 5 (0.33) | 15 (1.21) | 1 (0.41) |
| Prescription Narcotics excluding fentanyl and methadone | 174 (5.83) | 97 (6.45) | 70 (5.66) | 7 (2.89) |
| Other opioids | 259 (8.68) | 39 (2.59) | 185 (14.97) | 35 (14.46) |
| Cocaine | 105 (3.52) | 30 (1.99) | 58 (4.69) | 17 (7.02) |
| Cannabis | 61 (2.04) | 11 (0.73) | 43 (3.48) | 7 (2.89) |
| Psychedelics | 87 (2.92) | 9 (0.60) | 57 (4.61) | 21 (8.68) |
| Anaesthetics | 6 (0.20) | 2 (0.13) | 3 (0.24) | 1 (0.41) |
| Benzodiazepines | 515 (17.26) | 375 (24.92) | 112 (9.06) | 28 (11.57) |
| Antiparkinsonisms | 52 (1.74) | 28 (1.86) | 19 (1.54) | 5 (2.07) |
| Antiepileptics | 337 (11.30) | 253 (16.81) | 75 (6.07) | 9 (3.72) |
| Other Psychostimulants | 163 (5.46) | 51 (3.39) | 95 (7.69) | 17 (7.02) |
| Tricyclic antidepressants | 47 (1.58) | 41 (2.72) | 5 (0.40) | 1 (0.41) |
| Other antidepressants | 449 (15.05) | 364 (24.19) | 74 (5.99) | 11 (4.55) |
| Antipsychotics | 273 (9.15) | 210 (13.95) | 54 (4.37) | 9 (3.72) |
| Other Psychotropics | 25 (0.84) | 9 (0.60) | 14 (1.13) | 2 (0.83) |
| Drugs primarily affecting the autonomic nervous system | 102 (3.42) | 63 (4.19) | 33 (2.67) | 6 (2.48) |
| Antiallergic and antiemetic | 152 (5.10) | 118 (7.84) | 29 (2.35) | 5 (2.07) |
| Hematologic Agents | 38 (1.27) | 24 (1.59) | 13 (1.05) | 1 (0.41) |
| Cardiovascular Drugs | 85 (2.88) | 54 (3.59) | 28 (2.26) | 3 (1.24) |
| Gastrointestinal Drugs | 35 (1.17) | 24 (1.59) | 9 (0.73) | 2 (0.83) |
| Drugs affecting smooth muscles | 39 (1.30) | 30 (1.99) | 8 (0.65) | 1 (0.41) |
| Topical Drugs | 16 (0.54) | 7 (0.47) | 9 (0.73) | 0 (0) |
| Diuretics | 15 (0.50) | 8 (0.53) | 7 (0.57) | 0 (0) |
| Other drugs | 147 (4.93) | 58 (3.86) | 60 (4.85) | 29 (11.98) |