

## Concepts in Disaster Medicine

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# Disaster Preparedness: Hospital Pharmacy Strategy for Prioritized Inventory Management and Drug Procurement on Vancouver Island

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## Abstract

Disaster events can increase demand for medication supplies and interfere with supply chains, leading to compromised care in hospitals. Providing an organized response to an additional surge of disaster-related patients requires pre-planned emergency management procedures. Hospital pharmacists can address this with prioritized drug procurement and inventory management strategies which may improve the availability of key medications for a disaster response. Previous disaster events have provided insight on medications used to treat disaster-related injuries and exacerbations of medical conditions in emergency departments. This article provides a detailed description of Vancouver Island's hospital pharmacy strategy for the procurement and minimum stock levels of high priority medications in preparation for a disaster.

## Introduction

A disaster is defined as an event which overwhelms the response capability or resources of a community.<sup>1</sup> The nature of these sometimes large, unpredictable events, may require unconventional, and perhaps more complex procedural responses. This emphasizes the importance of an emergency preparedness plan before a major disaster occurs.

Large scale disasters create additional strains on health care systems which are often already operating at near-capacity levels in terms of physical space, diagnostics, and human resources. Impacts on medication supplies and supply chains have been documented in several past disasters and the COVID-19 pandemic has also provided challenges not typically seen with more localized disaster events. Integration of pharmacy services is an important component of disaster preparedness to ensure that selection, availability, and storage of additional medication supplies are appropriate for the treatment of patients at the time of the disaster and for a significant duration of the recovery period.<sup>2</sup>

Hospitals should identify disaster potentials for their location when developing an appropriate disaster plan.<sup>3</sup> Examples of disasters which can be considered during this process are listed in [Table 1](#) and are often classified as natural, man-made, or technological.<sup>1,4</sup> The potential for a natural disaster depends on factors such as geographical location, season, and climate variations.<sup>1</sup> Of high concern to Vancouver Island and the Pacific Coastal Region is a magnitude 7.1 to 9.0 Richter scale earthquake and resulting tsunami, which are predicted to occur along the Cascadia Subduction Zone within the next 50 years.<sup>5,6</sup> Preparing for a major earthquake on Vancouver Island is thought to also meet the needs of many other disasters that can occur within this region.

In preparation for a disaster, some medical needs may be predictable according to the disaster type (e.g., musculoskeletal injuries post-earthquake)<sup>7–13</sup>; however, some patient presentations following a disaster may be less intuitive.<sup>9,14–16</sup> Descriptions of past disasters suggest patients present to healthcare facilities for both acute and chronic medical conditions following a disaster.<sup>12,14,17–21</sup> These observations may be helpful in anticipating medications required during the initial emergency response.<sup>14,22</sup>

Establishing a disaster plan with medication suppliers prior to a disaster event is critical. Federal assistance in the form of medication supplies will likely be delayed and the list of medications available through this source is not widely known.<sup>23–25</sup> Given that community pharmacies are privately owned and separate entities from public health care in Canada, hospitals cannot expect access to medication supplies from these businesses during a disaster event. It may also be advantageous in reducing emergency department (ED) presentations if these pharmacies can provide medications to patients.

Island Health is a publicly funded health authority which provides healthcare services across Vancouver Island and Mount Waddington Coastal regions of British Columbia. Over 850000 people are serviced by more than 150 healthcare facilities including hospitals

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**Table 1.** Potential disaster scenarios<sup>1,34–36</sup>

<b>Natural</b>
– Avalanches
– Drought
– Earthquakes
– Floods
– Heat waves
– Landslides
– Pandemic
– Thunderstorms
– Tornadoes
– Tsunamis
– Volcanic activity
– Wildfires
– Winter storms
<b>Man-made and Technological</b>
– Aircraft accident
– Dam failures
– Explosions (chemical, nuclear, munitions)
– Fires (uncontrolled fires in residential, commercial, industrial or other properties in rural or developed areas)
– Hazardous material (mass exposure)
– Marine (navy, cruise ship)
– Motor vehicle collisions (multiple, bus, train)
– National security hazards
– Power outages
– Riots
– Telecommunications failures

and other healthcare centres. The aim of this paper is to provide healthcare professionals with Island Health Authority's emergency preparedness strategy which describes the selection, over-stocking, and procurement of key medications for hospitals in preparation for a disaster event on Vancouver Island.

### Island Health Authority disaster preparedness strategy for medication supplies

#### *Creating a priority medication list for disaster preparedness*

To determine a list of medications that Island Health Authority could need in a major disaster, normal medication usage patterns were first identified before clinicians selected the high priority medications for a disaster response.

While imperfect, this health authority's best approximation of drug usage was based on purchasing data. A 3-year report was generated for the years 2017, 2018, and 2019 to identify drug names, the base unit of measure (BUOM), amounts purchased in each year, and the gross total for the 3 years. A preliminary list of medications was then selected by the emergency pharmacist based on the likelihood of increased usage in a disaster and the potential for clinical harm should these medications run out. Lessons from previous literature, and resources such as the World Health Organization's Model List of Essential Medicines and the Interagency Emergency Health Kit, were used to assist in determining the key medications that should be in the disaster plan.<sup>26,27</sup> Additional subjective recommendations were provided by the emergency pharmacist to include medications that should also be considered by the broader stakeholder group.

Once the preliminary list was created, 3 medication stocking strategies were drafted. Category A consists of medications that should be overstocked and have an immediate purchase order at the time of initiating the disaster plan. Depletion of category A

medications is subjectively considered to be associated with a higher likelihood of patient harm and/or a significant impact on patient flow in the healthcare system within the first 72 hours post-disaster. Category B requires an immediate order of these medications if a disaster occurs, but no perpetual overstocking. Selection of these medications was subjectively based on the potential for patient harm or a significant impact on patient flow within a week. Category C consists of all other medications considered low risk for patient harm or bottlenecks of healthcare services should they become depleted. These medications are ordered per normal procedures (i.e., as supplies reach minimum quantities without a pre-emptive purchase order or overstocking). Additional factors in determining the strategy for each medication included the likelihood of the medication to be easily available to patients within the community and possible altered usage during a disaster.

Following the preliminary categorization of medications, stakeholders including physicians and clinical pharmacy specialists from emergency, critical care, cardiology, ophthalmology, anaesthesiology, psychiatry, pediatrics, neonatology, internal medicine, nephrology, and infectious disease were asked to review all 143 drugs in category A, all 238 drugs in category B, and 220 of 2816 drugs in category C. The subset of category C medications was selected by the emergency pharmacist for broader review to determine if these medications should continue to be excluded from categories A and B. Stakeholder feedback including potential additions to the list, was then used to finalize the disaster strategy for each item. In situations with conflicting recommendations, a panel of 4 clinical pharmacy specialists reached a consensus on the final disaster medication list. Order sheets were then created for use at the time of a disaster (Tables 2, 3, and 4). The final numbers were 159 drugs in category A, 254 drugs in category B and the remaining drugs in category C.

#### *Defining overstock quantities*

Current pharmacy inventory levels provide a 2-to-4-week supply. Informal communications with a small selection of larger hospitals in different geographies within Canada (1 in each of British Columbia, Alberta, Ontario, Quebec, Newfoundland, New Brunswick, and the Yukon) suggested that a usual range of 2-to-4 weeks inventory level is not uncommon. However, hospitals in Quebec are reported to have inventory levels lasting 9 to 10 weeks for most drugs. A decision was made to target a 6-to-12 weeks supply of category A drugs within Island Health if possible. Prioritization of these includes analgesics, sedatives, paralytics, vasopressors, inotropes, broad spectrum antibiotics, and bronchodilators. The full list of category A medications are marked with an asterisk in Tables 2, 3, and 4. Operationalizing this plan is ongoing since the implications of space, initial overstock cost, and possible wastage all provide challenges. Given that the overstock will simply be extra supply on hand moved through the normal rotation of medication use in hospital, wastage and additional cost impacts will be minimal.

#### **Disaster binder and workflow**

Disaster binders were created so procedures can be operationalized under duress, possibly by people who are unfamiliar with the pharmacy purchasing procedures. The first binder provides an overview of the ordering process, followed by vendor and

**Table 2.** Medications listed in the controlled drug order form for Island Health Authority during a disaster

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
acetaminophen 300 mg/codeine 30 mg/caffeine 15 mg tablet	bottle/ 500	1	2	4	6
buprenorphine-naloxone sublingual 2 mg-0.5 mg tablet	bottle/ 30	1	2	4	6
buprenorphine-naloxone sublingual 8 mg-2 mg tablet	bottle/ 30	1	2	4	6
clobazam 10 mg tablet	box/ 30	1	2	4	6
clonazepam 0.25 mg tablet	bottle/ 100	1	2	4	6
*clonazepam 0.5 mg tablet	bottle/ 100	1	2	4	6
*diazepam 10 mg tablet	bottle/ 100	1	2	4	6
*diazepam 5 mg tablet	bottle/ 100	1	3	6	9
*diazepam 5 mg/mL ampoule - 2 mL	box/ 10	1	3	6	9
fentaNYL 12 mcg/h patch	box/ 5	2	5	10	15
fentaNYL 25 mcg/h patch	box/ 5	2	5	10	15
*fentaNYL 50 mcg/mL ampoule - 2 mL	box/ 10	5	10	20	30
*fentaNYL 50 mcg/mL vial - 10 mL	box/ 10	2	4	8	12
fentaNYL 50 mcg/mL vial - 20 mL	box/ 5	1	1	2	3
*fentaNYL 50 mcg/mL vial - 5 mL	box/ 10	5	10	20	30
*HYDROmorphine 1 mg tablet unit dose	box/ 90	2	5	10	15
HYDROmorphine 10 mg/mL vial - 1 mL	box/ 10	1	3	6	9
*HYDROmorphine 2 mg tablet unit dose	box/ 90	1	3	6	9
*HYDROmorphine 2 mg/mL ampoule - 1 mL	box/ 10	5	10	20	30
HYDROmorphine 4 mg tablet unit dose	box/ 90	1	3	6	9
*ketamine 10 mg/mL vial - 2 mL	box/ 10	1	3	6	9
*ketamine 10 mg/mL vial - 20 mL	each	1	2	4	6
*ketamine 50 mg/mL vial - 2 mL	box/ 10	1	1	2	3
*ketamine 50 mg/mL vial - 10 mL	each	1	1	2	3
*LORazepam 0.5 mg sublingual tablet	bottle/ 100	1	1	2	3
*LORazepam 1 mg sublingual tablet	bottle/ 100	1	3	6	9
LORazepam 2 mg sublingual tablet	bottle/ 100	1	2	4	6
*LORazepam 4 mg/mL vial - 1 mL	box/ 10	2	5	10	15
methadone 1 mg tablet	bottle/ 100	1	2	4	6
methadone 10 mg tablet	bottle/ 100	1	2	4	6
methadone 5 mg tablet	bottle/ 100	1	2	4	6
*methadone 10 mg/mL liquid - 1000 mL	each	1	1	2	3
*midazolam 1 mg/mL vial - 10 mL	box/ 10	10	20	40	60
midazolam 1 mg/mL vial - 2 mL	box/ 10	1	3	6	9
*midazolam 1 mg/mL vial - 5 mL	box/ 10	1	2	4	6
*midazolam 5 mg/mL vial - 1 mL	box/ 10	1	3	6	9
*midazolam 5 mg/mL vial - 10 mL	box/ 10	1	2	4	6
midazolam 5 mg/mL vial - 2 mL	box/ 10	1	2	4	6
morphine 24h SR 100 mg capsule	bottle/ 50	1	2	4	6
morphine 12h ER 10 mg capsule	bottle/ 50	1	2	4	6

(Continued)

**Table 2.** (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
morphine 12h ER 15 mg capsule	bottle/ 50	1	2	4	6
morphine 12h ER 30 mg capsule	bottle/ 50	2	4	8	16
morphine 10 mg tablet	bottle/ 100	2	4	8	16
*morphine 10 mg/mL ampoule - 1 mL	box/ 10	25	50	100	150
*morphine 5 mg tablet	bottle/ 100	1	1	2	3
*morphine 50 mg/mL vial - 1 mL	box/ 10	2	5	10	15
morphine 50 mg/mL vial - 50 mL	each	3	6	12	18
oxazepam 15 mg tablet	bottle/ 1000	1	1	2	3
oxyCODONE 5 mg tablet	bottle/ 100	1	2	4	6
*remifentanyl 1 mg vial	box/ 10	10	25	50	75
SUFentanyl 50 mcg/mL ampoule - 1 mL	box/ 10	1	2	4	6
SUFentanyl 50 mcg/mL ampoule - 5 mL	box/ 10	1	2	4	6
zopiclone 5 mg tablet	bottle/ 100	3	6	12	18
zopiclone 7.5 mg tablet	bottle/ 100	5	10	20	30

\*Category A medications requiring a 6–12-week overstock target for pre-disaster stock on hand (may vary per site). All other medications listed are deemed Category B medications. Medications not listed are considered Category C medications.

staff contact lists, drug order forms, and a drug catalogue. The second binder contains reference resources including contact numbers and locations for the EOC, phonetic alphabet guide, Island Health Authority's Pharmacy Disaster Policy and Procedure, Pharmaceutical Vendor Business Continuity plans, and an inter-authority agreement.

An outline of the workflow is shown in [Figure 1](#). When a state of disaster is declared, the EOC determines the need to order an emergency supply of medications for each Island Health hospital location. The most senior South Island Pharmacy Leader in the EOC communicates this decision and coordinates pharmacy operations for Island Health as a whole. The Pharmacy Leader works with the EOC Logistics Leader to gather information including: the number of anticipated disaster patients for all 9 acute care hospitals (including rural sites supported by these acute care hospitals), the operational status of these sites (e.g., accessibility of current medication supplies), requirement for alternate delivery locations, and operational status of transportation and communications from areas that are shipping medication supplies. The EOC determines secure locations to store ordered drug supplies. The senior Pharmacy Leader in the EOC delegates either the Pharmacy Purchasing Coordinator, a Pharmacy Purchasing staff member, or an alternate pharmacy staff member to initiate the medication purchase orders, using additional staff as needed, for each site using the information provided by the EOC.

If all communications are functioning appropriately, the purchasing office will use standard purchasing procedures to initiate the purchase order using near normal processes. The vendor is then notified that the order placed requires immediate prioritization as part of the emergency disaster response.

Once the disaster purchase orders are submitted to the vendor (or activated by alternative means as described below), an update to the EOC Pharmacy Leader, geography EOCs, and

each site pharmacy leader is provided to confirm that the medication purchase orders are initiated. Additional feedback provided to the EOC includes an estimated time of delivery, the expected means of delivery, and instructions for proper handling and storage of medications such as narcotics, anesthetic gases, and medications requiring refrigeration.

If the disaster impacts the capacity for normal purchasing procedures, copies of the pre-planned order sheets are available with both the vendor and a geographically distanced health authority (Interior Health) in the event further assistance is required. Should the disaster prevent Island Health from initiating the purchase orders via normal procedures, the vendor will activate and process the immediate purchase orders (already on file) based on the estimated number of disaster patients expected at each site. This information may be relayed to the vendor through the EOC or via Interior Health. This disaster preparedness plan has been confirmed with the vendor.

At Island Health, there is an inter-authority partnership with Interior Health to initiate the medication purchase orders if Island Health is unable to complete the task. Interior Health is a publicly funded health authority which provides healthcare services across the Okanagan, Kootenay, Thompson, Cariboo, and Shuswap regions of British Columbia. This partnership was formed based on the use of similar purchasing processes in each region and the low likelihood that a major local disaster event will significantly affect both health authority populations at a given time. This partnership involves no cash exchange and requires sharing disaster binders and contact information in the event of a disaster.

Basic communication may become inoperable in the event of a disaster; therefore, satellite phone capabilities are required, and information must be updated when vendor or administrative contact names change.

**Table 3.** Medications listed in the non-controlled part 1 drug order form for Island Health Authority during a disaster

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
*acetaminophen 32 mg/mL syrup - 500 mL	each	5	10	20	30
*acetaminophen 500 mg tablet - unit dose	box/ 100	25	50	100	150
*acetaminophen 80 mg/mL drops - 24 mL	each	5	10	20	30
*acetaZOLAMIDE 250 mg tablet	bottle/ 100	1	2	4	6
*acetaZOLAMIDE sodium 500 mg vial	each	10	20	40	60
*adenosine 3 mg/mL vial - 2 mL	box/ 10	1	2	4	6
*alprostadil 500 mcg/mL ampoule - 1 mL	box/ 5	2	5	10	15
* <sup>†</sup> alteplase 100 mg vial	each	2	5	10	15
*amiodarone 50 mg/mL vial - 3 mL	box/ 10	5	10	20	30
*apraclonidine 0.5% drops - 5 mL	each	3	6	12	18
*acetylsalicylic acid 80 mg chew tablet	bottle/ 100	5	10	20	30
*acetylsalicylic acid EC 81 mg tablet	bottle/ 300	7	15	30	45
*atropine 0.1 mg/mL syringe - 10 mL	each	5	10	20	30
*atropine 0.6 mg/mL - 1 mL	box/ 10	5	10	20	30
*atropine 1% ophthalmic minim	box/ 20	1	2	4	6
*bupivacaine 0.25%/ EPINEPHRine vial - 20 mL	box/ 10	10	20	40	60
*bupivacaine 0.5% vial - 20 mL	box/ 10	10	20	40	60
*calcium chloride 10% syringe - 10 mL	box/ 10	5	10	20	30
*calcium gluconate 100 mg/mL vial - 10 mL	box/ 25	1	1	2	3
*cefazolin 1 g vial	box/ 25	12	25	50	75
*cefazolin 10 g vial	box/ 10	2	4	8	12
*cefixime 400 mg tablet	box/ 10	2	4	8	12
*ceftriaxone 1 g vial	box/ 10	7	15	30	45
*cefTRIAxone 2 g vial	box/ 10	7	15	30	45
cefuroxime 500 mg tablet	bottle/ 60	1	1	2	3
*clopidogrel 75 mg tablet	bottle/ 100	1	1	2	3
*cyclopentolate 1% drops - 15 mL	each	2	4	8	12
*cyclopentolate 1% minim	box/ 20	1	3	6	9
*cycloSPORINE neoral 10 mg capsule	box/ 60	1	3	6	9
*cycloSPORINE neoral 100 mg capsule	box/ 30	1	3	6	9
*cycloSPORINE neoral 25 mg capsule	box/ 30	1	3	6	9
*cycloSPORINE neoral 50 mg capsule	box/ 30	2	4	8	12
*dexamethasone 4 mg tablet	bottle/ 100	1	2	4	6
*dexamethasone 4 mg/mL vial - 5 mL	box/ 10	2	4	6	8
*dextrose 40% gel - 31 g	each	6	12	24	36
*dextrose 50% syringe - 50 mL	box/ 10	1	2	4	6

(Continued)

Table 3. (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
*diltiazem 180 mg ER capsule	bottle/ 100	1	1	2	3
*diltiazem 30 mg tablet	bottle/ 100	1	1	2	3
*diltiazem 5 mg/mL vial - 5 mL	box/ 10	1	2	4	6
*ePHEDrine 50 mg/mL ampoule - 1 mL	box/ 10	2	5	10	15
*EPINEPHrine 1 mg/mL ampoule - 1 mL	box/ 10	5	10	20	30
*EPINEphrine 1:10,000 syringe - 10 mL	box/ 10	1	2	4	6
*esmolol 10 mg/mL vial - 10 mL	box/ 25	1	1	2	3
*fluorescein 10% ampoule - 5 mL	box/ 12	1	1	2	3
*fluorescein 2% ophthalmic minim	box/ 20	2	4	6	8
*furosemide 10 mg/mL ampoule - 2 mL	box/ 10	10	20	40	60
*furosemide 10 mg/mL ampoule - 4 mL	box/ 10	5	10	20	30
*furosemide 20 mg tablet	bottle/ 100	5	10	20	30
*furosemide 40 mg tablet	bottle/ 100	5	10	20	30
*ibuprofen 20 mg/mL suspension - 120 mL	each	2	4	8	12
*ibuprofen 200 mg tablet unit dose	box/ 100	4	8	16	24
*ibuprofen 400 mg tablet	bottle/ 100	4	8	16	24
*imipenem-cilastatin 500 mg vial	box/ 10	5	10	20	30
*insulin glargine vial - 10 mL	each	5	10	20	30
*insulin lispro 100units/mL vial - 10 mL	each	20	45	90	135
*ipratropium 0.25 mg/mL nebule - 1 mL	box/ 20	15	30	60	90
*ipratropium 20 mcg inhaler	each	10	20	40	60
*ipratropium/salbutamol nebule - 2.5mL	box/ 20	12	25	50	75
*labetalol 5 mg/mL vial - 20 mL	each	7	15	30	45
*lidocaine 1% Polyamp - 5 mL	box/ 20	6	13	26	40
*lidocaine 2 % Polyamp - 5 mL	box/ 20	25	50	100	150
lidocaine 2% Polyamp - 10 mL	box/ 20	25	50	100	150
*magnesium sulfate 0.2 g/mL vial - 10 mL	box/ 10	2	5	10	15
*metoprolol 1 mg/mL injection - 5 mL	box/ 10	1	3	6	9
*metoprolol 25 mg tablet	bottle/ 100	5	10	20	30
*metroNIDAZOLE 250 mg tablet	bottle/ 500	2	4	8	12
*mycophenolate mofetil 250 mg capsule unit dose	box/ 100	5	10	20	30
*mycophenolate mofetil 500 mg tablet unit dose	box/ 50	10	20	40	60
*naloxone 0.4 mg/mL ampoule - 1 mL with preservative	box/ 100	10	20	40	60
*naloxone 0.4 mg/mL vial - 10 mL	each	10	20	40	60
*neostigmine methylsulfate 1 mg/mL vial - 10 mL	box/ 10	2	5	10	15
*NIFEdipine 5 mg capsule	bottle/ 100	1	3	6	9

(Continued)

Table 3. (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
*nitroglycerin 0.2 mg/h patch	box/ 100	1	3	6	9
*nitroglycerin 0.4 mg/dose spray	each	5	10	20	30
*nitroglycerin 0.4 mg/h patch	box/ 100	1	3	6	9
*norepinephrine 1 mg/mL vial - 4 mL	box/ 10	2	5	10	15
*norepinephrine 16 mg in normal saline - 250 mL	each	25	50	50	100
*ondansetron 2 mg/mL ampoule - 2 mL	box/ 5	10	25	50	75
*phenylephrine 10 mg/mL vial - 1 mL	box/ 10	10	20	40	60
*phenylephrine 300 mcg syringe - 3 mL	each	25	50	50	100
*phytonadione 10 mg/mL - 1 mL	box/ 10	2	5	10	15
*piperacillin-tazobactam 13.5 g vial	each	3	6	12	18
*piperacillin-tazobactam 3.375 g vial	box/ 10	10	20	40	60
*piperacillin-tazobactam 40.5 g vial	each	5	10	20	30
*polymyxin/bacitracin ointment - 15 g	each	750	1500	3000	4500
*polymyxin/gramicidin drops - 15 mL	each	5	10	20	30
*potassium phosphate 3 mmol/mL vial - 10 mL	box/ 10	3	6	12	18
*prednisolone 1% ophthalmic drops - 5 mL	each	5	10	20	30
*proparacaine 0.5% drops - 15 mL	each	1	2	4	6
*propofol 10 mg/mL vial - 100 mL	box/ 10	1	3	6	9
*propofol 10 mg/mL vial - 20 mL	box/ 10	5	10	20	30
*propofol 10 mg/mL vial - 50 mL	each	10	25	50	75
*ramipril 5 mg capsule	bottle/ 100	2	5	10	15
*ropivacaine 0.5% ampoule - 20 mL	box/ 5	1	3	6	9
*salbutamol 1 mg/mL nebule - 2.5 mL	box/ 20	20	40	80	120
*salbutamol 100 mcg inhaler	each	25	50	100	150
*sevoflurane inhaled solution - 250 mL	box/ 9	2	4	8	12
*sodium bicarbonate 1 mmol/mL (8.4%) vial - 50 mL	box/ 25	1	2	4	6
sodium bicarbonate 1 mmol/mL syringe - 50 mL	box/ 10	2	5	10	15
*sodium polystyrene 250 mg/mL suspension - 500 mL	each	2	5	10	15
*tacrolimus 0.5 mg capsule	bottle/ 100	2	4	8	12
*tacrolimus 1 mg capsule	bottle/ 100	3	6	12	18
tacrolimus 5 mg/mL ampoule - 1 mL	box/ 10	2	4	8	12
*tetanus-diphtheria vial - 0.5 mL	box/ 5	4	8	16	24
*tetracaine 0.5% ophthalmic minim	box/ 20	2	4	8	12

(Continued)

**Table 3.** (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
*ticagrelor 90 mg tablet	bottle/ 60	1	3	6	9
*tiotropium 18 mcg inhaled capsule with HandiHaler	box/ 30	2	5	10	15
*tiotropium 2.5 mcg inhaler	each	3	6	12	18
*tropicamide 1% ophthalmic minim	box/ 20	2	4	8	12
*verapamil 2.5 mg/mL vial - 2 mL	box/ 10	1	2	4	6

\*Category A medications requiring a 6-12 week overstock target for pre-disaster stock on hand (may vary per site). All other medications listed are deemed Category B medications. Medications not listed are considered Category C medications.  
 †Medications ordered through alternate vendors

**Table 4.** Medications listed in the non-controlled part 2 drug order form for Island Health Authority during a disaster

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
acyclovir 50 mg/mL vial - 10 mL	box/ 10	5	10	20	30
‡argatroban 100 mg/mL vial - 2.5 mL	each	2	5	10	15
amikacin 250 mg/mL - 2 mL	box/ 10	1	2	4	6
amiodarone 200 mg tablet	bottle/ 100	1	2	4	6
amLODIPine 10 mg tablet	bottle/ 100	1	2	4	6
amLODIPine 2.5 mg tablet	bottle/ 100	1	2	4	6
amLODIPine 5 mg tablet	bottle/ 100	1	3	6	9
amoxicillin 500 mg/clavulanic acid 125 mg tablet	bottle/ 100	1	1	2	3
*amoxicillin 875 mg/clavulanic acid 125 mg tablet	bottle/ 100	1	3	6	9
amoxicillin 50 mg/mL suspension - 100 mL	each	2	5	10	15
amoxicillin 500 mg capsule	bottle/ 100	1	3	6	9
ampicillin 1 g vial	box/ 10	2	5	10	15
apixaban 2.5 mg tablet	bottle/ 60	1	2	4	6
apixaban 5 mg tablet	bottle/ 180	1	2	4	6
apraclonidine 1% minim	box/ 12	1	1	2	3
atorvastatin 40 mg tablet	bottle/ 90	1	2	4	6
azithromycin 40 mg/mL suspension - 22.5 mL	each	2	4	8	12
*azithromycin 250 mg tablet	bottle/ 100	2	4	8	12
*azithromycin 500 mg vial	box/ 10	2	4	8	12
bisoprolol 5 mg tablet	bottle/ 100	2	4	8	12
*, †bovine liquid extract 27 mg/mL - 5 mL	each	2	5	5	10
brimonidine 0.2% drops - 5 mL	each	2	4	8	12
brinzolamide 1% ophthalmic suspension - 5 mL	each	2	4	8	12
budesonide 0.5 mg/mL nebule - 2 mL	box/ 20	2	4	8	12
‡bupivacaine 0.1% in normal saline - 250 mL	each	25	50	100	150
bupivacaine 0.25% vial - 20 mL	box/ 10	5	10	20	30
bupivacaine 0.5%/EPINEPHrine vial - 20 mL	box/ 10	5	10	20	30
bupivacaine hyperbaric 0.75% ampoule - 2 mL	box/ 10	2	5	10	15

(Continued)



Table 4. (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
calcium carbonate 1250 mg tablet	bottle/ 500	1	2	4	6
calcium carbonate 500 mg tablet	bottle/ 150	1	3	6	9
candesartan 16 mg tablet	bottle/ 100	1	2	4	6
candesartan 8 mg tablet	bottle/ 100	1	2	4	6
carBAMazepine 200 mg CR tablet	bottle/ 100	1	2	4	6
carBAMazepine 200 mg tablet	bottle/ 100	1	2	4	6
carboprost 250 mcg/mL vial - 1 mL	box/ 10	1	1	2	3
cefotaxime 1 g vial	box/ 10	2	5	10	15
*cefTRIAXone 10 g vial	each	4	6	12	15
*cephalexin 500 mg tablet	bottle/ 100	1	1	2	3
ciprofloxacin 2 mg/mL bag - 200 mL	box/ 10	1	2	4	6
ciprofloxacin 500 mg tablet	bottle/ 100	1	3	6	9
citalopram 20 mg tablet	bottle/ 100	1	3	6	9
clindamycin 150 mg capsule	bottle/ 100	1	1	2	3
clindamycin 150mg/mL vial - 4 mL	box/ 10	5	10	20	30
cotrimoxazole ampoule - 5 mL	box/ 10	1	2	4	6
cotrimoxazole 800-160 mg tablet	bottle/ 500	1	1	2	3
cotrimoxazole 400-80 mg tablet	bottle/ 100	1	2	4	6
dalteparin 5,000 units syringe - 0.2mL	box/ 10	1	2	4	6
desflurane inhaled solution	box/ 6	2	4	8	12
desmopressin 4 mcg/mL ampoule - 1 mL	box/ 10	1	2	4	6
*dexmedetomidine 100 mcg/mL vial - 2 mL	box/ 25	1	1	2	3
dexmedetomidine 4 mcg/mL vial - 100 mL	box/ 10	1	2	4	6
dexmedetomidine 4 mcg/mL vial - 50 mL	box/ 20	1	1	2	3
dextrose 50% vial - 50 mL	box/ 25	1	1	2	3
digoxin 0.125 mg tablet	bottle/ 250	1	1	2	3
digoxin 0.25 mg/mL ampoule - 2 mL	box/ 10	1	2	4	6
diltiazem 120 mg CD capsule	bottle/ 100	1	1	2	3
diltiazem 240 mg ER capsule	bottle/ 100	1	1	2	3
dimenhyDRINATE 50 mg tablet	bottle/ 100	1	3	6	8
dimenhyDRINATE 50 mg/mL ampoule - 1 mL	box/ 10	25	50	100	150
diphenhydrAMINE 25 mg capsule	bottle/ 100	1	3	6	9
diphenhydrAMINE 50 mg/mL vial - 1 mL	box/ 10	1	3	6	9
divalproex sodium 500 mg EC tablet	bottle/ 100	1	2	4	6
*DOBUTamine 12.5 mg/mL vial - 20 mL	box/ 10	1	2	4	6
* <sup>†</sup> DOPamine 1,600 mcg/mL bag - 250 mL	box/ 18	1	1	2	2
dorzolamide 2% drops - 5 mL	each	1	1	2	3
*doxycycline 100 mg capsule	bottle/ 100	1	2	4	6

(Continued)

Table 4. (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
enalaprilat 1.25 mg/mL vial - 2 mL	box/ 10	1	3	6	9
enoxaparin 100 mg/1 mL syringe	box/ 10	1	1	2	3
enoxaparin 100 mg/mL vial - 3 mL	each	7	15	30	45
*enoxaparin 30 mg/0.3 mL syringe	box/ 10	1	2	4	6
*enoxaparin 40 mg/0.4 mL syringe	box/ 10	1	2	4	6
enoxaparin 60 mg/0.6 mL syringe	box/ 10	1	2	4	6
enoxaparin 80 mg/0.8 mL syringe	box/ 10	1	2	4	6
†epoprostenol 1.5 mg vial	each	10	10	10	10
ergonovine 0.25 mg/mL ampoule - 1 mL	box/ 5	1	2	4	6
ertapenem 1 g vial	box/ 10	2	4	8	12
erythromycin 5 mg/g ophthalmic ointment - 3.5 g	each	3	6	12	18
erythromycin 5 mg/g ophthalmic ointment - minim	box/ 50	1	2	4	6
escitalopram 10 mg tablet	bottle/ 100	3	6	12	18
esmolol 10 mg/mL bag - 250 mL	box/ 10	1	1	2	3
filgrastim 300 mcg syringe - 0.5 mL	each	1	1	2	3
filgrastim 300 mcg vial - 1 mL	box/ 10	1	1	2	3
flumazenil 0.1 mg/mL vial - 5 mL	box/ 10	1	2	4	6
fluticasone 125 mcg inhaler	each	1	2	4	6
fluticasone 250 mcg inhaler	each	1	2	6	8
fluticasone 250 mg/salmeterol 50 mcg Diskus	each	2	5	10	15
fluticasone 250 mg/salmeterol 25 mcg inhaler	each	5	10	20	30
fondaparinux 2.5 mg/0.5 mL syringe	box/ 10	1	1	2	3
gentamicin 40 mg/mL vial - 2 mL	box/ 10	5	10	20	30
gliclazide 30 mg MR tablet	bottle/ 100	2	4	8	12
gliclazide 80 mg tablet	bottle/ 100	1	3	6	9
glucagon 1 mg injection kit	each	2	5	10	15
glucose 4 g chew tablet	bottle/ 10	5	10	20	30
glyBURIDE 2.5 mg tablet	bottle/ 100	2	4	8	12
glyBURIDE 5 mg tablet	bottle/ 100	2	4	8	12
*glycopyrrolate 0.2 mg/mL vial - 2 mL	box/ 10	2	4	8	12
haloperidol 1 mg tablet	bottle/ 100	3	6	12	18
haloperidol 5 mg/mL ampoule - 1 mL	box/ 10	2	5	10	15
†heparin 50 unit/mL bag - 500 mL	box/ 24	1	1	2	2
heparin 1,000 unit/mL vial - 10 mL	box/ 10	5	10	20	30
heparin 10,000 unit/mL vial - 5 mL	box 10	1	2	4	6
heparin 5000 unit/0.5 mL vial	box/ 25	2	4	6	8

(Continued)

Table 4. (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
hydrALAZINE 10 mg tablet	bottle/ 100	2	4	6	8
hydrALAZINE 25 mg tablet	bottle/ 100	1	2	4	6
hydrocortisone sodium succinate 100 mg vial	Box/ 10	2	5	10	15
idarucizumab 2.5 g vial	box/ 2	1	1	2	3
indomethacin 25 mg capsule	bottle/ 100	1	3	6	9
insulin glargine 100 units/mL - 3mL prefilled pen	box/ 5	1	2	4	6
insulin NPH 100 units/mL vial - 10 mL	each	7	15	30	45
insulin regular 100 units/mL vial - 10 mL	each	7	15	30	45
iodine 5% solution	each	1	1	2	3
ketorolac 30 mg/mL vial - 1 mL	box/ 10	10	25	50	75
lactulose 667 mg/mL syrup - 15 mL unit dose	box/ 20	2	4	8	12
lamoTRigine 100 mg tablet	bottle/ 100	1	3	6	9
lamoTRigine 25 mg tablet	bottle/ 100	1	3	6	9
latanoprost 0.005% drops - 2.5 mL	each	3	6	12	18
levetiracetam 100 mg/mL vial - 5 mL	box/ 10	1	1	2	3
levETIRAcetam 250 mg tablet	bottle/ 100	1	2	4	6
levETIRAcetam 750 mg tablet	bottle/ 100	1	1	2	3
levodopa-carbidopa 100 mg-25 mg tablet	bottle/ 100	1	3	6	9
levodopa-carbidopa 250 mg-25 mg tablet	bottle/ 100	1	2	4	6
levodopa-carbidopa CR 100 mg-25 mg tablet	bottle/ 100	1	3	6	9
levodopa-carbidopa CR 200 mg-50 mg tablet	bottle/ 100	1	2	4	6
lidocaine 2% gel syringe	box/ 25	2	5	10	15
lidocaine 2% gel syringe	box/ 10	2	5	10	15
lidocaine 1% vial with preservative - 20 mL	box/ 10	50	100	200	300
lidocaine 1%/epinephrine 1:10,000 vial - 20 mL	box/ 10	5	10	20	30
lidocaine 2% viscous solution - 100 mL	each	7	15	30	45
lidocaine 4% cream - 5 g	box/ 12	3	7	14	21
linezolid 2 mg/mL bag - 300 mL	box/ 10	1	1	2	3
loperamide 2 mg tablet	bottle/ 100	1	3	6	9
losartan 50 mg tablet	bottle/ 100	1	2	4	6
loxapine 2.5 mg tablet	bottle/ 100	1	3	6	9
loxapine 50 mg/mL ampoule - 1 mL	box/ 10	2	5	10	15
magnesium sulfate 2 mmol/mL vial - 10 mL	box/ 25	1	3	6	9
†magnesium sulfate 2 g in normal saline - 54 mL	each	25	50	100	150
mannitol 250 mg/mL vial - 50 mL	box/ 25	1	1	2	3
*,†mannitol 20% bag - 500 mL	each	10	25	50	50
meropenem 1 g vial	box/ 10	1	2	4	6
meropenem 500 mg vial	box/ 10	1	3	6	9
metFORMIN 500 mg tablet	bottle/ 100	5	10	20	30

(Continued)

Table 4. (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
methotrimeprazine 25 mg/mL ampoule - 1 mL	box/ 10	1	1	2	3
*methylPREDNISolone 125 mg vial	box/ 10	1	2	4	6
methylPREDNISolone 40 mg vial	box/ 10	1	2	4	6
metoclopramide 5 mg tablet	bottle/ 100	1	3	6	9
metoclopramide 5 mg/mL vial - 2 mL	box/ 10	2	5	10	15
metoprolol 50 mg tablet	bottle/ 100	3	6	12	18
metroNIDAZOLE 5 mg/mL bag - 100 mL	each	60	120	240	360
midodrine 5 mg tablet	bottle/ 100	1	3	6	9
misoprostol 200 mcg tablet	bottle/ 100	1	2	4	6
moxifloxacin 0.5% drops - 3 mL	each	3	6	12	18
moxifloxacin 400 mg tablet	bottle/ 100	1	2	4	6
moxifloxacin 1.6 mg/mL bag - 250 mL	box/ 10	2	4	8	10
mupirocin 2% cream - 15 g	each	125	250	500	750
mupirocin 2% ointment - 15 g	each	3	6	12	18
mycophenolate sodium EC 180 mg tablet unit dose	box/ 120	5	10	20	30
mycophenolate sodium EC 360 mg tablet	box/ 120	10	20	40	60
naloxone 1 mg/mL vial - 2 mL	box/ 10	2	4	8	12
NIFEdipine 30 mg XL tablet	bottle/ 100	1	3	6	9
nimodipine 30 mg tablet unit dose	box/ 100	1	1	2	3
nitroglycerin 0.6 mg/h patch	box/ 100	1	2	4	6
nitroglycerin 0.8 mg/h patch	box/ 30	1	2	4	6
OLANZapine 10 mg tablet	bottle/ 100	2	5	10	15
OLANZapine 2.5 mg tablet	bottle/ 100	2	4	8	12
OLANZapine 5 mg tablet	bottle/ 100	2	4	8	12
olanzapine 5mg ODT tablet	box/ 30	2	5	10	15
ondansetron 4 mg tablet	bottle/ 100	5	10	20	30
oxytocin 10 unit/mL ampoule - 1 mL	box/ 10	10	20	40	60
pantoprazole magnesium EC 40 mg tablet	bottle/ 100	15	30	60	90
pantoprazole sodium 40 mg vial	box/ 10	25	50	100	150
phenylephrine 10% ophthalmic minim	box/ 20	5	10	20	30
phenytoin 100 mg capsule	bottle/ 1000	1	1	2	3
phenytoin 30 mg capsule	bottle/ 100	1	3	6	9
phenytoin 50 mg tablet	bottle/ 100	1	2	4	6
phenytoin 50 mg/mL vial - 2 mL	box/ 10	1	2	4	6
phenytoin 50 mg/mL vial - 5 mL	box/ 10	1	2	4	6
pilocarpine 2% ophthalmic minim	box/ 20	1	2	4	6
piperacillin-tazobactam 2.25 g vial	box/ 10	1	3	6	9
piperacillin-tazobactam 4.5 g vial	box/ 10	5	10	20	30
potassium chloride 1.33 mmol/mL solution - 500 mL	each	2	4	8	12

(Continued)

Table 4. (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
*, <sup>†</sup> , <sup>§</sup> potassium chloride 10 mmol in SWFI - 100 mL	box/ 30	2	3	5	5
*, <sup>†</sup> , <sup>§</sup> potassium chloride 20 mmol in SWFI - 50 mL	box/ 30	1	1	2	2
potassium chloride 1500 mg SR tablet	bottle/ 100	3	6	12	18
potassium chloride 600 mg SR tablet	bottle/ 100	5	10	20	30
<sup>†</sup> , <sup>‡</sup> potassium phosphate 15 mmol in D5W - 255 mL	each	10	25	25	50
pramipexole 0.25 mg tablet	bottle/ 100	1	2	4	6
predniSONE 5 mg tablet	bottle/ 1000	1	1	2	3
predniSONE 50 mg tablet	bottle/ 100	1	1	2	3
protamine 10 mg/mL vial - 5 mL	box/ 10	3	6	12	18
pyridostigmine 60 mg tablet	bottle/ 100	1	1	2	3
QUetiapine 25 mg tablet	bottle/ 100	5	10	20	30
ramipril 10 mg capsule	bottle/ 100	1	3	6	9
ramipril 2.5 mg capsule	bottle/ 100	2	5	10	15
risperiDONE 0.25 mg tablet	bottle/ 100	2	5	10	15
risperiDONE 0.5 mg tablet	bottle/ 100	1	3	6	9
rivaroxaban 10 mg tablet	bottle/ 50	3	6	12	18
rivaroxaban 15 mg tablet	bottle/ 90	3	6	12	18
rivaroxaban 20 mg tablet	bottle/ 90	3	6	12	18
*rocuronium 10 mg/mL vial - 5 mL	box/ 10	15	25	50	75
rOPINIRole 0.25 mg tablet	bottle/ 100	1	2	4	6
rosuvastatin 10 mg tablet	bottle/ 90	2	4	8	12
rosuvastatin 20 mg tablet	bottle/ 90	1	3	6	9
sennosides A & B 12 mg tablet	bottle/ 100	5	10	20	30
sertraline 50 mg capsule	bottle/ 100	3	6	12	18
sevelamer 800 mg tablet	bottle/ 180	1	2	4	6
silver sulfADIAZINE 1% cream - 50 g	each	1	3	6	9
silver sulfADIAZINE 1% cream - 500 g	each	1	2	4	6
sodium bicarbonate 0.5 mmol/mL syringe - 10 mL	box/ 10	1	2	4	6
<sup>†</sup> sodium chloride 3% bag - 250 mL	box/ 30	1	1	2	2
sodium chloride 23.4% (4 mmol/mL) - 30 mL	box/ 10	1	2	4	6
sodium citrate-citric acid solution - 500 mL	each	1	3	6	9
sodium phosphates 3 mmol/mL vial - 10 mL	box/ 10	1	1	2	3
spironolactone 25 mg tablet	bottle/ 100	1	2	4	6
sterile water for injection - 10 mL vial	box/ 20	3	6	12	18
*succinylcholine 20 mg/mL vial - 10 mL	box/ 10	1	2	4	6
sugammadex 100 mg/mL vial - 2 mL	box/ 10	1	2	4	6
sugammadex 100 mg/mL vial - 5 mL	box/ 10	1	2	4	6
tacrolimus 1 mg ER capsule	box/ 50	5	10	20	30
tacrolimus 5 mg ER capsule	box/ 50	2	5	10	15

(Continued)

Table 4. (Continued)

Drug Description	McKesson Purchase Unit	Order quantity per 200 disaster patients	Order quantity per 500 disaster patients	Order quantity per 1000 disaster patients	Order quantity per 1500 disaster patients
tamsulosin 0.4 mg CR tablet	bottle/ 100	2	4	8	12
*tenecteplase 50 mg/vial kit	each	2	5	10	15
thiamine 100 mg tablet	bottle/ 100	1	2	4	6
thiamine 100 mg/mL ampoule - 1 mL	box/ 10	1	3	6	9
timolol 0.5% drops - 5 mL	each	1	3	6	9
tobramycin 40 mg/mL 2mL vial	box/ 10	2	5	10	15
tobramycin 40 mg/mL 30mL vial	each	2	5	10	15
tobramycin/dexamethasone drops - 5 mL	each	1	1	2	3
tobramycin/dexamethasone ophthalmic ointment - 3.5 g	each	1	2	4	6
topiramate 100 mg tablet	bottle/ 100	2	4	8	12
topiramate 25 mg tablet	bottle/ 100	2	5	10	15
*tranexamic acid 100 mg/mL vial - 10 mL	box/ 10	2	5	10	15
triamcinolone acetonide 40 mg/mL vial - 1 mL	each	3	6	12	18
tropicamide 1% drops - 15 mL	each	1	1	2	3
valACYclovir 500 mg tablet	bottle/ 100	1	3	6	9
valproic acid 50 mg/mL syrup - 450 mL	each	1	3	6	9
*vancomycin 1 g vial	box/ 10	2	4	8	12
*vancomycin 10 g vial	each	2	5	10	15
*vasopressin 20 unit/mL vial - 1 mL	box/ 25	1	1	2	3
vasopressin 20 unit/mL vial - 5 mL	each	10	10	20	30
venlafaxine 150 mg XR capsule	bottle/ 100	1	3	6	9
venlafaxine 37.5 mg XR capsule	bottle/ 100	2	5	10	15
venlafaxine 75 mg XR capsule	bottle/ 100	3	6	12	18
verapamil 120 mg SR tablet	bottle/ 100	1	3	6	9
verapamil 180 mg SR tablet	bottle/ 100	1	1	2	3
verapamil 240 mg SR tablet	bottle/ 100	1	1	2	3
verapamil 80 mg tablet	bottle/ 100	1	3	6	9
warfarin 1 mg tablet	bottle/ 100	3	6	12	18
warfarin 2 mg tablet	bottle/ 100	1	3	6	9
warfarin 2.5 mg tablet	bottle/ 100	2	4	8	12
warfarin 3 mg tablet	bottle/ 100	1	3	6	9
xylometazoline 0.1% spray - 20 mL	each	2	4	8	12

\*Category A medications requiring a 6-12 week overstock target for pre-disaster stock on hand (may vary per site). All other medications listed are deemed Category B medications. Medications not listed are considered Category C medications.

†Medications ordered through alternate vendors

§SWFI = sterile water for injection

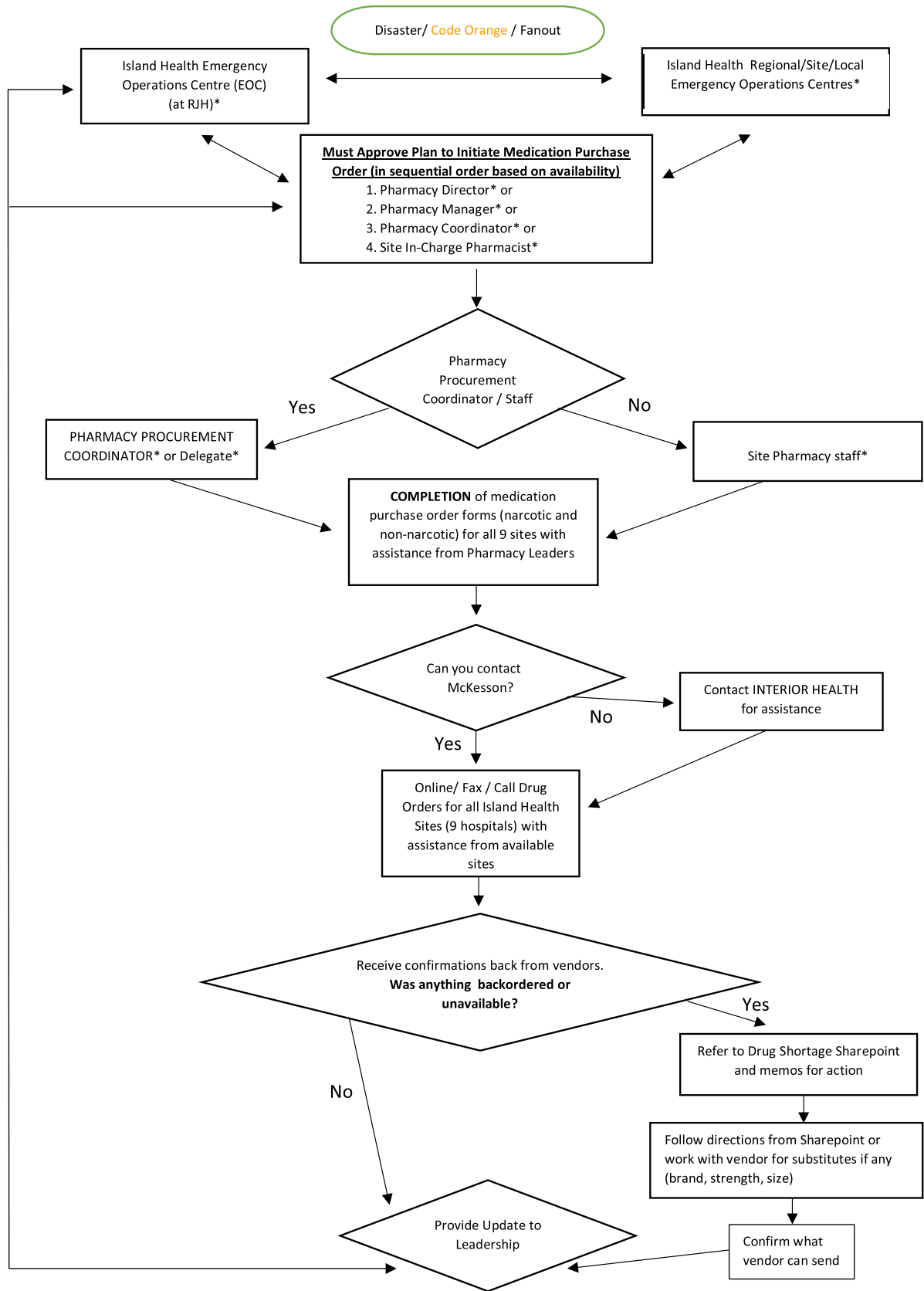
\*D5W = dextrose 5% in water

### Immediate purchase orders

To provide an efficient and simplified ordering process, the disaster purchase orders are created for 1 vendor only, even if some products are usually sourced from other vendors at a lower cost.

There are 3 order forms: controlled, non-controlled part 1, and non-controlled part 2 (see Tables 2, 3, and 4). Given the large number of medications on our disaster order list, these separate lists were created to improve efficiency and to prioritize the most

critical medications when sending purchase orders to the vendors while under the duress of an acute disaster. The medications from the controlled and non-controlled part 1 lists will be ordered for each site as soon as possible, and the drugs from the non-narcotic part 2 form will be ordered as time permits or in parallel with another purchaser on site if available. However, it is expected that all drugs from the 3 order forms will be ordered within 24 hours of a disaster.



**Figure 1.** Emergency/Disaster pharmacy drug ordering flowchart. \* Communications of this process may be initiated by anyone; however the medication purchase order must be approved as shown.

The order quantities for each medication on the purchase order forms are predetermined to facilitate a quick and efficient ordering process based on the anticipated number of disaster patients per site (provided by the EOC). While imperfect, these order quantities were based on current drug usage patterns per patient (defined by the 3-year purchase reports as described above), a subjective estimate of the increased usage in the event of a disaster, and the likelihood of increased outpatient medication dispensing. The order quantities were then rounded to appropriate orderable quantities on the order sheets for options of 200, 500, 1000, or 1500 disaster patients. If a hospital's current medication supply is not accessible due to the disaster, the purchase order may be increased by an additional 200-1000-patient supply (to be determined at the time of the disaster).

### Limitations

Different geographies may have different medication needs based on different disaster risks. A large earthquake and tsunami currently pose 1 of the greatest risks to Vancouver Island, but this is not the case for many other geographies. Some disasters may not require many medications in the response, so this described strategy may not be appropriate for all types of disasters.

This disaster plan is for medications only and must be coordinated with strategies for other supplies (e.g., syringes, needles, intravenous tubing). Medications not available through normal vendor procedures are ordered from specialty vendors or general stores. It is expected that most hospital pharmacy departments have an additional disaster plan for staffing. Initiating the procedures outlined in this document should be considered when creating a staffing plan.

It is unclear if having 1 person complete the purchase orders for all sites in a health authority is more advantageous than having staff from each site follow the disaster binder procedures. This may be disaster-dependent, and the outlined strategy provides the structure for either option at the EOC's discretion. The challenges with transportation and delivery of supplies during a disaster is typically handled by the EOC and outside the scope of this review.

Large scale disasters can impact medication supply chains, and there is no guarantee that an immediate drug order will be fulfilled and delivered efficiently during a disaster event. Therefore, inventory mitigation strategies were included as a surplus for target medications. However, physical space and avoiding drug wastage and budgetary losses are significant considerations.

While selecting the medications for use in a disaster, multiple drug strengths are ordered to avoid issues with backorders if a specific strength was not available at the time. However, choosing a single strength of a specific drug would allow for a shorter order list and quicker completion of the purchase order. Furthermore, the threshold of requiring 200 disaster patients to initiate a medication purchase order was arbitrarily chosen and there is no data to support this. It simply reflects a reasonable estimate of current surge capacity within Island Health. Previous disasters provided insight on the possible surge demand (including possible ED presentation and admission rates), but this data may not be generalizable to other geographies and disaster types.<sup>7,8,23,28-31</sup>

This strategy is based on numerous subjective assumptions. The EOC must provide an early estimate of the number of disaster patients expected to present to health care sites, which may be inaccurate at the onset of the disaster. Clinical judgment was used to create the list of medications for category A and B (i.e.,

overstocking and the immediate medication purchase orders). While a reasonable process for stakeholder input was included, broader input may further strengthen the final list of medications identified in this disaster plan. Analytics used to capture the number of patients seen in Island Health over the 3-year medication purchase order history (i.e., to create an estimate of normal drug usage patterns per patient) may not accurately represent medication usage for patients seen during a disaster event. Additionally, estimating the deviations from these calculated medication usage patterns during a disaster event is not evidence-based. Lastly, this strategy does not account for previous reports that medications could be hoarded out of panic by individuals in the healthcare industry.<sup>32,33</sup>

The authors acknowledge that such compromises lead to an imperfect disaster plan, but this may hopefully serve as a foundation for further iterations and discussions in disaster preparedness literature.

### Conclusion

While individualization of health authority disaster plans for medication supplies is important, this Island Health Authority disaster preparedness strategy for the procurement and minimum stock levels of high priority medications may provide a template for further disaster plan improvements.

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**Conflicts of interest.** None

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