

**A BRIEF LOOK AT DRUG OVERDOSE PRESENTATIONS TO THE SELKIRK  
REGIONAL HEALTH CENTRE 2017-2018**

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## Introduction

The Interlake-Eastern regional health authority (IERHA) presides over healthcare services offered in seventeen Manitoban communities serving a population totalling just greater than 127,000 people<sup>1</sup>. The region sees large fluctuations in population size as many people travel to the area to vacation during the summer months. Selkirk, Manitoba, located approximately 40 km from Winnipeg, serves as the major hub for the region's healthcare services. Services in Selkirk include ambulance and emergency medical and surgical services, hospital services (including MRI, CT, dialysis, and chemotherapy), personal care home services, community health services, mental health programs, and services specific to older adults such as meal programs, home care and handi-van services.

Selkirk, like the rest of Canada, has been heavily impacted by increasing opioid use and patients presenting with substance overdose. A recent study examined opioid poisoning leading to emergency department (ED) presentation in Alberta and Ontario as well as hospitalizations across Canada<sup>2</sup>. In Alberta it was found that those aged 15-24 and 25-44 had the highest and fastest growing rates of presentation to the ED due to opioid poisoning<sup>2</sup>. Nationally, the rate of hospitalizations due to opioid poisoning has increased by 53% over the past 10 years with an average of 16 hospitalizations daily across the country. In Manitoba the rate of hospitalizations in 2016/17 was 10.8 persons per 100,000, which was less than the national average (15.6 per 100,000).

While opioid overdoses account for a considerable number of drug overdose presentations, there are various other over-the-counter medications, prescription medications, and illicit drugs that are overdosed on and result in presentation to the ED. A study in the United States looked at all causes of drug poisoning between 2008-2011. Analgesics, antipyretics and

antirheumatics accounted for 24.4% of ED presentations for unintentional overdoses and 21.6% of self-inflicted overdoses. Sedatives, hypnotics, tranquilizers and other psychotropics accounted for 27.3% of unintentional overdoses and 31.7% of self-inflicted overdoses<sup>3</sup>. Similarly to the recent opioid overdose results from Alberta, drug poisoning presentation to the ED was highest in persons aged 20-34<sup>3</sup>. In this study females were found to be more likely to present with drug poisoning than males (51.2 drug poisoning presentations per 10,000 persons compared to 31.9 drug poisoning presentations per 10,000 persons respectively)<sup>3</sup>. A greater number of overdoses were due to unintentional poisoning (17.0 per 10,000) compared to self-inflicted drug poisoning (13.4 per 10,000).<sup>3</sup> However, when separating these presentations based on sex, females were more likely to present with self-inflicted drug poisonings compared to unintentional drug poisonings.<sup>3</sup>

As the number of people presenting with drug overdoses continues to be a problem in Canadian emergency departments, it is important to consider what resources are available for individuals who seek care related to addiction and overdose. In our study, we examined 50 charts of patients presenting with drug overdose to the Selkirk Regional Health Centre Emergency Department between March 2017 and April 2018.

In Selkirk and the surrounding Interlake region, only one major resource seems to be readily available for addictions help to the public; Addictions Foundation of Manitoba (AFM). AFM conducts adult and youth programs in Selkirk and Beausejour. Their programs, which tend to be one-on-one counselling based, are offered indefinitely to clients, and allows clients to work closely with counsellors to make a recovery plan. Client's files are closed when there is no contact for 3-6 months between the client and the counsellor; however, the client can re-open the

file if they should choose to in the future. AFM in the Interlake also serves as the gateway for referrals of clients to facility-based programs conducted out of Winnipeg, Brandon, or St. Rose.

For continued drug use, a sterile needle distribution program is available in Selkirk. This program runs out of the Selkirk community health office and allows for drop in pick-up of needles, cookers, sterile water, ties, alcohol swabs, band-aids, filters, sharps containers and gloves, as well as information provided by a harm-reduction nurse. Naloxone kits and education on use of these kits, is also available from the Selkirk community health office.

Anxiety Disorders Association of Manitoba (ADAM) provides an “overcoming anxiety program” from September to June each year in Selkirk, Gimli, Stonewall, Lac du Bonnet and Dugald. These programs offer cognitive behavioral therapy in predominantly a group environment, which is particularly focused at addressing anxiety related mental illness. In addition to ongoing mental health resources, Selkirk has both mobile crisis services and a crisis stabilization unit, which are aimed at short term crisis intervention for those dealing with mental illness. Other resources for mental health in the area include: Interlake-Eastern RHA central intake for mental health services, Interlake-eastern relational therapist, Canadian Mental Health Association and Mood Disorders Association of Manitoba.

In our study, we intended to examine the drugs or medications individuals in the Interlake were overdosing on, and collect demographic information about the people presenting with substance abuse symptoms to the Selkirk ED. Another goal was to produce a standard of care protocol for methamphetamine overdose if the burden of that specific type of overdose proved to be high in the region. By better understanding the patient population that is overdosing on illicit, prescription and over-the-counter drugs in the Interlake, we can hopefully develop more

comprehensive treatment plans and help medical staff caring for patients presenting with drug overdose.

**Methods**

Using codes for “Substance Abuse” and “Substance Intoxication” a list of presentations to the Selkirk Regional Health Center Emergency Department between April 2017 and March 2018 was generated. To determine which charts to use a random number generator was used. Virtual charts were viewed using Selkirk Regional Health Centre’s electronic chart storage system, Saluvision. Charts were excluded if the patient was less than 18 years old, if it was not clear that drugs had been consumed, if the patient had overdosed on strictly alcohol, or if the patient was actually in withdrawal and had not consumed substances within 24 hours. Charts were randomly selected until 50 useable charts were collected.

We collected various information from each chart we examined (Table 1). Data was recorded using Microsoft Excel 2016. Data was analysed using both Microsoft Excel 2016 and IBM’s SPSS 19 ed.

**Table 1.** Data collected from 50 randomly selected charts of overdose/intoxication to the Selkirk Regional Health Center Emergency Department between April 2017 and March 2018.

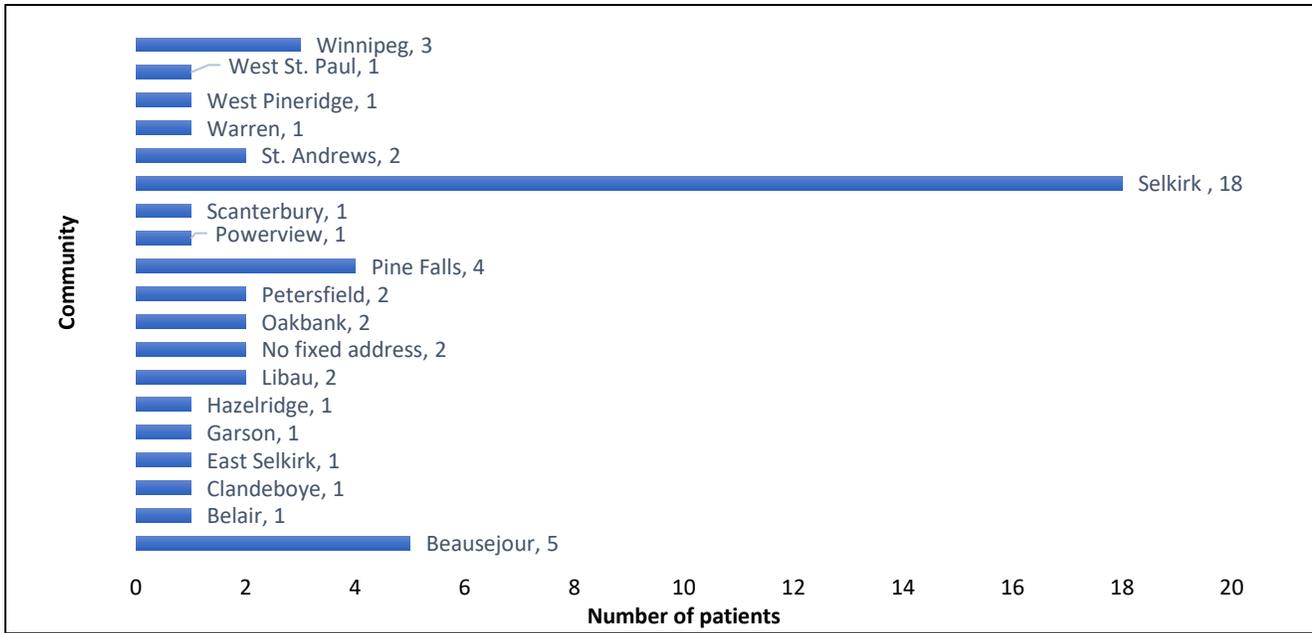
<b>Demographic Information</b>	<b>Substances consumed</b>	<b>ED Presentation</b>	<b>Vitals at Triage</b>	<b>ED Treatment</b>	<b>Past Medical History</b>
Sex	Type of drug/s	Date in ED/day of the week	Systolic Blood Pressure	Medications administered	Diabetes
Age	Illegal/non	Time Triage	Glasgow Coma Scale	Fluids administered	Hypertension
Place of Residence	Alcohol consumption	Mode of transport to ED	Heart Rate	Mental Health services offered	Liver disease
	Number of substances consumed	Recurrent or new			Depression
		Length of stay/admissions			Anxiety

## Results

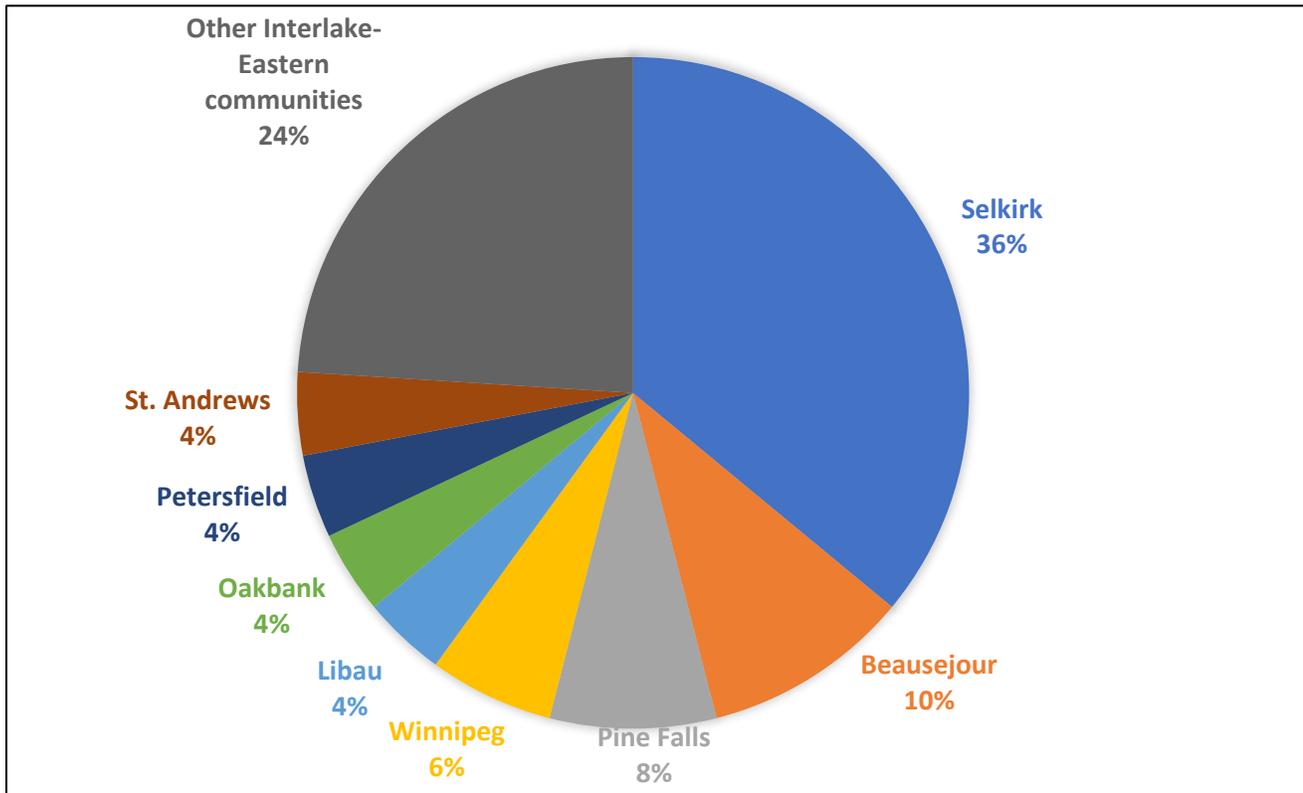
In total there was over 700 encounters to the emergency department (ED) throughout the year that had codes for substance abuse, intoxication or withdrawal. 99 charts were examined, and 49 excluded for various reasons including age <18, strictly alcohol related overdose, or experiencing withdrawal symptoms but not intoxication.

### *Patient demographics*

Our sample of 50 charts included 32 female and 18 male patients. The mean sample age was 33.6 years (SD 16.9). The median age was 27 years, and mode age 19 years. Female patients were on average younger than male patients ( $M_{\text{female}}=31.34$   $SD_{\text{female}}=2.71$ ,  $M_{\text{male}}=37.78$ ,  $SD_{\text{male}}=4.51$ ) but this difference was not significant ( $t=1.30$ ,  $df=48$ ,  $p=.199$ ). Patients presenting to the Selkirk Regional Health Center for substance abuse related concerns came from various towns and municipalities within the Interlake-Eastern region (Figures 1 & 2).



**Figure 1.** Complete record of the place of residence for 50 patients presenting to the Selkirk Emergency Department with substance abuse related concerns between April 2017 and March 2018. N=50.

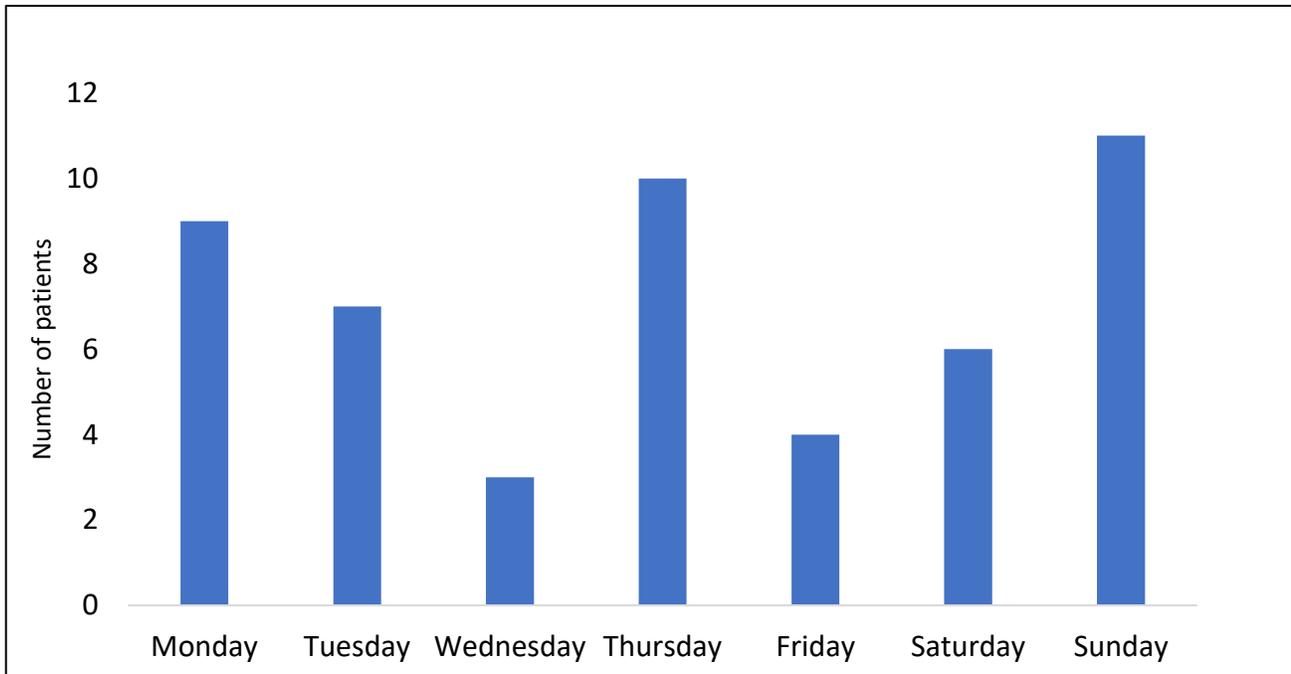


**Figure 2.** Percentage of patients presenting with substance abuse/intoxication to the emergency department who reside in various towns and cities surrounding the Selkirk Regional Health Center. N=50.

*Presentation to the ED*

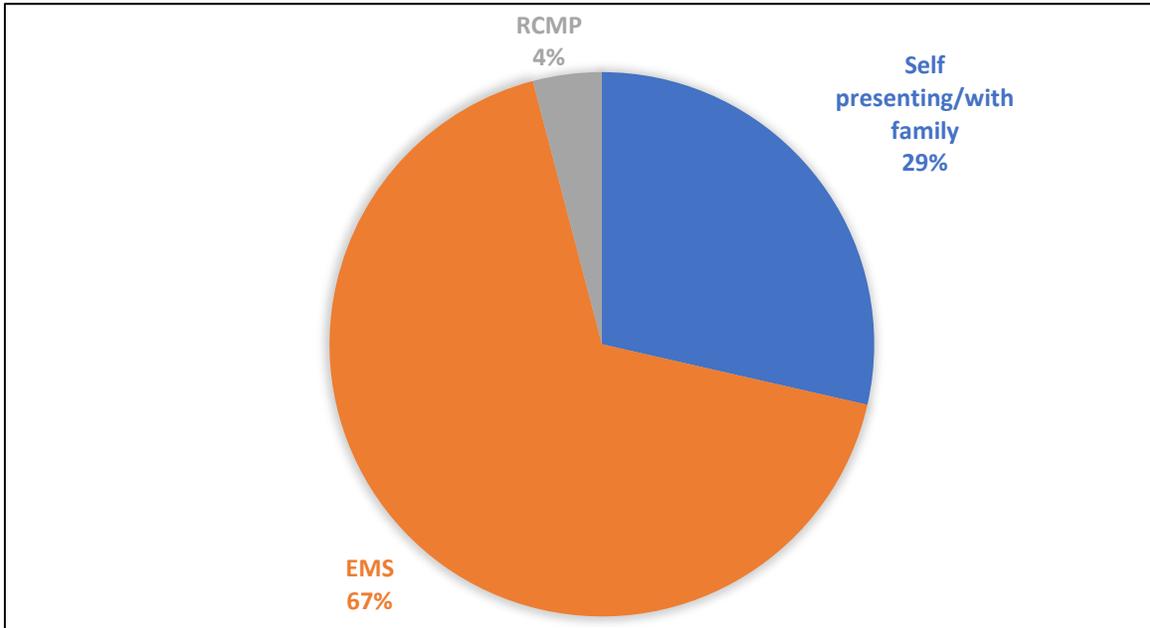
Patient's in our sample were triaged in the ED at various times throughout the day (M=14:23, SD=0.265).

Patients presented on every day of the week, with a predominance for presenting on Thursday, Sunday, and Monday (Figure 3). There was no significant difference between the number of drugs patients consumed on weekdays and weekends ( $t=1.52, df=48, p=.135$ ) or the use of illegal drugs between weekdays and weekends ( $t=0.280, df=48, p=.780$ ). While not statistically significant, alcohol was found to be more likely consumed during drug overdoses on weekends ( $t=1.921, df=48, p=.061$ ).



**Figure 3.** Day of the week that patients presented to the Selkirk Emergency Department with substance abuse related concerns between April 2017 and March 2018. N=50.

Patients arrived to the ED primarily through EMS (Figure 4). There was no significant relationship between the type of drugs people consumed and their mode of transportation to the ED ( $F=1.80$ ,  $df=6,43$ ,  $p=.122$ ).



**Figure 4.** Percentage of patients that arrived at the Selkirk Emergency Department themselves or accompanied by family, with EMS, or with the RCMP.

Eighteen charts did not contain information regarding whether this was the patients first substance abuse presentation. In the remaining 32 charts that did mention whether this was a first or recurrent presentation, 22 individuals were presenting to the ED for at least their second time. Only 3 charts contained a record of how long the patient was in the ED, and thus this data was not analysed. 5/50 patients were admitted to hospital.

Patients vital signs including systolic blood pressure (BP), Glasgow Coma Scale score (GCS), and heart rate (HR) are shown in Table 2.

**Table 2.** Mean vital signs measured at triage of 50 patients presenting to the Selkirk Emergency Department with substance abuse related concerns.

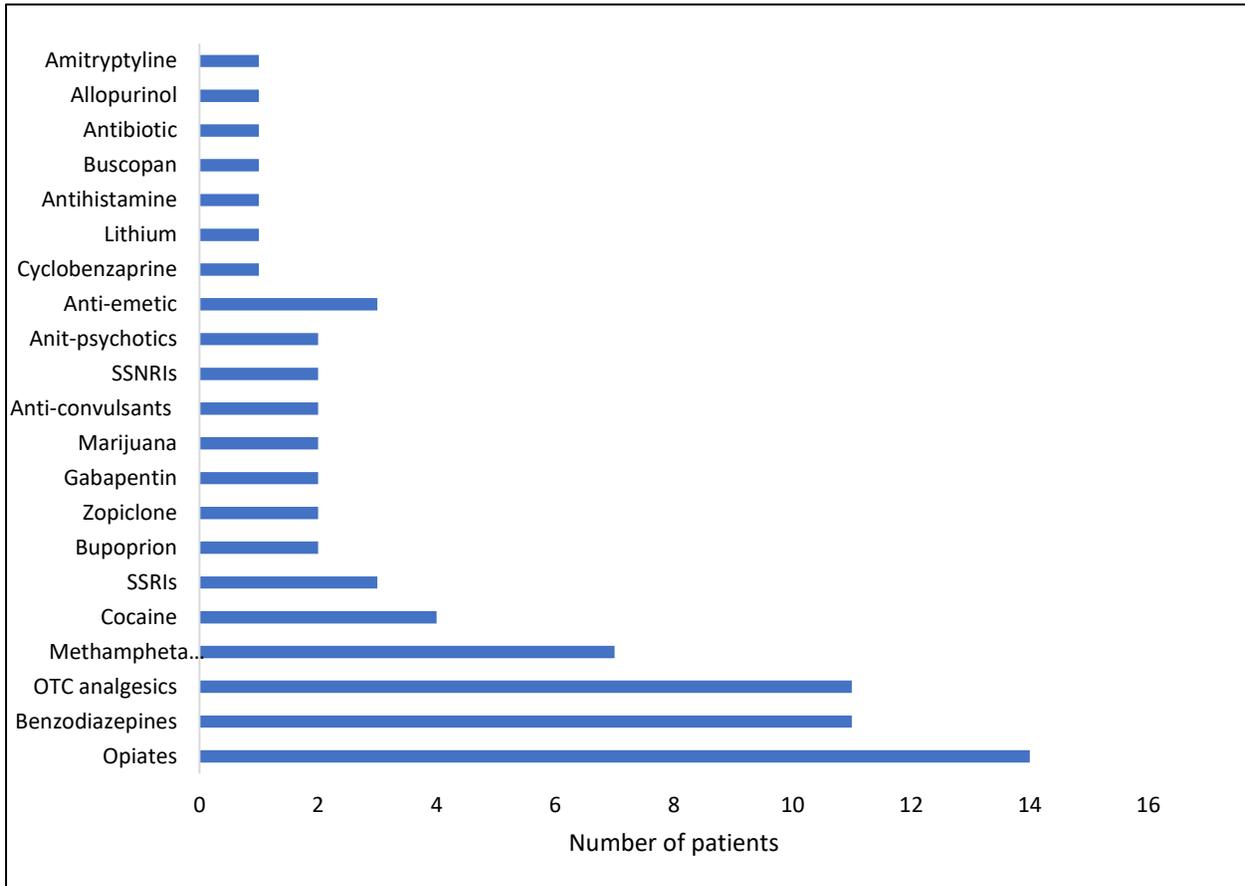
<b>Vital Sign</b>	<b>Mean (SD)</b>
<b>Systolic BP</b>	123.93 (21.80)
<b>Heart Rate</b>	98.81 (24.63)
<b>Glasgow Coma Scale</b>	14.42 (1.58)

*Past medical history*

Twenty-four patients had a history of depression, 20 a history of anxiety, 6 had hypertension, 4 had liver disease, and 3 had Diabetes Mellitus. The strong correlation between anxiety and depression (Pearsons  $R=.686$ ,  $p=.000$ ) showed that patients who presented with anxiety were also likely to have depression.

*Substances abuse*

Among the 50 patient charts reviewed there was a wide variety of drugs consumed, with the most commonly abused drugs being opiates, benzodiazepines, over-the-counter (OTC) analgesics, methamphetamines, and cocaine (Figure 5).



**Figure 5.** Complete list of drugs abused by 50 patients who presented to the Selkirk Emergency Department between April 2017 and March 2018.

Based on the results, further analyses were completed for opiate, benzodiazepine, methamphetamine, OTC analgesics, and cocaine consumers. Table 3 below shows the results of tests examining whether there was a relationship between a history of depression/anxiety and the drug consumed. Correlation analyses also showed no significant correlation between any particular drug consumption and depression or anxiety. There was no significant relationship between depression or anxiety history and the type of drug consumed.

**Table 3.** Results of t-tests completed to examine the relationship between consumption of opiates, benzodiazepines, OTC analgesics, methamphetamines, cocaine and depression and anxiety.

<b>Drug class</b>	<b>Depression</b>	<b>Anxiety</b>
Opiates	$t=.864, p=.392$	$t=.965, p=.339$
Benzodiazepines	$t=-1.17, p=.249$	<b><math>t=-2.63, p=.011</math></b>
OTC analgesics	$t=-.483, p=.631$	$t=.273, p=.786$
Methamphetamines	$t=1.42, p=.162$	$t=.154, p=.878$
Cocaine	$t=-1.12, p=.269$	$t=-1.49, p=.142$

*Reasons for overdose*

For 12/50 patients there was mention in the chart that their overdose was a suicide attempt and in an additional 4 charts it was noted that the patient clearly was aiming to self harm. Thirty charts showed that the ED physician had consulted a mental health specialist. Many individuals had decided to overdose as a result of a failure to cope with a certain situation, be it a fight or a recent family circumstance.

**Discussion**

Prior to data collection it was expected that most drug overdoses would be of illicit drugs and opioids. In this study we found that many of the drug overdose presentations to the Selkirk Regional Health Centre ED were for prescription drugs, or over the counter medications. Opioid use has received national media attention, but in our study, they did not constitute the majority of the drugs taken. In fact, opioids, methamphetamines, cocaine and marijuana together did not equal the majority of drugs consumed (Figure 5). Out of the 75 drugs taken by our population of 50 persons, 27 were opioids or illicit drugs (methamphetamines, cocaine, marijuana), while 48 were other classes of medications either prescribed, or over-the counter. This may indicate that efforts to rehabilitate opioid addicts and educate prescribers has been improving, and that there may be less available opioids available for mis-use. Our study results suggest that in the Interlake region over the counter analgesics and benzodiazepines are a common source of overdose. This

may be because over-the-counter medications are readily available and that individuals requiring anxiety-reducing medications like benzodiazepines are more susceptible to behaviour leading to overdose.

We expected to have seen a high prevalence of drug overdose mixed with alcohol use during social situations. Our results showed that most individuals took drugs in isolation, and that their motives for taking the drugs, was not from social gatherings, but instead may be due to suicide intention.

Our data analysis did not yield statistically significant results. This is likely because 50 charts was not a sufficient number of charts to yield significant data. With a wide range of patients, who had consumed a variety of different illicit, prescription, and over-the-counter drugs, it was difficult to draw conclusions. If we had been able to select charts of patients who had only consumed 1 class of drug we may have been able to better determine if there was a wide variety in ways patients were treated in the ED. Regardless of the drawbacks to this study, this preliminary review of ED charts, may be useful as a framework for how to review future charts at the Selkirk Regional Health Center and more charts may be gathered if the IERHA and hospital staff believe it to be of value.

Despite the lack of statistical significance, many interesting trends were observed. The average age of the selected patients was 33.6 years and the median and mode were 27 years and 19 years respectively. Previous studies have shown that individuals in the 20-34 age bracket were most at risk of presenting to the ED due to drug overdose.<sup>2,3</sup> We suggest that in our sample, young adults may present more frequently as they may be at higher risk of mental illness. Many of those who presented to the ED also had a documented history of anxiety, depression, or both

(24 patients had a history of depression and 20 had a history of anxiety, with a large likelihood of having depression concurrently with anxiety).

This study was only interested in adult presentations, but we excluded several charts of people under 18 years of age. The number of younger individuals struggling with addiction may suggest that education on coping skills and strategies needs to be more thoroughly evaluated in the region's school curriculum to help youth that are struggling.

Additionally, there appears to be a gap in community resources regarding concurrent addictions and mental health management. While there are resources for both addictions and mental health in the region, it was noted that many individuals would be directed to only one stream dependent on what they presented with. It was noticed that individuals who presented with illicit drug overdose would be directed to the addictions stream, whereas those who presented more with a mental health crisis or suicide attempt with the use of non-illicit drugs would be directed towards the mental health stream. However, many of those who had presented with illicit drug overdose, also had documented mental health illness or concerns. The Interlake Eastern Regional Health Authority may want to consider ways of integrating addictions and mental health system resources in the future.

We initially planned on examining treatment methods of overdose in the ED to determine if a protocol could be developed to guide physicians in the treatment of illicit drug overdoses similar to developed guidelines for alcohol withdrawal. However, a set of guidelines is difficult to develop when various factors including the amount of drugs, type, and individual patient's demographics and state influence treatment and care.

Our study demonstrated that a plethora of drugs are overdosed in the Interlake region by patients living in Selkirk and surrounding smaller communities. Despite current media attention

focusing on opioid use, we should equally be concerned regarding the number of over the counter medication overdose presentations. Future research should consider focusing on ED presentations for one type of drug class (ex. Over-the-counter analgesics) to further understanding of the patient population prone to a type of overdose and thus be able to better tailor their care.

## References

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2. O'Connor, S., Grywacheski, V. & Louie, K. (2018). Hospitalizations and emergency department visits due to opioid poisoning in Canada. *Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice*, 38 (6), 244-247.
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