Delirium Treatment Guideline Adherence in the Selkirk Regional Health Centre

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Background

Delirium is an acute change in mental state often characterized by fluctuating course, inattention, disorganized thinking, and an altered level of consciousness.[1] The onset for delirium is typically short, hours to days as opposed to weeks, months or years, which aids in differentiating it from other causes of altered mental state such as dementia or depression.[1] Delirium can be caused by a myriad of things, including drugs, alcohol withdrawal, infection, and sensory or environmental abnormalities.[2] Patients with an underlying severe medical condition or dementia may develop delirium more easily than otherwise healthy patients.[2] The vast majority of delirium cases involve elderly patients.[2]

Delirium is a serious medical emergency, and should be recognized and reversed as soon as possible.[3] Compared to their non-delirious counterparts, delirious patients have poorer outcomes, and a higher mortality rate, even when controlling for other medical conditions and pre-existing dementia.[3] Despite its dangerous and emergent nature, delirium is often reversible, which is why relatively strict adherence to established guidelines for treatment is essential.[2] Adhering to the currently accepted guidelines and correcting an underlying cause if possible, increases a patient's chance for a full recovery.[2]

The *Canadian Coalition for Seniors' Mental Health (CCSMH) National Guidelines: The Assessment and Treatment of Delirium*, the current national guidelines, have many suggestions for how delirium should be assessed, prevented, and treated both non-pharmacologically, and pharmacologically.[2]

Patients at risk for delirium would ideally receive preventative measures such as adequate pain control, maintaining sleep patterns, and providing reorientation.[2] However, some of these measures are not always taken, nor are some feasible in a busy hospital ward environment. When delirium does occur, it is important to identify it as soon as possible.[2] Most commonly this is using the Confusion Assessment Method (CAM) as a screening tool for the development of delirium.[2] There are three primary subtypes of delirium discussed in the current national guidelines; hyperactive, hypoactive, and mixed.[2] Hyperactive delirium is characterized by restlessness, agitation, hyperawareness.[2] Patients with hyperactive subtype are more likely to experience psychotic symptoms.[2] Patients with the hypoactive subtype have symptoms such as lethargy, drowsiness, and may seem sedated.[2] The mixed subtype of delirium, are likely to have a mix of hyperactive and hypoactive symptoms.[2]

After the confirmation of delirium, treatment should be started promptly, which includes attempting to identify a precipitating factor, treating that factor if identified, as well as non-pharmacological and pharmacological management as needed.[2] Non-pharmacological measures include, but are not limited to, modifying the environment to reduce agitation, and avoiding sensory deprivation.[2] Pharmacological treatment, if needed, often includes the use of antipsychotics such as haloperidol or atypical antipsychotics.[2] In the absence of troubling psychotic symptoms, it is recommended that hypoactive delirium not be treated with psychotropic medications, and instead be reserved for the hyperactive or mixed subtypes.[2] It is important to note that benzodiazepines should generally be reserved for the treatment of benzodiazepine or alcohol withdrawal delirium, as they can exacerbate or independently cause other forms of delirium.[4] In a 2006 study by Pandharipande et al. the use of Lorazepam in

mechanically ventilated patients independently increased the odds ratio of a patient transitioning to delirium.[4] Additionally, the use of medications with anticholinergic action are not recommended in delirious patients, as drugs with anticholinergic effects are one of the most common instigating classes for drug induced delirium.[5]

Methods

As previously discussed, the assessment and non-pharmacological management of delirium are integral to care of delirious patients, however for the purpose of this investigation, we have opted to focus our investigations on the pharmacological treatments undertaken. This is largely due to practicality. Non-pharmacological measures to manage delirium, such as in-room orientation like the presence of a calendar, or encouraging regular sleep patterns, are often not charted in progress notes, thus making it difficult to retrospectively analyze whether these measures were put in place.[2] Thus, we will focus on analysis of pharmacological therapy given to delirious patients.

75 charts noting the progress of delirious patients were retrieved from the Interlake East Regional Health Authority (IERHA) archives. 30 charts were ultimately excluded from analysis due to factors such as the elevated length of hospital stay, lack of chart completion, and whether or not the patient died in facility. Each of the above factors would have made a thorough examination of the progress notes difficult, resulting in their exclusion from analysis.

The 45 selected patient's charts were then reviewed for basic information such as their age, length of stay, and discharge disposition. Following that, charts were assessed for several key data points based on the current Canadian guidelines for delirium treatment.[2] Information found within the charts included if cause for the delirium was determined and treated, the type of delirium, the use of benzodiazepines, and the use of anticholinergics. Additionally, we documented the use of any antipsychotic medications, and whether or not they were the recommended first line treatment.[2] See Appendix A for a full list of questions.

Following the chart review, the questions within Appendix A were collected and analyzed to determine whether the Selkirk Regional Health Centre (SRHC) is regularly meeting or deviating from the current accepted delirium treatment guidelines.[2] This information was then used to create targeted recommendations on how SRHC can improve inpatient delirium management, so that it more closely reflects the current standard of care. Additionally, this data was used to create a set of posters focused on correcting certain inappropriate delirium treatment strategies that were used in the SRHC.

Results

The mean age of patients whose charts were included in analysis was 82.3 ± 8.66. The average length of hospital stay was 12 days ± 7.9. The latter number is likely an inaccurate sample due to the fact that patients with stays exceeding 30 days were excluded from this review based on the difficulty of reviewing a high volume of charted progress notes.

The cause of delirium was successfully identified in 88.89% of cases. If the precipitating factor was found, there was an attempted targeted treatment or reversal 100% of the time. Of the identified causes, infectious was the most common at 64.44% (29 patients). Medication induced delirium was present in 13.33% (6 patients), and delirium was attributed to withdrawal in 4.44% of cases (2 patients). Only one patient's delirium (2.22% of sample) was attributable to an electrolyte disturbance. Finally, 13.33% of cases (6 patients) had delirium of undetermined cause.

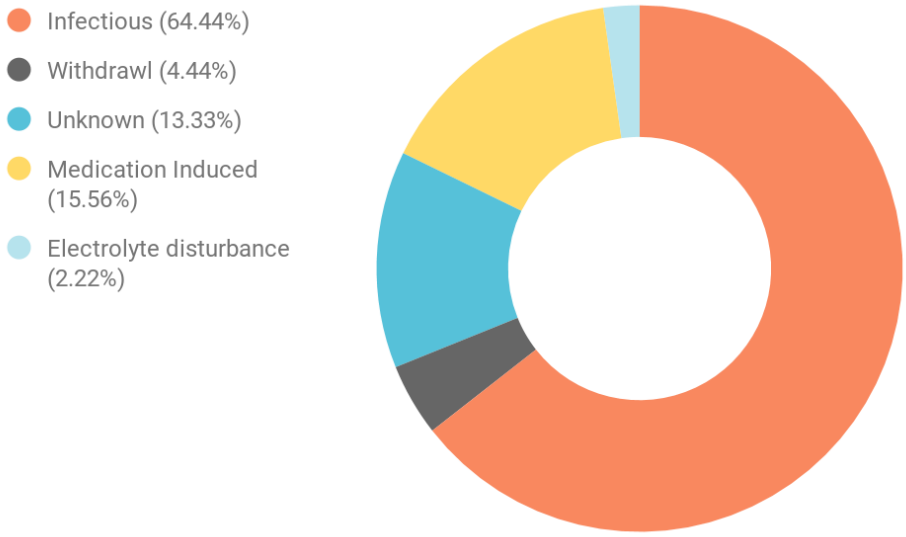

Figure 1. Delirium Etiology in 45 inpatients diagnosed with delirium in the SRHC as gathered from discharge summary, admittance summary, or progress notes of respective patient charts.

Delirium subtypes were identified in all 45 cases. The most common subtype was hyperactive delirium, at 42.22% (19 patients). Hypoactive delirium was diagnosed in 35.55% (16 patients), and mixed delirium was diagnosed in 22.22% (10 patients) of cases.

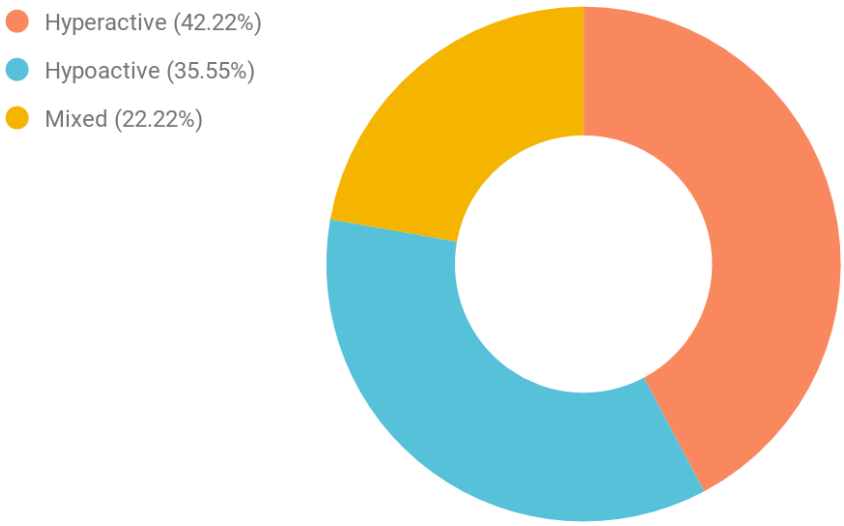

Figure 2. Delirium subtype of SRHC patients diagnosed with delirium, as obtained from relevant chart progress notes.

Of the 19 patients with hyperactive delirium, 13 were treated with antipsychotics. The current Canadian guidelines suggest that hypoactive delirium not be treated with psychotropic medication unless clear psychosis is present, however in 25% of cases with hypoactive delirium antipsychotics (either haloperidol or an atypical antipsychotic) were used, despite having no psychotic symptoms.[2]

Agitation symptoms were often treated with a combination of benzodiazepines and atypical antipsychotics. Benzodiazepines were used in 35.56% (16 patients) of delirious cases reviewed; being exclusively used in 8.89% (4 patients) cases. Atypical antipsychotics were used in 51.11% of cases; it was used exclusively in 20.0% (9 patients) of cases. 26.67% (12 patients) received both.

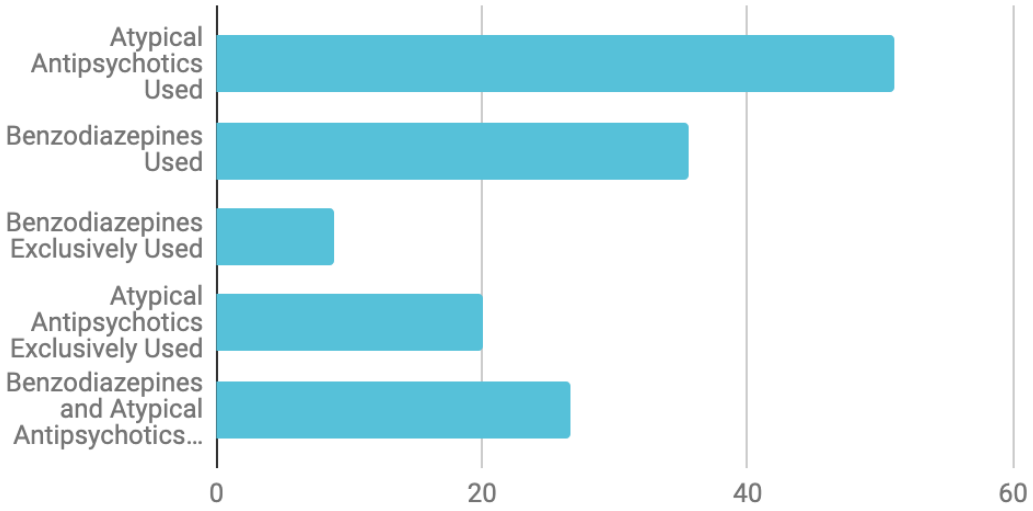

Figure 3. Percentage of patients treated with atypical antipsychotics and/or benzodiazepines, as reviewed in order sheets of pertinent patient charts.

Upon discharge, 55.56% of patients (25 patients) were able to be sent home with some additional supports, such as home care. 11.11% (5 patients) were sent home with no additional supports in place. The second largest group, at 26.67% (12 patients) was transferred to another inpatient facility for further management. Only 4.44% (2 patients) were discharged to residential care, and a single patient left against medical advice (2.22% of sample).

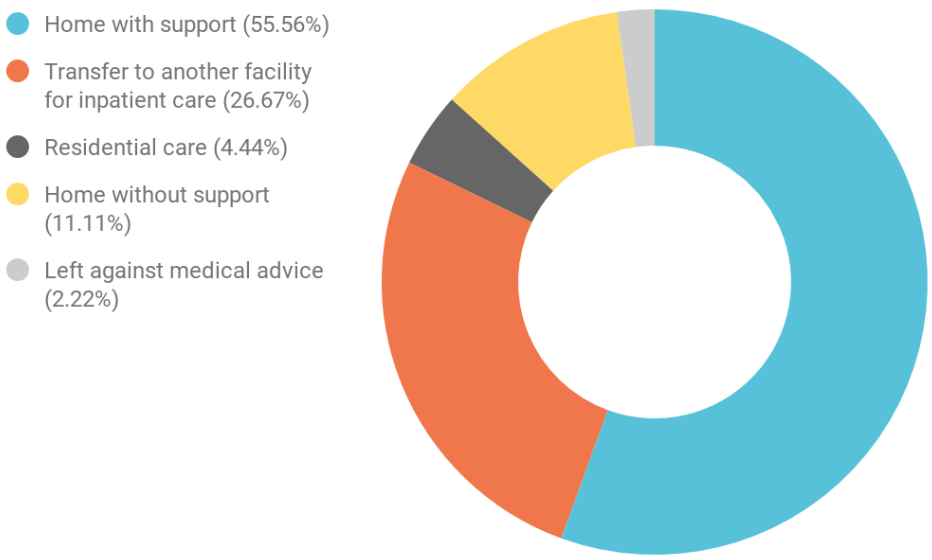

Figure 4. Discharge disposition of formerly delirious patients from the SRHC, as stated in the discharge summary of reviewed charts

The Interlake East Regional Health Authority (IERHA) uses standardized admission order forms that have 'Dimenhydrinate as needed' as a checkbox within this document, which resulted in many patients having prn orders for dimenhydrinate, without any actual doses being administered during their stay in hospital. Recognition of this discrepancy led to two key research questions regarding anticholinergics such as dimenhydrinate:

Were anticholinergics prescribed within 48 hours of the onset or resolution of delirium?

Were anticholinergics used within 48 hours of the onset or resolution of delirium?

Of the 45 patients included in this study, 31 patients received a prn prescription for some kind of anticholinergic medication and 22 were given doses of anticholinergics within 48 hours of the

onset or resolution of delirium. All patients that received anticholinergics were given dimenhydrinate, 6 patients of which also received additional anticholinergic medications.

Discussion

The results of this analysis indicate that SRHC does an excellent job of adhering to some of the current Canadian guidelines on the management of delirium, while consistently falling short in other key areas.[2] Additionally, there are many parts of the guidelines that were not reviewed in this paper, which presents opportunities for further investigation. With this study it is our hope to improve patient care by recommending SRHC adopt several delirium guideline standards.

SRHC consistently investigated the provoking cause for delirium. The cause was discovered 88.89% of the time, and appropriate targeted treatment was attempted 100% of the time once the cause was discovered. This performance aspect is excellent, since quick and effective treatment of the provoking cause of delirium is one of the main management efforts.[2] However, it must be noted that during review of charts for this study, a clear diagnosis was often rare and there was more uncertainty than the statistics demonstrate. It is probable to assume cases of delirium were misdiagnosed and/or attributed to a single cause when in fact there were several confounding issues all causing deterioration of the patient.

Additionally, in terms of antipsychotic use, haloperidol or first line atypical antipsychotics such as olanzapine, quetiapine, and risperidone, were used exclusively in the

treatment of delirium.[2] This adheres to national treatment guidelines, which states that haloperidol and atypical antipsychotics are first line for treatment of hyperactive delirium, or hypoactive delirium with concerning psychotic features.[2]

In terms of selecting antipsychotics, even though SRHC consistently administered either haloperidol or first line atypical antipsychotics, the dosing of haloperidol was often significantly outside of the dose recommended by the Canadian guidelines.[2] Several patients had prescriptions for Haloperidol 5mg q4h prn either IM or IV as their first dose, whereas the guidelines suggest starting at Haloperidol 0.5mg to 1.0mg od-bid, with a daily maximum dose of 5mg to control even severe delirium in the elderly.[6] Based on these recommendations, we believe SRHC would do well to consider a lower initial dose of haloperidol, with escalation as needed to control agitation.[2,6]

In other key areas identified in the Canadian guidelines for delirium treatment, SRHC falls short.[2] The treatment of hypoactive delirium without psychotic symptoms with antipsychotics is currently not recommended.[2] Yet, at the SRHC, hypoactive delirium was treated with an antipsychotic 25% of the time. There is further study needed in this area to see if there are adverse events from this un-needed intervention. A more appropriate treatment for hypoactive delirium would be adequate pain control, and environmental factors that aid in re-orientation.[2]

Medications with anticholinergic properties are a concern in elderly patients, and particularly those with delirium. This class of medication has been shown to be dangerous in even the healthy older adults and alternatives should be favored when possible.[8] The Beers

Criteria, a guideline adopted by the American Geriatric Society, lists anticholinergics as a drug to be avoided, stating that the risk of the medication outweighs the benefits, specifically due to its ability to induce confusion.[9] It lists the strength of the recommendation as strong and quality of evidence as moderate.[9] The caveat being that in some individuals, the drug may be unavoidable and thus the risk necessary.[9] However, cases in which practitioners prescribe anticholinergics to elderly should be exceptions, not the norm.[2] Each case should be looked at individually, and the specific risks and benefits to that patient properly weighed.

The current admission order at SRHC has dimenhydrinate prn as a check box in the standard admission order set. Only requiring a ticked box to prescribe. This led to almost every patient having an anticholinergic available to them prn and 35.56% (16) patients receiving dimenhydrinate within the period around their delirium. Due to anticholinergics' ability to induce or increase confusion and delirium in the elderly, they are ideally avoided in a high-risk population.[2,9] We therefore recommend that dimenhydrinate be removed from the standard admission order set for elderly patients (patients over 65 years of age). In its place, a non-anticholinergic anti-nausea medication, such as Ondansetron, be added. If complete removal of dimenhydrinate from elderly patient order forms is a hurdle, a non-anticholinergic option should be added to encourage physician contemplation regarding whether dimenhydrinate is an appropriate order for their patient. This is a simple change that could drastically reduce the amount of common anticholinergic drugs being routinely prescribed to high risk patients.

Lastly, benzodiazepines were consistently employed in delirious patients, despite the risk of exacerbating delirium.[2] According to the Canadian delirium guidelines, benzodiazepines

can exacerbate delirium and should be avoided while treating delirium.[2] Currently, the only time benzodiazepines are indicated and necessary during the treatment of delirium is in the case of alcohol/benzodiazepine withdrawal.[2] In one study by Pandharipande et al, lorazepam as an independent risk factor was shown to increase the risk of delirium by up to 20%.[4] Furthermore benzodiazepines have also been shown to be ineffective at treating delirium when compared to 1st and 2nd generation antipsychotics like haloperidol and quetiapine.[7] Out of the 45 patients included in this study, 16 (36%) of them were treated with benzodiazepines (mainly lorazepam) during the course of their delirium and 4 (9%) patients were solely treated with benzodiazepines. These results are cause for reflection as none of the current guidelines reviewed for the purposes of this study recognize benzodiazepines as appropriate treatment for delirium, except under a few specific circumstances.[2] We therefore recommend that SRHC avoid using benzodiazepines in patients with delirium except in withdrawal type scenarios.[2]

The aforementioned goals could be achieved through staff education in the form of a grand rounds on the topic delirium given by a specialist in the field. Additionally, a new standard order set could be created for delirium and automatically added to charts of all patients at risk for developing delirium. This order set would include things such as non-pharmacologic means to prevent and respond to delirium, medications to avoid such as common anticholinergics and benzodiazepines, and escalating dosing for haloperidol and 2nd generation antipsychotics.[2] This order set would involve multiple team members including the attending physician, nursing staff, and health care aids which would result in an interprofessional and coordinated response to combat the issue of delirium and better standardize treatment.

Conclusions

The current Canadian national delirium treatment guidelines outline best practice for caring for delirious patients.[2] Treatment guidelines are key, due to the fact that delirium increases morbidity and mortality.[3] SRHC does a good job of meeting some of these guidelines, however the facility falls short in other key areas. The precipitating cause for delirium was regularly investigated and directly treated. However, there was an overuse of benzodiazepines, a concerning penchant for prescribing anticholinergic medications which increase the risk of delirium in the elderly, and an overuse of antipsychotic medications in delirious patients with hypoactive subtype.[2] In order to ameliorate these discrepancies, we recommend the removal of the dimenhydrinate prn order on standardized admission paperwork for patients over 65 or otherwise at high risk for delirium. We discourage the use of benzodiazepines as a sedating agent in patients at risk for delirium, or actively delirious, as it has poor treatment efficacy and is a predisposing factor for delirium.[2,4,7] We also recommend a lower initial haloperidol dose, that is in line with current national and international guidelines, than what is commonly used in the SRHC.[2,6] Finally, we discourage the use of antipsychotics in hypoactive delirium without concerning psychotic symptoms, however there is more research needed in this area.[2]

Recommendations Summary

- Avoid antipsychotics in the setting of hypoactive delirium without psychotic features.[2]
- Initial haloperidol doses should be started in the range of 0.25 - 1.0 mg po od-bid and escalated as needed.[2,6]
- Benzodiazepines should not be used in the treatment of delirium, except for delirium caused by alcohol or benzodiazepine withdrawal.[2,4,5,7]
- Medications with anticholinergic effects should be avoided in patients over 65 due to deliriogenic effects.[2,8,9]
- Removal of dimenhydrinate prn from the standard admission order set.
- New standardized delirium specific order set added to all patients at risk for delirium to aid in a more standardized approach to care.

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Appendix A

Research Questions
Patient age at time of admission
Length of stay in SRHC
Discharge disposition
Was the cause of the delirium discovered?
If the cause was discovered, was it treated/attempted treatment?
Delirium subtype
Delirium etiology
Were antipsychotics used?
Was Haloperidol used?
If Haloperidol was used, what was the dose and route?
Was an atypical antipsychotic used?
Were benzodiazepines used within 48 hours of delirium onset?
Were anticholinergics used within 48 hours of delirium onset?
Were anticholinergics prescribed within 48 hours of delirium onset?