PREVENTION AND MANAGEMENT OF DELIRIUM

Getting Started Kit
Safer Healthcare Now!

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This Getting Started Kit has been written to help engage your interprofessional/interdisciplinary teams in a dynamic approach for improving quality and safety while providing a basis for getting started. The Getting Started Kit represents the most current evidence, knowledge and practice, as of the date of publication. We remain open to working consultatively to update the content as more evidence emerges, as together we make healthcare safer in Canada.

Note:

The Getting Started Kits for all Safer Healthcare Now! interventions are available in both French and English.

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Background

Goal
The goal is to improve care of the critically ill patient through implementation of standardized screening and prevention and management strategies for delirium.

The Case for Preventing and Managing Delirium in the ICU
Delirium is an under-recognized, but surprisingly common problem in hospitalized ICU patients. Up to 80 per cent of critically ill patients from various ICU populations can be identified as having delirium or sub-syndromal delirium according to validated screening criteria. In addition delirium is associated with worse outcomes such as increased length of stay and ventilator-days, long term cognitive dysfunction, self-removal of important devices (endotracheal tubes, central venous catheters) and mortality. The pharmacologic treatments (e.g., antipsychotics, sedation) used to manage delirium are associated with risks as well.

The identification and management of delirium is complex. Improved outcomes are noted when ICU teams utilize a structured approach for the administration and titration of sedative, analgesic and antipsychotic medications. As a result of this improved approach, teams can expect to better identify the appearance of delirium and modifiable factors, to decrease the use of unnecessary medications and a reduce length of stay with the potential of improving ICU access for other critically ill patients.

Accreditation Canada has included delirium in its accreditation process: Accreditation Standard 10.9: “The team uses a delirium screening tool to assess clients for delirium. Delirium, a heightened state of agitation, contributes to increased length of stay and may cause clients to self-extubate or remove catheters. The team identifies and consistently applies a delirium screening tool.”

Prevention and Management of Delirium
Delirium is a syndrome characterized by a disturbance of consciousness and a change in cognition that develop over a short period of time. Delirium affecting ICU patients is complex and still poorly understood.

The most important step in delirium management is early detection. This can support ICU teams by alerting them to changes in physiological status. The converse is particularly relevant, (e.g. delays in identifying delirium may delay identification of important changes in critical illness), with its known consequences on patient outcome (e.g., infection). In addition, the decision to initiate or titrate medications (for example, analgesia, and sedation) depends on accurate assessment of delirium. Without appropriate cognitive status information, treatment will not match the needs of the patient.
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Three major delirium screening tools have been utilized: the Nursing Delirium Screening Scale, Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) and Intensive Care Delirium Screening Checklist (ICDSC). Although the CAM-ICU and ICDSC vary in their approach, the CAM-ICU provides a yes-no syndrome recognition, whereas the ICDSC grades the syndrome to include a range of “subsyndromal delirium”. Both have been validated in ICU patients and been successfully used in delirium screening and management.4,5,6

If delirium is detected, efforts should focus managing the symptoms while identifying the cause and minimizing the impact of risk factors. When these efforts are unsuccessful patients are treated with psychoactive medications. Unfortunately, the pharmacologic management of delirium is far from straightforward, and in need of much work to improve our understanding of this syndrome and its response to various medications.

Delirium Change Package

Recognize/manage/mitigate risk factors (prevention and reduction strategies) for every patient

- Identify pre-admission risk factors - hypertension, alcohol consumption, APACHE II scores (very sick), cognitive impairment. AGE and GENDER are NOT factors for ICU patients (these are different than those admitted to the ward), use the ICU criteria not the ward criteria.

- Manage sedation: the Society of Critical Care Medicine (SCCM) guidelines7 propose minimizing sedation wherever possible. When not possible, daily sedation interruption and daily awakening, spontaneous breathing trials, and use of sedation scales may be considered.8

- Manage the environment: visible daylight, discuss social supports, allow visitors, display calendar and clocks in the room, use of TV with favourite shows, talk with the patient, observe sleep-wake cycles, allow familiar objects and family supports, avoid restraints.

- Communicate the balance between comfort with harm reduction to all staff (e.g. more drugs may mean increased risk), empower nurses with the tools to balance these.

- Target risk factors: impaired cognition & functional status, sensory impairment, psychoactive drug/ETOH use).

- Optimize orientation and mobilization interventions (practice early mobilization), titration of analgesic, sedative and psychotropic medications, normal sleep, physiological homeostasis, appropriate communication methods.

- Use general education strategies for staff on precipitating factors, impact of delirium on patient outcomes, length of stay and mortality, differentiate between pain & need for sedation.
• Stop (meds) and THINK (Toxic Situations, Hypoxemia, Infection/sepsis nosocomial, immobilization, non-pharm interventions [hearing aids, glasses, reorient, sleep protocols, noise control, ambulation], K+/electrolyte problems).

**Assess for Delirium (every shift and as required)**

• Use a delirium screening tool based on DSM-IV criteria to make diagnosis for delirium for patients awake and conscious, ensure that definitions are clear and agreed to, use as diagnostic criteria.

• Use tools validated for ICU: Intensive Care Delirium Screening Checklist (ICDSC) or Confusion Assessment Method Intensive Care Units (CAM-ICU).

• Screen for alcohol withdrawal separately (e.g. CIWA-AR Clinical Institute Withdrawal Assessment Scale for Alcohol).

• Add delirium screening to daily tasks (e.g. daily goals, link with treatment strategies as a seamless process).

• Empower ICU nurses with screening tools.

• Improve communication from nurses to medical staff (e.g. put delirium into words, document delirium score into patient chart, have nurses discuss on rounds).

• Integrate screening into current documentation and communication processes.

• Use scenario-based education (use stories, case studies, discussion in small groups).

• Use teaching models that incorporates uncertainty, rather than ignores it.

• Go on rounds with physicians, have pharmacist and nurse, institute multi-disciplinary rounds.

• Identify natural team leaders, disseminators of new skills and knowledge and peer experts.

• Change focus of discussions: we are managing delirium without trying to “fix it”.

**Document compliance with standardized protocol for management of delirium**

• Identify and vigorously reverse, manage, mitigate underlying causes and risk factors for delirium.

• Use non-pharmacological strategies.

• Use environmental strategies.

• Use pharmacological strategies appropriately and only after underlying causes addressed.

• Have clear plan for withdrawal of anti-psychotics (before transfer to ward and/or other location).
Support patients and families of patients with delirium (integration of family)

- Include educational (cognitive), contextual, emotional support.
- Ensure family receives information about delirium.
- Create education strategy for families (e.g. pamphlets *Delirium Education for Families* and *Depliant* by Dr. Y. Skrobik for the Hopital Maisonneuve-Rosemont).*
- Create and communicate concrete memories of actual events to increase patient’s ability to question the memories of delusional events (i.e. often delusional events are a mix of fact and fiction, help patient distinguish between the two).
- Hear patient’s stories about their experience in the ICU.
- Re-think and carefully deal with patient autonomy - a delirious patient may not in best position to make decisions about their care.
- Educate families on the impact and importance of their role in managing delirium.
- Practice kindness and compassion: talk quietly, touch, and break through the delusions.
- Debrief with patients and families to prevent post-traumatic stress.
- Manage the stigma.

Consider others to be part of same system

- Work with psychiatry, physiotherapy, pharmacy, respiratory therapy, occupational therapy and social workers.

Change work environment

- Assess current practices, track incidence of delirium.
- Link delirium screening with protocols and treatment strategies.
- Standardize the priority of non-pharmacologic versus pharmacologic strategies.
- Empower frontline staff with tools and knowledge to identify and manage delirium.
- Institute case rounds between ICU and Psychiatry to raise awareness of delirium.

Standardize clinical processes

- Bundle environmental prevention/management strategies and track compliance to the bundle (all or none).
- Use delirium management protocols.
Additional Evidence Based Components of Care

Practices That Promote Patient Mobility and Autonomy
The deleterious effects of ICU-acquired delirium and neuromuscular weakness on patient outcomes are well-known. These two complications of critical illness are highly prevalent in a mixed ICU population, but go more often unrecognized than other ICU-acquired organ system failures despite being associated with increased ventilator, ICU and hospital days and mortality.\textsuperscript{10,11,12}

Recent data support practices that help mitigate

Choice of Sedatives, Analgesics and Antipsychotics
Clinically, improper use of sedatives and narcotic analgesics may increase the risk of delirium, and conversely, the decision to initiate or titrate these medications depends on accurate assessment of delirium. For a variety of reasons, the critically ill ventilated ICU patient is at increased risk of adverse events related to sedative, analgesic, and antipsychotic therapy. These events are complex and require knowledge, vigilance and strategies to prevent or minimize them.\textsuperscript{13}

Conversely, improved outcomes are noted when ICU teams utilize a structured approach to sedation and analgesia administration and titration.\textsuperscript{14} Despite the limited literature on the use of antipsychotics for ICU delirium, there is evidence that a standardized approach to sedation, analgesia and mobility that incorporates delirium to these modalities can positively affect clinical outcomes.\textsuperscript{15,16,17}

Early Exercise
Progressive mobilization of ventilated ICU patients can be performed safely with successful outcomes.\textsuperscript{18} For more details on early exercise the reader is referred to original papers\textsuperscript{19,20} and to the VAP GSK.\textsuperscript{21}

Recently, Schweickert\textsuperscript{22} combining a protocol to assess readiness for extubation with early exercise and mobilization (physical and occupational therapy) in mechanically ventilated patients. Patients randomized to the early mobility group were three times more likely to return to independent functional status at hospital discharge (primary endpoint, 59 per cent vs. 35 per cent, p=0.02), had noted a shorter duration of delirium (median 2 vs. 4 days p=0.02) and higher functional scores (p=0.05) at hospital discharge in intervention patients.

The link between sedation, delirium, mobilization and ICU was further established by the study led by Needham.\textsuperscript{23} This quality improvement project utilized a similar protocol, sought to improve sedation practices and increase mobilization in a medical ICU. At the completion of the study, there was a marked decrease in prescription for benzodiazepines as well as lower doses of narcotics were given. Accordingly patients were awake and alert on twice as many ICU days and the number of delirium-free days doubled. This study showed that a progressive mobility program using a dedicated multidisciplinary team can effectively improve patient mobility while
decreasing sedative requirements, delirium and ICU length of stay. The latter was also associated with improved ICU access for more ICU admissions when compared to an equivalent time period.

**What changes can we make that will result in improvement?**

Develop a structured and interdisciplinary approach to sedation and analgesia in the ICU. This would involve (non-inclusive list) MDs, RNs, pharmacists, and patient representatives. It would include:

- Values (e.g. maximizing patient well-being while avoiding harm, favour analgesia over sedation and intermittent over continuous infusion delivery), targets and goals.
- Regular and frequent measurement of pain and sedation using validated scales. Use validated scales for these modalities: sedation scale (e.g. Riker, RASS etc.) to avoid over or under-sedation.
- Choice of medications based on clinical evidence for patient-focused outcomes that would be accepted and incorporated into daily care via improvement techniques of implementation and re-evaluation.

Consider implementing a similar approach to delirium and incorporating to that for sedation and analgesia. Assessment of delirium in patients is more reliable at times when the patient is not over-sedated.

Consider starting a multidisciplinary “progressive mobility” group. Its focus is on identifying barriers and opportunities towards early mobilization for all eligible ICU patients.

Concerns: ICU staffing to include full-time physical and occupational therapists with new consultation guidelines.

For intubated/ventilated patients, structure their presentations at rounds such as to broaden the scope to clearly and succinctly include:

a. Target and actual measurements of sedation, analgesia and cognition (delirium).
b. Level of mobility.
c. Current physical, environmental and pharmacologic interventions.
d. Interpretation of current status (assessment of dysfunction, its causes and drivers).
Implementing the Strategies

1. Forming the Team

SHN recommends a multidisciplinary team approach to delirium prevention and management. Improvement teams should be heterogeneous in make-up, but homogeneous in mindset. The value of bringing diverse personnel together is that all members of the care team are given a stake in the outcome and work to achieve the same goal. In ventilator care, the team must include an intensive care physician and should include:

- pharmacist
- registered nurse
- respiratory therapist
- physician
- psychiatrist
- psychologist
- administrator
- other allied health professionals as needed
- data managers and improvement specialists as needed

All the stakeholders in the process must be included, in order to gain the buy-in and cooperation of all parties. For example, teams without nurses are bound to fail. Teams led by nurses and allied health professionals may be successful, but often lack leverage; physicians must also be part of the team.

Some suggestions to attract and retain excellent team members include:

- use data to define and solve the problem
- work with those who want to work on the project, rather than trying to convince those who do not
- schedule meetings in advance with dates/times that are MD friendly
- ensure that meetings are structured (agenda and minutes)
- ensure meetings are managed effectively (attention to time allocation)
- ensure that there is clarity about task delegation and time lines
- engage them in the overall goal
- find champions within the hospital that are of sufficiently high profile to lend the effort immediate credibility

The team needs encouragement and commitment from an authority in the intensive care unit. Identifying a champion increases a team’s motivation to succeed. When measures are not improving fast enough, the champion readdresses the problems with staff and helps to keep everybody on track toward the aims and goals.

Eventually, the changes that are introduced become established. At some point, however, changes in the field or other changes in the ICU will require revisiting the processes that have been developed. Identifying a “process owner,” a figure who is responsible for the functioning of the process now and in the future, helps to maintain the long-term integrity of the effort.
2. Setting Aims

Improvement requires setting aims. An organization will not improve without a clear and firm intention to do so. The aim should be time-specific and measurable; it should also define the specific population of patients that will be affected. Agreeing on the aim is crucial, as is allocating the people and resources necessary to accomplish the aim.

An example of an aim that would be appropriate for Delirium can be as simple as, “Implement processes to screen 100 per cent of all ICU patients for delirium within six months or less.” Teams are more successful when they have unambiguous, focused aims. Setting numerical goals clarifies the aim, helps to create tension for change, directs measurement and focuses initial changes. Once the aim has been set, the team needs to be careful not to back away from it deliberately or “drift” away from it unconsciously.

3. Using the Model for Improvement

In order to move this work forward, Safer Healthcare Now! and the Institute for Healthcare Improvement (IHI) recommend using the Model for Improvement. Developed by Associates in Process Improvement, the Model for Improvement is a simple yet powerful tool for accelerating improvement that has been used successfully by hundreds of healthcare organizations to improve many different healthcare processes and outcomes.

The model has two parts:

- Three fundamental questions that guide improvement teams to:
  1) set clear aims;
  2) establish measures that will tell if changes are leading to improvement, and
  3) identify changes that are likely to lead to improvement.

- The Plan-Do-Study-Act (PDSA) cycle to conduct small-scale tests of change in real work settings — by planning a test, trying it, observing the results, and acting on what is learned. This is the scientific method, used for action-oriented learning.

Implementation: After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the team can implement the change on a broader scale — for example, for an entire pilot population or on an entire unit.

Spread: After successful implementation of a change or package of changes for a pilot population or an entire unit, the team can spread the changes to other parts of the organization or to other organizations.

You can learn more about the Model for Improvement at www.IHI.org. The Canadian Collaborative to Improve Patient Care and Safety in the ICU provides teams with the knowledge and support to successfully implement the model.

4. Getting Started

Hospitals will not successfully implement the Delirium Change Package overnight. A successful program involves careful planning, testing to determine if the process is successful, making modifications as needed, re-testing, and careful implementation.

- Select the team and the venue. Many hospitals will have only one ICU, making the choice easier.
- Assess where you stand presently. Does the respiratory therapy department have a process in place now for ventilator care to prevent pneumonia? If so, work with the department to begin preparing for changes.
- Contact the infectious diseases or infection control department. Learn about your ventilator associated pneumonia rate and how frequently the hospital reports it to regulatory agencies.
- Organize an educational program. Teaching the core principles to the respiratory therapy department as well as to the ICU staff (doctors, nurses, therapists, and others) will open many people’s minds to the process of change.
- Introduce the Delirium Change Package to the key stakeholders in the process.

Setting Aims

Improvement requires setting aims. The aim should be time-specific and measurable; it should also define the specific population of patients or other system that will be affected.

Establishing Measures

Teams use quantitative measures to determine if a specific change actually leads to an improvement.

Selecting Changes

Ideas for change may come from the insights of those who work in the system, from change concepts or other creative thinking techniques, or by borrowing from the experience of others who have successfully improved.

Testing Changes

The Plan-Do-Study-Act (PDSA) cycle is shorthand for testing a change in the real work setting — by planning it, trying it, observing the results, and acting on what is learned. This is the scientific method adapted for action-oriented learning.

5. First Test of Change

Once a team has prepared the way for change by studying the current process and educating the key stakeholders, the next step is to begin testing the Delirium Change Ideas at your institution. Begin using the Delirium Change Ideas with one patient, for one day with one provider.

Teams that are just starting can begin by testing and implementing one component at a time working towards consistently implementing all components of the Delirium Change Package.

- Make sure that the approach is carried over from shift to shift, to eliminate gaps in teaching and utilization.
- Process feedback and incorporate suggestions for improvement.
- Use PDSA cycles to introduce elements of the change package. Engage in subsequent PDSA cycles to refine the process and make it more reliable.

6. Measurement

There is only one way to know if a change represents an improvement: measurement. It is recommended that teams implementing the Delirium Change Package collect data on up to four measures.

7. Track Measures over Time

Improvement takes place over time. Determining if improvement has really occurred and if it is a lasting effect requires observing patterns over time. Run charts are graphs of data over time and are one of the single most important tools in performance improvement. Using run charts has a variety of benefits:

- They help improvement teams formulate aims by depicting how well (or poorly) a process is performing.
- They help in determining when changes are truly improvements by displaying a pattern of data that you can observe as you make changes.
- They give direction as you work on improvement and information about the value of particular changes.
Examples:

1.0 Percentage of Patients Screened for Delirium
2.0 Percentage of Patients Identified with Delirium

**Average % Identified - All Teams**

![Graph showing percentage identified over time](chart1.png)

**Hamilton Health Sciences**

**Compliance-spot audits**

![Graph showing compliance rates over time](chart2.png)
8. Barriers That May Be Encountered

- **Fear of change**
  All change is difficult. The antidote to fear is knowledge about the deficiencies of the present process and optimism about the potential benefits of a new process.

- **Communication breakdown**
  Organizations have not been successful when they failed to communicate with staff about the importance of ventilator care, as well as when they failed to provide ongoing teaching as new staff become involved in the process.

- **Physician & staff “partial buy-in”** (e.g., “Just another flavour of the week”). In order to enlist support and engage staff, it is important to share current baseline data on delirium rates and to share the results of improvement efforts. If the run charts suggest a large increase in rates percentage of patients screened for delirium screening or in percent compliance with delirium preventive strategies compared to baseline, issues surrounding “buy-in” tend to fade. Often a story of a recent patient, including the perspective of the patient’s perceptions of the ICU team/environment will support the need to change practice.

- **Unplanned extubation**
  Perhaps the most risky aspect of lightening the sedation that the patient is receiving daily is the chance that patients might self-extubate. This risk can be diminished by ensuring that the process is adequately supervised and that appropriate restraints are applied to the patient’s arms in a comfortable fashion.

9. Tips for Gathering Data

Use a data collection form, such as the worksheets in Appendix A, which allows you to track compliance with the bundle elements over time. Using a data collection form makes it easier to create run charts each month as well.
Safer Healthcare Now! Prevention and Management of Delirium Getting Started Kit

Case Study for Delirium Getting Started Kit
Misericordia Community Hospital

Background
The Misericordia Community Hospital is an acute care facility in Edmonton, Alberta that has 306 inpatient beds and offers 24-hour Emergency care, general medicine and surgery, orthopedics, urology, plastic surgery, intensive and coronary care, pediatrics, geriatrics, mental health, women’s health, diagnostics and ambulatory care. Covenant Health operates the Misericordia in cooperation with Alberta Health Services.

The intensive care unit has six intensive care beds and four step-down beds. At the beginning of the ICU Delirium Collaborative, the Misericordia Hospital ICU did not have the baseline data, tools to assess for the presence of delirium, nor a consistent approach to follow when caring for patients with or at risk for delirium. This was evident by the lack of a basic understanding of delirium and its long-term consequences and the absence of a common prevention and treatment plan shared and understood by all disciplines.

Setting Aims
The purpose of this initiative is to have a comprehensive approach to identify, prevent and manage delirium in the intensive care unit. Specifically:

- Develop and deliver education and support for staff regarding delirium awareness, prevention, and management within 12 months.
- Determine baseline incidence of delirium within three to four months.
- Implement processes to screen 100 per cent of all ICU patients for delirium within six months or less.
- Identify and implement standardized delirium prevention interventions in all ICU patients within 12 months or less.
- Implement standardized interventions for the management of delirium within 12 months or less.
- Implement strategies to support families of patients with delirium within 18 months or less.
- Establish ongoing education parameters.

Forming Teams
A multidisciplinary team was created to develop and implement delirium identification and reduction strategies. Membership included:

- Nurse Practitioner (Team Leader)
- Clinical Nurse Educator
- Nursing Representatives
- Respiratory Therapists
- Pharmacist
- Physiotherapists
- Intensivist / Medical Support
- Unit Manager/Supervisor (Sponsor)
A nurse practitioner led the team which met periodically to evaluate progress and plan the next phase of the strategy. Goals were established based on the needs and readiness of the unit to introduce new education and processes, outcomes of PDSA cycles and feedback from the Canadian Delirium Collaborative.

**Establishing Measures**
The team used several measures to determine if changes were leading to improvement.

**Outcome Measures:**
- Incidence of Delirium
- Average number of mobilizations per 24 hours
- Number of hours of consecutive sleep
- Utilization of narcotic, sedative infusions
- Utilization of restraints
- Number of unplanned extubations per 1000 ventilator days

**Process Measures:**
- Compliance with Delirium Screening
- Compliance with Mobilization Scoring

**Developing and Testing Changes**
The team tested, implemented and is continuing to work on the following changes:

- Physiotherapists, nurse educator and nurse practitioner provided education sessions to all nursing staff in February 2012 on delirium and delirium screening and again in September 2012 on importance of early mobilization as a delirium prevention strategy.

- ICDSC and early mobilization protocol developed and reviewed with nursing staff, laminated copies placed at each patient bedside, nurses instructed on scoring ICDSC and level of mobility, and expectations regarding delirium prevention and management, and mobilization for each patient provided.

- Level of Mobility placed on white boards in each patient room to be updated q shift and documentation in nursing notes done q shift as well. Basic transfer techniques and passive ROM techniques demonstrated and each nurse given their own copy of same.

- If nurses did not report ICDSC and level of mobility to interdisciplinary team during patient care rounds, they were asked to report. Hopefully this will help these assessments become routine practice.

- ICDSC incorporated into patient assessment q shift.

- Ongoing chart audits performed to ensure staff completion of delirium screening protocol with a goal of > 90 per cent compliance with delirium scoring achieved.

June 2013
• New ICU patient admission orders completed incorporating changes in practice with a section on delirium prevention which included:
  o Deletion of previous order for physical restraints PRN;
  o Deletion of previous order for sedation/analgesia infusions;
  o Addition of orders for nonpharmacologic strategies for delirium prevention including mobilization, minimization of noise, provision of earplugs for sleep, minimization of nighttime; and
  o nursing and medical interventions where possible, and sleep promotion.

• Senior respiratory therapist provided education to all respiratory therapists regarding importance of daily spontaneous breathing trials and new worksheet developed to ensure that patients are assessed daily for ventilatory weaning and extubation.

• Data collected on an ad-hoc basis to determine incidence of delirium.

• Initial results probably reflect lack of appropriate screening, however current trends are hopeful.

• Early mobilization audits were conducted randomly once all staff received the education. This helped to determine not only if nurses are documenting the level of mobility, but also to determine if they are mobilizing their patients according to the protocol.

• The goal is three mobility episodes per day which may include passive ROM in the sickest patients, to ventilated patients walking around the unit.

Results
Since January 2012, the Misericordia Community Hospital has incorporated ICDSC screening into patient assessment every shift and as required. Ongoing chart audits are performed to ensure staff completion of delirium screening protocol with a goal of > 90 per cent compliance with delirium scoring.
Results: Compliance to Delirium Screening

[Graph showing Compliance to Delirium Screening]

Run Chart
Since enrolling in *Safer Healthcare Now!* the team has been submitting data to the Central Measurement Team.

**Results: Incidence of Delirium**

As a result of increased screening, the identification of delirium patients increased initially. Data collected on a daily basis to determine incidence of delirium. Initial results most likely reflect lack of appropriate screening, however current trends are hopeful.
Results: Early Mobilization

Early mobilization audits were conducted randomly once all staff received education. This helped to determine not only if nurses are documenting the level of mobility, but also to determine if they are mobilizing their patients according to the protocol. The goal is three mobility episodes per day which may include passive ROM in the sickest patients, to ventilated patients walking around the unit.

![Graph showing average number of mobilizations per patient per 24 hours from August 15, 2012, to February 15, 2013. The graph shows an increase in mobilizations over time.]
Key Learnings

• The team developed and implemented a delirium screening tool in our ICU with > 90 per cent compliance. The team continues to collect statistics on delirium incidence in its patient population which has been between 15-40 per cent with a goal of < 20 per cent.

• The unit has reduced significantly utilization of narcotics and benzodiazepines and has almost completely eliminated the use of intravenous infusions of sedatives and restraints.

• The team has developed and implemented an early mobility protocol, with ongoing reinforcement of assessment and documentation of mobility scores and encouragement of staff to mobilize patients. The team has been successful at getting patients mobilizing out of bed at least once a day when physiotherapy is available, however are less successful later on in the day and in the evening. Staff members are becoming more receptive to early mobilization because they are seeing success. Nursing workload related to mobilization quickly diminishes when patients are mobilized early, as there is less time for them to develop ICU weakness/myopathy, and patients quickly adapt from a two-person assist to one-person assist or independence.

• Nurses are consistently asked during daily patient care rounds about RASS, delirium, and mobility scores and are routinely incorporating them into their daily assessments. During rounds, the physician and nurse practitioner asks about the nurse’s plan for patient mobilization for their shift and discuss reasons why patients have not been or would not be mobilized.

• Delirium information and noise reduction posters have been developed for the ICU and posted in the unit.

• Standardized pre-printed care orders have been approved by the medication management/quality committee and are currently being utilized.

• A committee including staff nurses and administration developed to update nursing documentation tools to include delirium prevention strategies. Kardex was implemented at the beginning of May 2013.

• Staff members are incorporating the ICDSC and delirium prevention strategies into daily care.

• Audit statistics have been presented at staff meetings and are posted in the unit. Staff members seem to appreciate this.

• When nurses are included in process of improvement (i.e. audits, committees) there is more buy-in for change.

• A small unit can achieve huge success in a relatively short period of time if there are champions for change!

• Data are being collected on a nightly basis by the charge nurse regarding these strategies which is being collated at an Edmonton Zone level to allow us to benchmark with other facilities in the region.
Next Steps
The team is working on a noise reduction protocol, a non-pharmacological strategy to prevent and manage delirium. A nurse educator/nurse practitioner will provide education sessions to all nursing staff on the importance of allowing patients to have uninterrupted sleep during the night.

Noise Reduction in the ICU
Why is this SO Important?

Noise levels in an ICU are extremely high. Increased noise at night may inhibit a patient’s sleep and increase the patient’s risk for delirium.

Where does the noise come from:
1. Nursing staff entering the patient’s room
2. Alarms from ventilators, monitors, IV pumps, etc.
3. TV, radio, computers, phones and other technology
4. Conversations between staff members, patients and families

What can we do to Help?
1. Offer ear plugs to the patient for sleep
2. Turn monitor alarms down in patient room when possible
3. Close doors
4. Encourage families to go home at night
5. Avoid conversations with colleagues within earshot of the patient
6. Avoid entering the patient’s room unless absolutely necessary
7. Cluster nursing care and provide care when the patient wakes up

IT IS OKAY TO LET THE PATIENT SLEEP!!!!!
The team continues to integrate these strategies into daily work. The first step is to revamp ICU flow sheet to capture current practices including delirium protocols (RASS, Delirium, and mobility). Also, the team plans to establish an accurate method to capture consecutive hours of sleep, update activity codes and incorporate the Critical Care Pain Observation Tool into routine assessment for pain.

The team will then implement family information package and continue data collection on incidents of delirium, restraint usage, sedation usage, and staff compliance for screening tool completion.
Delirium DATA Collection

- Initiate a form on EVERY patient

- Charge Nurses to collect data every night when checking charts

- Active forms are kept in the CHARGE BINDER with individual patient information

- Once a sheet is full (q4days) grab a new one and continue, all sheets stay in CHARGE Binder until patient discharged

- Once patient is discharged remove all sheets and place them into the DELIRIUM DATA BINDER at the unit clerk desk

- Unit clerks can print new sheets if you run out

- Kim will clean out Delirium DATA binder and forward DATA to the analyst
In the Intensive Care Unit

Delirium

A guide for families and patients

www.ICUdelirium.org
Appendix A: Technical Descriptions

Technical Description of the Measurement Worksheets:

<table>
<thead>
<tr>
<th>Implementation Stages</th>
<th>Definitions apply to all interventions and measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Stage (Pre-intervention)</td>
<td>Data collected for Baseline should be collected prior to implementing small tests of change and reflect the current process.</td>
</tr>
<tr>
<td>Early (Partial) Implementation Stage</td>
<td>The team has set a clear aim(s) for the intervention, identified which measures will indicate if the changes will lead to improvement, and started to implement small tests of change (PDSA) to identify and refine processes, procedures and practices which will lead to improvement and achieving the aim. When the team is close to goal they are ready to move to Full Implementation.</td>
</tr>
<tr>
<td>Full Implementation Stage (At Goal)</td>
<td>The processes, procedures and practices are finalized and have led to significant improvement. These practices on the selected unit are being consistently applied and monitored, showing a sustained performance at or close to goal. The team has achieved (and sustained) their aim(s) and is ready to spread to other areas.</td>
</tr>
</tbody>
</table>

The measurement methodology and recommendations regarding sampling size referenced in this GSK, is based on The Model for Improvement and is designed to accelerate the pace of improvement using the PDSA cycle; a “trial and learn” approach to improvement based on the scientific method.¹

It is not intended to provide the same rigor that might be applied in a research study, but rather offers an efficient way to help a team understand how a system is performing. When choosing a sample size for your intervention, it is important to consider the purposes and uses of the data and to acknowledge when reporting that the findings are based on an “x” sample as determined by the team.

The scope or scale² (amount of sampling, testing, or time required) of a test should be decided according to:

1. The team’s degree of belief that the change will result in improvement
2. The risks from a failed test
3. Readiness of those who will have to make the change

Please refer to the Improvement Frameworks GSK (2015) for additional information.

1.0 Percentage of Patients Screened for Delirium

Delirium 1 - Percentage of Patients Screened for Delirium

Year ▼ Month ▼

The percentage of patients screened for delirium for a specific patient population in order to allow for early identification, targeted prevention and the effective utilization of management strategies. Using a validated screening tool (e.g. ICDSC, Cam-ICU) all patients will be screened daily or as deemed clinically appropriate.

Denominator
1. Enter the total number of ICU patients in this sample. ▼

Numerator
2. Enter the total number of ICU patients screened for delirium, in this reporting period. ▼

Your Result
3. Numerator/Denominator x 100 = % ▼

Goal ▼

2.0 Percentage of Patients Identified with Delirium

Delirium 2 - Percentage of Patients Identified with Delirium

Year ▼ Month ▼

The incidence of delirium within the ICU. The measure will be used as a baseline assessment and as an on-going outcome measure to assess the impact of improvement efforts in reducing the rate of delirium. Using a validated screening tool (e.g. ICDSC, Cam-ICU) all patients will be screened daily or as deemed clinically appropriate.

Denominator
1. Enter the total number of ICU patients screened for delirium, in this reporting period (numerator of Delirium #1). ▼

Numerator
2. Enter the total number of patients identified with delirium upon screening, in this reporting period. ▼

Your Result
3. Numerator/Denominator x 100 = % ▼

Goal ▼
3.0 Percent Compliance with Non-Pharmalogical Strategies

Denominator
1. Enter the total number of patients who screen positive for delirium.

Numerator
2. Record which of the six Delirium bundle elements listed below have been fully implemented in your healthcare facility and would apply to this month's sample:
   1) Consider early mobility daily
   2) Optimize sleep routines
   3) Daily reassessment of sedation needs, paired with readiness to wean assessment
   4) Involve family in management of delirium
   5) Provide need for communication adjuncts
   6) Reassess restraints daily

3. Enter the total number of delirium-positive patients where all elements of the bundle have been considered.

Numerator for Compliance with individual Delirium Bundle Elements and automatic calculation
4. Enter the total number of patients in #1 that were in compliance with the Consider early mobility daily bundle element.
5. Enter the total number of patients in #1 that were in compliance with the Optimize sleep routines bundle element.
6. Enter the total number of patients in #1 that were in compliance with the Daily reassessment of sedation needs, paired with readiness to wean assessment bundle element.
7. Enter the total number of patients in #1 that were in compliance with the Involve family in management of delirium bundle element.
8. Enter the total number of patients in #1 that were in compliance with the Provide need for communication adjuncts bundle element.
9. Enter the total number of patients in #1 that were in compliance with the Reassess restraints daily bundle element.

Your Result
10. Numerator/Denominator x 100 = %

Goal 100%

4.0 Number of Unplanned Extubations per 1000 Mechanical Ventilation Days

An unplanned extubation is the unscheduled removal of an artificial airway (endotracheal or tracheostomy tube) due to accidental dislodgement or patient self extubation. The patient need not be ventilated at the time of the event (e.g. tracheal collar). The occurrence of unplanned extubations may be associated with patient harm, poorer outcomes and prolonged length of stay, due to loss of the airway and the risks associated with re-intubation. Predisposing factors may include inadequate/inappropriate: (1) patient vigilance, nurse, patient ratios, and use of physical restraints; (2) practices for: analgesia, sedation/comfort, delirium assessment/management, patient mobilization and transport; (3) ETT position, length and fastening.

Denominator
1. Enter the total number of invasive mechanical ventilation days, in this reporting period.

Numerator
2. Enter the total number of unplanned extubations, in the reporting period.

Your Result
3. Numerator/Denominator x 1000

Goal Less than 5 per 1,000 invasive mechanical ventilation days
Appendix B: Sample Checklists

Covenant Health ICU Delirium Screening Checklist
[Misericordia Hospital Revised from Skrobik & Bergeron (2001) ICM]

Scoring System
The scale is completed based on information collected from each shift.
- Obvious manifestations of an item score 1 point
- No manifestation or no assessment possible scores 0 points
Delirium is present if the total score is 4 or more points.

<table>
<thead>
<tr>
<th>Date and Time</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altered Level of Consciousness (Do not score if RASS is “minus 5”)</td>
<td></td>
</tr>
<tr>
<td>Inattention</td>
<td></td>
</tr>
<tr>
<td>Disorientation</td>
<td></td>
</tr>
<tr>
<td>Hallucination - delusion, psychosis</td>
<td></td>
</tr>
<tr>
<td>Inappropriate speech or mood</td>
<td></td>
</tr>
<tr>
<td>Sleep/Wake cycle disturbance</td>
<td></td>
</tr>
<tr>
<td>Psychomotor agitation or retardation</td>
<td></td>
</tr>
<tr>
<td>Symptom fluctuation</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL SCORE**

**DEFINITIONS**

**Altered LOC**
- If RASS “minus 5” or LOC cannot otherwise be assessed, score with a ø symbol
- If RASS “zero” or “minus 1” score 0
- If RASS “minus 2” or “minus 3” or “minus 4” score 1 point
- If RASS “plus 1” or “plus 2” or “plus 3” or “plus 4” score 1 point

**Maximum 1 pt**

**Inattention**
- Difficulty in following a conversation or instructions
- Easily distracted by external stimuli
- Difficulty in shifting focus

**Maximum 1 pt**

**Disorientation**
- Any obvious mistake in person, place or time

**Maximum 1 pt**

**Hallucination, Delusion or Psychosis**
- Unequivocal clinical manifestation of hallucination
- Gross impairment of reality

**Maximum 1 pt**

**Psychomotor Agitation or Retardation**
- Hyperactivity requiring the use of additional sedative drugs or restraints
- Hypoactivity or clinically noticeable psychomotor slowing

**Maximum 1 pt**

**Inappropriate speech or mood**
- Inappropriate, disorganized or incoherent speech
- Inappropriate display of emotion related to events or situation

**Maximum 1 pt**
<table>
<thead>
<tr>
<th>Sleep/Wake cycle disturbance</th>
<th>Maximum 1 pt</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sleeping &lt; 4 hours or frequent spontaneous waking at night</td>
<td></td>
</tr>
<tr>
<td>• Sleeping most of the day</td>
<td></td>
</tr>
<tr>
<td>Symptom Fluctuation</td>
<td>Maximum 1 pt</td>
</tr>
<tr>
<td>• Significant change in any of the above symptoms since last assessment</td>
<td></td>
</tr>
</tbody>
</table>
### Mental Status

<table>
<thead>
<tr>
<th>Level of Consciousness</th>
<th>Other restless, not asleep</th>
<th>Other restless, not asleep</th>
<th>Other restless, not asleep</th>
<th>Other restless, not asleep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of Consciousness</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Orientation</td>
<td>Other difficult</td>
<td>Other difficult</td>
<td>Other difficult</td>
<td>Other difficult</td>
</tr>
<tr>
<td>Induced Decreased LOC</td>
<td>Sedation</td>
<td>Sedation</td>
<td>Sedation</td>
<td>Sedation</td>
</tr>
<tr>
<td>Affect/Behaviour</td>
<td>Agitated, Restless, Uncooperative</td>
<td>Restless</td>
<td>Restless</td>
<td>Restless</td>
</tr>
</tbody>
</table>

**DCMU Delirium Screening (ICDSC Score)**

<table>
<thead>
<tr>
<th>Alteration Level of Consciousness Score</th>
<th>WMMAAS = 4, 5, 6</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distraction Score</td>
<td>Difficulty in following commands</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Disorientation Score</td>
<td>Unable to assess</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Hallucinations/Delusions Score</td>
<td>Unable to assess</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Psychomotor Agitation/Retardation Score</td>
<td>Hyperactivity</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Inappropriate Speech/Mode Score</td>
<td>Unable to assess</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Sleep/Wake Cycle Score</td>
<td>Seeping &lt;4 hrs at night</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Symptom Fluctuation</td>
<td>Fluctuations in any of the above over 24hr period</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**Total ICDSC Score**

| 5 | 0 |
Appendix C: Other Tools

London Health Sciences Centre

**STEP 1:** Assess Pain (NSR or CPOT)
- Treat pain/decrease analgesics as indicated

**STEP 2:** Determine VAMASS
- For dangerous agitation (VAMASS 5-6) consider propofol by infusion
- VAMASS <3
- VAMASS >3
  - Assess sedation and attempt reduction if appropriate
  - If no sedation, assess neurological status and consider sub-harline EEG

**STEP 3:** ICDSC Screen
- ICDSC < 4
- Enact non-pharmacological measures (Appendix C)
- and rescreen Q4H
- ICDSC ≥ 4 “Screen is positive”
  - Notify physician and treat possible causes (Appendix A)
  - Remove or substitute deliriogenic drugs if possible (Appendix B)
  - AND
  - Enact non-pharmacological measures (Appendix C)

**Consider Antipsychotics (ordering recommendations):**
1. Regular dose haloperidol 0.5-2 mg\(^1\) IV Q6H and
2. PRN Haldol 0.5-2 mg\(^1\) IV Q2H PRN for mild agitation and
3. Haloperidol 2.4 mg\(^1\) IV Q2H PRN for dangerous agitation

Titrination Guideline: If ICDSC > 0-1, increase regular dose of haloperidol to equal the total daily dose during the preceding 24 hour period (PRN plus regular dose). Divide this total dose into 6 regular doses (consider a higher dose at bedtime).

\(^1\) If age > 65: Initiate low end of dosing range.
- Maximum Daily Dose: 20 mg/d (15 mg/day if > 65 years old)
- Consult Adult Psychiatry: Consult if no improvement in ICDSC in 48 hours, on more than 2 antipsychotics or history of dementia, or patient with Parkinson’s disease\(^2\) or long QT\(^3\).  
- Weaning: Initiate when ICDSC = 0 X 24 hours. See Appendix E for weaning guidelines.

Contraindication: Parkinson’s disease\(^2\)
- Precautions:
- Prolonged QT\(^3\), heart block, hypotension, reduced respiratory drive, hepatic dysfunction
- Monitoring:
- QT (Appendix D), extrapyramidal side effects, ICDSC
Bluewater Health

Confusion Assessment Method for the ICU (CAM-ICU) Flowsheet

1. Acute Change or Fluctuating Course of Mental Status:
   Is there an acute change from mental status baseline?
   OR
   Has the patient’s mental status fluctuated during the past 24 hours?

   YES

2. Inattention:
   • "Squeeze my hand when I say the letter ‘A’.”
     Read the following sequence of letters: ABRACADABRA
     ERRORS: No squeeze with ‘A’ & Squeeze on
     letter other than “A”
   • If unable to complete Letters Numbers

   >2 Errors

3. Altered Level of Consciousness
   Current RASS level

   RASS = zero

4. Disorganized Thinking:
   1. Will a stone float on water?
   2. Are there fish in the sea?
   3. Does one pound weigh more than two?
   4. Can you use a hammer to pound a nail?

   Command: “Hold up this many fingers” (Hold up 2 fingers)
   “Now do the same thing with the other hand” (Do not demonstrate)
   OR “Add one more finger” (If patient unable to move both arms)

   >1 Error

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http://www.icudelirium.org/docs/CAM_ICU_flowsheet.pdf
## CAM-ICU WORKSHEET

<table>
<thead>
<tr>
<th>Feature 1: Acute Onset or Fluctuating Course</th>
<th>Score</th>
<th>Present</th>
<th>Present</th>
<th>Present</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Is the patient different than his/her baseline mental status?</td>
<td>Either question YES</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>B. Has the pt had any fluctuation in mental status in the past 24 hours as evidenced by fluctuation on a sedation scale (i.e. RASS), GCS or previous delirium assessment?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
</tbody>
</table>

### Feature 2: Inattention

**Letters Attention Test**

**Directions:** Say to the patient, “I am going to read you a series of 11 letters. Whenever you hear the letter “A”, indicate by squeezing my hand.” Read letters from the following list in a normal tone, 3 seconds apart:

A B R A C A D A B R A

Errors are counted when patient fails to squeeze on the letter “A” and when the patient squeezes on any letter other than “A”. OR Picture recognition (see picture ring)

| Number of Errors >2 | □ | □ | □ | □ |

### Feature 3: Altered Level of Consciousness

Present if the actual RASS score is anything other than alert and calm (zero)

| RASS anything other than zero | □ | □ | □ | □ |

### Feature 4: Disorganized Thinking

**Yes/No Questions:**

1. Will a stone float on water?
2. Are there fish in the sea?
3. Does one pound weigh more than two pounds?
4. Can you use a hammer to pound a nail?

Errors are counted with the patient incorrectly answers a question.

**Command**

Say to patient: “Hold up this many fingers” (Hold 2 fingers in front of patient). “Now do the same thing with the other hand.” (Do not repeat number of fingers). If patient is unable to move both arms for 2nd part of command, ask patient to “Add one more finger.”

| Combined number of errors >1 | □ | □ | □ | □ |

Overall CAM-ICU Feature 1 plus 2 and either 3 or 4 present = CAM-ICU positive

<table>
<thead>
<tr>
<th>Criteria Met</th>
<th>CAM-ICU Positive (Delirium Present)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Criteria Not Met</th>
<th>CAM-ICU Negative (No Delirium)</th>
</tr>
</thead>
</table>

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http://www.icudelirium.org/docs/CAM_ICU_worksheet.pdf
University of Alberta Hospital

GSICU / Firefighters' Burn Unit
Delirium Protocol

Weight _______ kg    Height _______ cm

1. Medication orders must include drug, dose, route, frequency, and if applicable, duration.
2. If medication order is STAT or URGENT, notify RN and place a note in the STAT/URGENT box at right.
3. Implement optional orders by marking the prompt box or delete them by striking the order out.
4. Orders marked with ** MUST be performed unless struck out.

Exclusion criteria:
- History of neuroleptic malignant syndrome (NMS)
- Allergy to quetiapine or olanzapine
- Known psychiatric history and already on antipsychotic medications
- Known seizure disorder
- Do not administer delirium protocol medications if QTc ≥ 0.5 sec without notifying physician

If ICDSC < 4, use PRN therapy for agitation:
- HALoperidol
  - Haloperidol 5 mg po q 1 h PRN (maximum 30 mg in 12 hours) OR
  - Haloperidol 5 mg IV q 15 min PRN (maximum 30 mg in 12 hours)
  - Use oral route preferentially, if possible

If ICDSC ≥ 4:
- Initiate METABOLIC EVALUATION for delirium:
  - Notify MD of CURRENT vital signs (BP, HR, temperature, RR and oxygen saturation)
  - Notify of intention to initiate TITRATED therapy
  - Perform STAT glucose, arterial blood gas, and lactate
  - Draw CBC, electrolytes, urea, creat, AST, ALT, Alk Phos, Total Bilirubin, ionized Ca, Mg, PO4
  - Notify if not performed in previous 24 hours
  - Other acute investigations (consider evaluation for sepsis):
    - Initiate TITRATED therapy for delirium:
      - QUetiapine
        - Quetiapine 25 mg NG/ po q 12 h (08:00 and 20:00)
        - At the beginning of each shift, increase dose of Quetiapine by 12.5 mg q 12 h
          (to a maximum dose of 200 mg in 12 hours) IF ICDSC ≥ 4 OR two or more doses
          of PRN haloperidol are given on the previous shift

**Call MD to advise regarding evaluation and dose reduction if patient appears excessively sedated (SAS/ Riker < 3 or RASS between -3 to -5)**

Physician Signature: ___________________________  Date / Time: ___________________________

GSICU / Firefighters' Burn Treatment Unit Delirium Orders  Draft June 2012 (version 2012.5)  Page 1 of 1
References


9. Safer Healthcare Now! ICU Collaborative Community of Practice-Community Documents- Collaborative Team Tools for Sharing


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- www.icudelirium.org - Confusion Assessment Method flow and work sheet -
  http://www.icudelirium.org/docs/CAM_ICU_flowsheet.pdf
  http://www.icudelirium.org/docs/CAM_ICU_worksheet.pdf


