CCBC ICU Liberation Bundle Elements

Critical Care BC partnered with interdisciplinary Critical Care (CC) leaders from across BC to compile evidence-informed, best practice recommendations reflecting provincial consensus on clinical elements shown to improve patient and family outcomes. Each Element of the ICU Liberation Bundle is addressed in this document.

Why ICU Liberation?

Improving provincial practice through use of the ICU Liberation bundle offers significant benefits by reducing preventable harms—such as undertreated pain, oversedation, delirium, immobility, and ICU-acquired weakness—as well as modifiable risks associated with inadequate family engagement. Strengthening these practices helps decrease the incidence of Post-Intensive Care Syndrome (PICS) and contributes to fewer days on mechanical ventilation and shorter ICU stays, benefiting patients and the health system. By standardizing these evidence-informed practices across health authorities, patients and families experience more consistent, human-centered care that prioritizes engagement, recovery, and dignity. A coordinated, interdisciplinary approach not only strengthens communication and the culture of care but also reduces variation, improves outcomes, and lessens long-term PICS-related impacts, ultimately creating a more sustainable and equitable critical care system across the province.

Eradicating Indigenous Specific Racism

CCBC denounces all forms of racism and discrimination and understands that meaningful change requires everyday commitment. Critical care staff and providers should consider how Indigenous Peoples' experiences in the health system have differed due to systemic inequities and unsafe care. Guided by the principles of British Columbia's Declaration on the Rights of Indigenous Peoples Act (DRIPA), all CC staff should acknowledge personal biases, engage in continuous learning, and adjust practice to foster culturally safe, high-quality care for Indigenous individuals and families.

Implementation Considerations

Patients, caregivers and families represent many groups and races within BC, each with their own uniqueness and experiences with racism and discrimination in the health system. At all times, communication and care planning should be clear and uphold patient autonomy, including family and/or community member involvement whenever possible. We strongly recommend a curiosity approach when applying the Elements of the ICU Liberation Bundle, giving priority to What Matters to patients and their families.

For example, delirium assessment and management should incorporate meaningful cultural elements, such as language and identity, while avoiding misinterpretation of traditional practices as symptoms. Mobility and rehabilitation can be strengthened by honoring familial and cultural practices and involving patients, families and caregivers. Family engagement should extend to anyone the patient feels is important, with flexibility for cultural rituals and visiting needs. Honoring their unique context and *What Matters to Them* helps build trust and improve outcomes for all requiring CC Services in BC.

ICU Liberation Bundle – Element A

Assess, prevent, and manage pain.

Why assessment, prevention, and management of pain matters

Pain is an unpleasant sensory and emotional experience that is best reported by the person who is experiencing it, although self-reporting can be a challenge in the ICU. The inability to communicate verbally does not negate the possibility that a patient is experiencing pain. Studies show that 50-80% of ICU patients experience pain, especially procedural pain (Stites, 2013). Pain is also a significant modifiable risk factor for delirium (Brummel & Girard, 2018).

Assessment

Patients with diminished communication or cognitive capabilities are at risk of experiencing higher levels of pain. A reliable and valid pain assessment is the foundation for effective pain treatment. Choosing the best intervention to treat pain is challenging.

A stepwise approach to pain assessment is encouraged:

- Attempt to obtain a patient's self-report of pain, including intensity.
- Look for behavioral changes.
- Ask the family to help identify pain behaviors.
- Assume that pain is present.

Pain should be assessed and documented frequently in the ICU, at least every four hours, and reassessment should be performed within one hour after an intervention is made to see if the treatment was effective.

The following tools are available to guide pain assessments:

Behavioral Pain Scale (BPS)

- Behavioral Pain Scale (BPS)
- Behavioral Pain Scale Training Poster
- Behavioral Pain Scale (BPS) for Pain Assessment in Intubated Patients

Critical Care Pain Observation Tool (CPOT)

- Critical-Care Pain Observation Tool (CPOT)
- Critical-Care Pain Observation Tool: How to Use It in Your ICU
- Critical-Care Pain Observation Tool (CPOT)

CPOT and BPS are both validated for use in CC (Devlin 2018).

Intervention and Prevention

The most important step to prevent pain is to recognize how painful ICU procedures can be for patients. Turning, wound drain removal, wound care, chest tube removal, and arterial line insertion are among the most painful procedures. Administering analgesia pre-procedure and/or providing nonpharmacologic interventions should be considered for other procedures as well. **Treat pain first, especially with any new or escalating agitation.**

It is recommended to consult with the patient's caregiver and/or family, if possible, about the patient's pain history and effective or preferred coping strategies the patient engaged in prior to admission.

Nonpharmacologic Interventions:

- Relaxation and/or distraction techniques
- Family presence for support and distraction
- Information/education
- Massage/touch
- Music therapy (patient preference)
- Pet therapy

For pharmacologic treatment of pain:

- IV opioids should be considered as the first-line drug class for non-neuropathic pain.
- IV opioids are especially effective when titrated to a goal.

Additional tools

- ICU Liberation A-F Bundle Overview Videos – Click on Element A on the left-hand side
    - ICU Liberation A-F Bundle Overview (sccm.org)

Recommendations

- Review unit data for documented assessments, analgesic administration and the promotion and use of non-pharmacological interventions.
- Tailor pain prevention, frequent assessment and prompt treatment to the patient's individual needs, in partnership with caregivers and families when appropriate.
- Assess and document pain scores and responses to treatment every four hours or more frequently.

ICU Liberation Bundle – Element B

Both Spontaneous Awakening Trials and Spontaneous Breathing Trials.

Critical care practice has been trending toward administering the lightest sedation safely possible to support early mobilization and readiness for spontaneous breathing trials, reducing ventilator days and improving outcomes. To achieve this, teams must commit to consistent interdisciplinary communication and coordination, ensuring every patient is assessed daily for sedation and breathing readiness. Continuous evaluation of local practices using standardized, reliable data is essential as we build systems to track progress and close gaps, driving sustained improvement across all units.

Do SATs and SBTs make a difference in patient outcomes?

Yes, researchers report that pairing SATs and SBTs together can reduce:

- mortality (28-day - 7%; 1 yr. - 11% [SAT/SBT vs SBT + usual care] [2])
- mechanical ventilation days (3.1 days [1])
- necessity for tracheostomy (21% [2])
- ICU length of stay (~ 4 days [2])

Recommendations

- Set a unit goal to target light/no sedation (RASS 0) as per the PADIS Guidelines[3].
- Discuss sedation target and score, and results of SBT during daily interdisciplinary rounds.
- Identify a unit standard for SBT assessment time and mode and broadly communicate amongst interdisciplinary teams to support consistency and workflow.
- Screen daily and complete SBT when criteria are met, in alignment with organizational guidance.
- Document sedation targets, RASS scores and results of SBTs to support safe handover, continuity of care, quality improvement evaluation, research to improve patient outcomes, and growth of a learning health system.

ICU Liberation Bundle – Element C

Choice of Analgesic and Sedation

Introduction

The "C" element of the ICU Liberation Bundle consists of choice of analgesia and sedation. This element focuses attention on constructing safe and effective non-pharmacological and medication regimens for the management of pain and agitation in critically ill adults, consistent with the pain, agitation/sedation, delirium, immobility, and sleep disruption PADIS guidelines (Devlin, 2018).

Assessment

Pain should be assessed every four hours or more, especially with agitation or procedures, using a validated tool, such as the Behavioral Pain Scale (BPS) or Critical Care Pain Observation Tool (CPOT). Depth of sedation should be assessed every four hours or more, using a validated tool (Richmond Agitation Sedation Scale (RASS)) to prevent over or undersedation. Document a daily RASS goal and titrate sedatives to meet that goal.

Recommendations

- Consider Dexmedetomidine and Propofol as preferred sedatives as they are rapidly titratable.
- Avoid benzodiazepine infusions whenever safely possible, due to delayed titration and association with delirium and prolonged mechanical ventilation.
    - Consider benzodiazepine infusions when patients require deep sedation and propofol and opioids are insufficient, when patients have severe hemodynamic instability due to illness or propofol intolerance, and when patients have Propofol-related Infusion Syndrome (PRIS).
- Target light sedation, considering unit safety, unit experience and patient specific requirements.
- Discuss RASS goal, analgesic and sedative choices, and effectiveness during daily interdisciplinary rounds, report pain, sedation and delirium scores and response to treatment and trends.
- Encourage non-pharmacologic therapies as adjuncts to sedation.
- Document RASS and pain score every four hours or more to support safe handover, continuity of care, QI evaluation, research to improve patient outcomes, and growth of a learning health system.

Additional tools

- ICU Liberation A-F Bundle Overview Videos – Click on Element C on the left-hand side
    - ICU Liberation A-F Bundle Overview (sccm.org)
- Appendix A – Pharmacologic and non-pharmacologic treatment recommendations
- CCBC Podcast – Sedation: The Art, The Science, the Shenanigans. Critical Care Conversations

Appendix A - Intervention

Agitation: PADIS guideline recommendations for the treatment of agitation:

- Recommend light sedation (vs. deep sedation) in critically ill, mechanically ventilated patients
- Suggest using propofol or dexmedetomidine over benzodiazepines (midazolam or lorazepam) for sedation in critically ill mechanically ventilated patients

Sedatives for Adult Patients on Mechanical Ventilation in CC:

Drug		Onset and duration	Precautions for use	Usual dose	Significant adverse effects
Propofol		Onset: 1 min Duration: Short term: - 0.5 - 1 hr Long term (more than 7 days): - variable, 25-50 hr has been observed (depends on depth and time on sedation	Hypotension, bradycardia, hepatic/renal failure, pancreatitis	5-50 µg/kg/min, 0.3-3 mg/kg/hr	Hypotension, respiratory depression, bradycardia, propofol infusion syndrome – monitor lipids throughout therapy
Dexmedetomidine		Onset: 5-10 min with LD, 1-2 hr without LD Duration: 1-2 hr	Hepatic failure, symptomatic bradycardia	LD: 0.5-1 µg/kg (optional) MD: 0.2-0.7 µg/kg/hr	Hypo- or hypertension, bradycardia
Lorazepam	Caution	Onset: 5-20 min Duration: 4-8 hr, prolonged with CI	Delirium, renal failure	Intermittent: 1-4 mg IV every 4-6 hr	Oversedation, propylene glycol toxicity
Midazolam		Onset: 3-5 min Duration: 2-6 hr, prolonged with CI	Hepatic failure, end-stage renal failure, dialysis, delirium	0.02-0.1 mg/kg/hr	Oversedation

Abbreviations: CI = continuous infusion, LD = loading dose, MD = maintenance dose.

General Approach to Pharmacologic Management of Acute Agitation:

Situation	Preferred intervention
Agitation and pain	Fentanyl until pain resolves
Acute agitation in a patient who requires deep sedation	Propofol and an additional opioid infusion as needed
Acute agitation in a non-intubated patient	Anti-psychotic or dexmedetomidine infusion

Pain: PADIS guideline recommendations and suggestions for the treatment of pain.

General Approach to Treating Acute Pain in Adult CC:

Situation	Preferred intervention
Acute pain	Fentanyl IV push until pain resolves
Acute pain that persists or recurs	Fentanyl infusion plus fentanyl IV push for breakthrough pain
Acute pain in chronic opioid use	Account for prior opioid use when dosing IV opioid (consider ketamine)
Planned transition out of CC and patient on IV opioid infusion	Start scheduled oral or enteral opioid (e.g., oxycodone) therapy plus intermittent IV opioid (e.g., IV push or patient-controlled analgesia)

Opioids Commonly Used in the Adult CC:

Drug	Usual starting dose	Drug-specific adverse effects	Drug accumulation factors
Fentanyl	CI: 12.5-25 µg/hr OR CI: 0.35-0.5 µg/kg	Muscle rigidity	Hepatic failure, high volume of distribution, high lipophilicity, unpredictable clearance (long context-sensitive half-time) with prolonged infusion
Morphine	CI: 1-2 mg/hr	Hypotension, bradycardia from histamine release	Hepatic failure, active metabolite (3-morphine glucuronide) accumulation in renal failure
HYDROmorphone	CI: 0.25-0.5 mg/hr	Overdose effects from dosing errors of high-potency opioids	Hepatic failure

Drug	Usual starting dose	Drug-specific adverse effects	Drug accumulation factors
Methadone	N/A	QTc prolongation, serotonin syndrome	Long half-life, delayed clearance with hepatic and renal failure

Abbreviations: CI = continuous infusion, LD = loading dose.

Nonopioid Analgesia Commonly used in Adult CC:

Non- opioid analgesic	Recommendation
Acetaminophen	Use as an adjunct to opioid therapy to decrease pain intensity and opioid consumption.
Ketamine	Use low-dose ketamine (1-2 µg/kg/hr) as an adjunct to opioid therapy to reduce opioid use in post-surgical adults.
Gabapentin and pregabalin	Use neuropathic pain medications with opioids for neuropathic pain management. Use with opioids after cardiovascular surgery.
Lidocaine	Do NOT routinely use IV lidocaine as an adjunct to opioid therapy.
COX-1 selective NSAIDs	Do NOT routinely use a COX-1 selective NSAID as an adjunct to opioid therapy.

Abbreviations: NSAID = nonsteroidal anti-inflammatory drug.

Non-pharmacological treatment/prevention	Recommendation
Massage therapy	Offer 10- to 30-minute massages once or twice daily for 1 to 7 days. Encourage family participation whenever possible.
Music therapy	Use patient preferred choice of music therapy for procedural and nonprocedural pain.
Cold therapy	Offer cold therapy for procedural pain.
Breathe therapy	Guide the patient through slow, deep breathing during procedural or nonprocedural pain/anxiety
Reposition	Reposition the patient every 2 hours, or more frequently, ensuring lumbar support when sitting and/or support between the legs while on their side to prevent/relieve pain.

ICU Liberation Bundle – Element D

Assessing, Preventing, and Managing Delirium.

Introduction

The "D" element of the ICU Liberation Bundle consists of assessing, preventing, and managing delirium.

Delirium is experienced by 50% to 80% of mechanically ventilated patients and 20% to 50% of patients with lower-severity illness, resulting in prolonged hospitalization and duration of mechanical ventilation and increased costs. Long-term effects include increased risk of mortality and long-term cognitive impairment. The etiology of delirium is often multifactorial. There is limited evidence to support pharmacologic interventions. Thus, our most powerful interprofessional tools are daily prevention using nonpharmacologic interventions and early recognition.

Assessment

Delirium should be routinely monitored in all ICU patients using validated and reliable delirium screening tools. It is recommended that screening be performed at least once a shift and more frequently for any changes in mental status.

- Confusion Assessment Method for the ICU (CAM-ICU)
- Intensive Care Delirium Screening Checklist (ICDSC)

Intervention

Strategies for delirium treatment include all the nonpharmacologic interventions outlined for prevention (below). When a patient has delirium, the first step is to identify the potential etiology. A useful mnemonic to evaluate of the cause of delirium is THINK: Stop, THINK, and lastly medicate.

T	Toxic situations
H	Hypoxemia
I	Infection/sepsis
N	Non-pharmacologic Interventions
K	Electrolyte Problems

This framework directs our attention to identifying etiology first, before moving toward pharmacologic strategies. If all potential risk factors have been addressed and/or removed and all aetiologies have been considered and treated, consider initiation of pharmacologic therapies.

Consider using dexmedetomidine for delirium in mechanically ventilated adults when agitation precludes weaning ventilatory support.

- Reduce/avoid deliriogenic drugs and provide daily sedation breaks when safe
- Improve wakefulness (reduce sedation)

Prevention

Prevention of delirium focuses on implementation of nonpharmacologic strategies to minimize delirium risk factors with integration of all elements of the ICU Liberation Bundle. Additionally, daily ICU care should focus on optimizing comfort and mobility, promoting sleep, and maintaining day-night cycles and patients' normal routines as much as possible. There are no data to support the routine use of antipsychotics for the prevention of ICU delirium in adults.

Key strategies for delirium prevention include:

Nonpharmacologic: Employ a multicomponent strategy, including:

- Daily and regular orientation to the environment
- Engaging patients with familiar items from home and family interaction
- Removing urinary catheters and invasive devices as early as possible
- Reducing visual or hearing impairment by providing hearing aids and glasses as needed
- Early rehabilitation with daily mobility goals
- Optimizing nutrition and hydration
- Promoting sleep at night and clustering patient care activities during the daytime
- Exposure to sunlight during the daytime and dimming lights and minimizing noise at night
- ICU diaries

Additional tools

- ICU Liberation A-F Bundle Overview Videos – Click on Element D on the left-hand side
  - ICU Liberation A-F Bundle Overview (sccm.org)

Recommendations

- Ensure pain is assessed often and treated adequately to prevent or minimize delirium.
- As part of unit culture, prevent delirium for all patients, starting at admission.
- Assess for delirium throughout the shift, using a unit standard validated tool and unit standard documentation process.
- Report delirium during daily interdisciplinary rounds, considering any medications or environmental factors that may be contributing to delirium.

ICU Liberation Bundle – Element E

Early Mobility and Exercise.

Introduction

The "E" element of the ICU Liberation Bundle consists of early mobility and exercise. Early mobilization of critically ill patients has been shown to be safe and feasible in both adult and pediatric populations. In adults, studies have shown that early mobilization decreases delirium, improves functional outcomes, and is cost effective.

Mobilization of critically ill patients is a shared responsibility between allied health, nursing and support staff. Physicians can help by asking about mobility progress and pain during daily interdisciplinary rounds. The ICU Liberation Bundle is about unit culture, and we all contribute.

Assessment

Early mobility in critical care means as soon as safely possible after admission. Hodgson et al. (2014) provide consensus recommendations on safety parameters for mobilizing adult, mechanically ventilated patients, including termination parameters. Mobilizing critically ill patients can vary based on the strength of activity, from passive stretching to active walking. Consider the following safety aspects before declaring a critically ill patient's activity goal:

- Neurologic — level of alertness, weakness of an extremity, deconditioning
- Cardiac — hemodynamic stability and vasoactive medication dose
- Pulmonary — ventilation and oxygenation requirements
- Lines and drains — stability of lines, location, comfort if mobilized
- Available people — i.e. nursing, respiratory therapy, occupational and/or physiotherapy and family/essential care providers

If activity goals are not being met, consider these questions:

- Is pain adequately controlled to allow for comfortable activity?
- Is the patient alert enough to participate?
- Does sedation need to be optimized?
- What was the patient's activity level prior to admission?
- Is there enough support staff available to assist with mobilization?
- What other barriers exist?
- What can be modified to reduce barriers to early mobilization?

Intervention

While encouraging and physically supporting patients' efforts to achieve their individual goals, staff must watch the patient, watch the monitors, and watch the lines while gradually increasing the activity level.

Early mobility is a team intervention requiring coordination across nursing and allied health disciplines to reach goals. It is important to set a daily activity goal with each patient based on their clinical status and resources available for support.

Recommendations

- Encourage use of a standardized early mobility protocol, such as described in Berry et al. (2017) and Critical Care Services Ontario (2022) - see references for links.
- Conduct daily mobility assessments using protocolized tools, and document in the patient's record.
- Determine whether sedation should be suspended or reduced. Do not delay or defer physical activity because of agitation if it can be safely managed by the mobilizing team.
- Schedule time to work on physical activity with the patient, family, nurse, respiratory therapist, physiotherapist and/or occupational therapist.
- Engage patients, caregivers and family as partners in identifying individualized daily mobility goals and actions to support recovery.
- Assess, manage and document the patient's pain before, during, and after mobility activities.
- Monitor and document the patient's work of breathing, level of alertness and vital signs.

Additional tools

- ICU Liberation A-F Bundle Overview Videos – Click on Element E on the left-hand side
    - ICU Liberation A-F Bundle Overview (sccm.org)
- Early Mobility Resources – Johns Hopkins
    - Websites for Early Mobility - Early Mobility - Welch Medical Library Guides at Johns Hopkins University-Welch Medical Library

ICU Liberation Bundle – Element F

Family Engagement and Empowerment.

Introduction

The "F" in the ICU Liberation Bundle stands for Family Engagement and Empowerment. It encourages family presence in Critical Care (CC) and supports strategies to involve and empower them to become active contributors in individualized patient care. Including families in care can improve safety and quality, while helping reduce patient anxiety, confusion, and agitation. Whenever possible, prioritize engaging both patients and their families.

Family means anyone the patient considers important in their life.

Exemplary patient and family centered care is demonstrated when we:

- Ensure patients and families feel informed and supported across their trajectory.
- Build a shared understanding of each patient's experience of illness, their cultural values, and personal goals and preferences – this should be two-way information sharing.
- Encourage active participation in care decisions and self-management.
- Encourage a therapeutic environment prioritizing both physical comfort and emotional well-being for patients and their loved ones.
- Tailor care to 'What Matters to You' – the patients, caregivers and families, calling staff and providers to ask, listen, and modify care plans to accommodate their priorities as much as safely possible.

Assessment

Assessment consists of inviting the family into the unit and engaging them to provide a holistic assessment of the patient. Include the patient whenever possible.

- Identify key family members, which may include individuals who are not formally related.
- Identify key decision-makers and substitute decision makers, if appropriate.
- Assess family resources and identify potential support needs with them.
- Identify the patient's personal and cultural beliefs and other key information to support the CC team in best understanding the patient.
- If the patient is unable to speak for themself, engage the family in identifying patient preferences and routines such as favorite physical activities, music, digital entertainment, favorite physical activities, typical sleep/wake cycles, etc.

Interventions

Interventions should be individualized to patient/family preferences, whenever possible. Family engagement can be promoted through:

- Patient communication support tools – whiteboards, letterboards, tablets, ICU diaries, Speech Language Pathologist consultation.
- Flexible visitation and virtual access when in-person visitation is not possible.
- Referral to Family Caregivers of BC, for free, virtual and/or in-person support across BC.

- Resources to help families navigate ICU terminology, common interventions, and the recovery process.
- Involvement of patients and family in interdisciplinary rounds – include preparation support for them and staff/providers involved.
- Proactive and responsive meetings with family guided by a structured communication tool
- Review the Recovery after Critical Care Guide for patients and families (poster).

Additional tools

ICU Liberation A-F Bundle Overview Videos – Click on Element F on the left-hand side	ICU Liberation A-F Bundle Overview (sccm.org)
Get To Know Me page – as an example from University of Washington	Copy of Get to Know Me form
Appendix A – Structured Communication tool - VALUE mnemonic from University of Washington	Summary of V.A.L.U.E. mnemonic
Communication Assistance for Youth and Adults BC (CAYABC). This Canadian organization offers augmentative/alternative communication tools and e-modules	https://cayabc.net/

Recommendations

- Ensure a means to communicate patient preferences and goals to the care team.
- Ensure interdisciplinary involvement in all stages of an intervention and include patient and family partners whenever possible.
- Discuss patient and family suggestions and concerns during daily interdisciplinary rounds; include them in discussion, whenever possible.
- Support cultural safety and humility by identifying and integrating patients' and families' cultural or spiritual practices into care.
- Advocate for Patient and/or Family Partner involvement on Quality Committees.
- Review patient survey feedback to help choose appropriate interventions the unit can realistically support with resources.

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