

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

# Physical Restraints for the Prevention of Self-Extubation or Line or Tube Removal in Critically Ill Patients: Clinical Effectiveness and Guidelines

Service Line: Rapid Response Service  
Version: 1.0  
Publication Date: May 01, 2019  
Report Length: 7 Pages

**Authors:** Deba Hafizi, Suzanne McCormack

**Cite As:** *Physical Restraints for the Prevention of Self-Extubation or Line or Tube Removal in Critically Ill Patients: Clinical Effectiveness and Guidelines*. Ottawa: CADTH; 2019 May. (CADTH rapid response report: summary of abstracts).

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**Funding:** CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

## Research Questions

1. What is the clinical effectiveness and safety of using physical restraints for critically ill patients to prevent self-extubation, line, or tube removal?
2. What are the evidence-based guidelines regarding the use of physical restraints for critically ill patients to prevent self-extubation, line, or tube removal?

## Key Findings

Two systematic reviews and one non-randomized study were identified regarding physical restraints for the prevention of self-extubation, line, or tube removal in critically ill patients.

## Methods

A limited literature search was conducted on key resources including OVID Medline, CINAHL, the Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. The search was also limited to English language documents published between January 1, 2014 and April 17, 2019. Internet links were provided, where available.

## Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

**Table 1: Selection Criteria**

<b>Population</b>	Critically ill patients (i.e., patients in an intensive care or critical care unit)
<b>Intervention</b>	Physical restraints
<b>Comparator</b>	Q1: No restraints No comparator Q2: Not applicable
<b>Outcomes</b>	Q1: Accidental or intentional extubation or removal of lines or tubes; hospital length of stay; harms related to restraints (e.g., agitation, emotional problems, PTSD, pressure injury) Q2: Evidence-based guidelines
<b>Study Designs</b>	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, evidence-based guidelines

## Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

Two systematic reviews and one non-randomized study were identified regarding physical restraints for the prevention of self-extubation, line, or tube removal in critically ill patients. No relevant health technology assessments, randomized controlled trials, or evidence-based guidelines were identified.

Additional references of potential interest are provided in the appendix.

## Overall Summary of Findings

Two systematic reviews<sup>1-2</sup> and one non-randomized study<sup>3</sup> were identified regarding physical restraints for the prevention of self-extubation, line, or tube removal in critically ill patients. The authors of the first systematic review found that the effectiveness of physical restraints in preventing self-extubation in the intensive care unit was questionable, and that there are many flaws in the administration of physical restraints with inconsistencies in protocol and lack of training provided to nurses.<sup>1</sup> Authors of a second systematic review found that unplanned extubations in intensive care units were significantly associated with the use of physical restraints among other factors.<sup>2</sup> In addition, authors of a non-randomized studies found that physical restraint was significantly associated with higher likelihood of unplanned extubations.<sup>3</sup>

## References Summarized

### Health Technology Assessments

No literature identified.

### Systematic Reviews and Meta-analyses

1. Perez D, Peters K, Wilkes L, Murphy G. Physical restraints in intensive care-An integrative review. *Aust Crit Care*. 2019 Mar;32(2):165-174.  
[PubMed: PM29559190](#)
2. Ai ZP, Gao XL, Zhao XL. Factors associated with unplanned extubation in the Intensive Care Unit for adult patients: A systematic review and meta-analysis. *Intensive Crit Care Nurs*. 2018 Aug;47:62-68.  
[PubMed: PM29653888](#)

### Randomized Controlled Trials

No literature identified.

## Non-Randomized Studies

3. Chuang ML, Lee CY, Chen YF, Huang SF, Lin IF. Revisiting Unplanned Endotracheal Extubation and Disease Severity in Intensive Care Units. *PLoS ONE*. 2015;10(10):e0139864.  
[PubMed: PM26484674](#)

## Guidelines and Recommendations

No literature identified.

## Appendix — Further Information

### Previous CADTH Reports

4. Avoidance of physical restraint use among hospitalized older adults: A review of clinical effectiveness and guidelines. (CADTH rapid response report: summary with critical appraisal). Ottawa: CADTH; 2019.  
<https://www.cadth.ca/avoidance-physical-restraint-use-among-hospitalized-older-adults-review-clinical-effectiveness-and> Accessed 2019 Apr 29  
*See: Table 10: Summary of Recommendations in Included Guidelines*
5. The use of restraints and excited delirium or positional asphyxia: A review of the safety and guidelines. (CADTH rapid response report: summary with critical appraisal). Ottawa (ON): CADTH. 2016.  
<https://www.cadth.ca/use-restraints-and-excited-delirium-or-positional-asphyxia-review-safety-and-guidelines> Accessed 2019 Apr 29

### Non-Randomized Studies – Predictors of Physical Restraint Use

6. Luk E, Sneyers B, Rose L, et al. Predictors of physical restraint use in Canadian intensive care units. *Crit Care*. 2014 Mar 24;18(2):R46.  
[PubMed: PM24661688](https://pubmed.ncbi.nlm.nih.gov/24661688/)

### Qualitative Studies

7. Danielis M, Chiaruttini S, Palese A. Unplanned extubations in an intensive care unit: Findings from a critical incident technique. *Intensive Crit Care Nurs*. 2018 Aug;47:69-77.  
[PubMed: PM29776707](https://pubmed.ncbi.nlm.nih.gov/29776707/)
8. Farina-Lopez E, Estevez-Guerra GJ, Polo-Luque ML, Hanzelikova Pogranyiva A, Penelo E. Physical Restraint Use With Elderly Patients: Perceptions of Nurses and Nursing Assistants in Spanish Acute Care Hospitals. *Nurs Res*. 2018 Jan/Feb;67(1):55-59.  
[PubMed: PM29240661](https://pubmed.ncbi.nlm.nih.gov/29240661/)
9. Huang HC, Huang YT, Lin KC, Kuo YF. Risk factors associated with physical restraints in residential aged care facilities: a community-based epidemiological survey in Taiwan. *J Adv Nurs*. 2014 Jan;70(1):130-143.  
[PubMed: PM23734585](https://pubmed.ncbi.nlm.nih.gov/23734585/)

### Review Articles

10. Bourn S. Complications of unplanned extubation: recognition and prevention. Highlands Ranch (CO): Securisyn Medical. 2018. <https://www.securisyn.com/s/White-Paper-Complications-of-UE062218.pdf> Accessed 2019 Apr 29  
*See: Prevention of unplanned premature extubation begins with securement, page 4*
11. Morii C. Prevention strategies for unplanned extubation in NICU – A literature review. *Jof Neonatal Nurs*. 2016;22(3):91-102.  
[PubMed: PM115216624](https://pubmed.ncbi.nlm.nih.gov/115216624/).

## Additional References

12. Mitchell DA, Panchisin T, Seckel MA. Reducing Use of Restraints in Intensive Care Units: A Quality Improvement Project. *Crit Care Nurse*. 2018 Aug;38(4):e8-e16.  
[PubMed: PM30068727](#)