

## Introduction

Accurate models are a fundamental prognostic tool for risk stratification, therapy guidance, resource allocation, and comparative effectiveness research. Enhanced recovery after surgery (ERAS) protocols are programs developed to increase early post-operative recovery rates in surgical patients. Due to the unique nature of burn injuries and post-operative care, there is a need to develop a protocol unique to burn surgery, enhanced recovery after burn surgery (ERABS). In order to develop such a protocol, we need to examine multiple post-operative practices of care like time-to-ambulation and its effect on post-operative complications.

## Objectives

Our study aims to evaluate the current evidence supporting complications such as graft loss, thrombolytic events, and pain relating to the timing of post-surgical ambulation. This study will assess the literature that is currently available and expose areas that require further research.

## Materials and Methods

Extensive online literature search of PubMed, Embase, Cochrane, and Web of Science databases on early ambulation and skin grafting was performed by two independent researchers. Due to the lack of literature available, no time limit was set for publication dates. Search terms were utilized to capture the relevant studies relating to ambulation of adult burn patients (>18 years of age) and their post-surgical outcomes.

## Results

Out of the 888 studies retrieved from the search query, 15 were eligible for systematic review and meta-analysis. The review process followed Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) and Cochrane guidelines. Our review revealed that almost no evidence exists relating thromboembolic events and time-to-ambulation in post-operative burn patients. The evidence that does exist found no significant difference in the number of events between early and late ambulation groups. Patients with delayed ambulation, after 5 or more days were found to have increased pain levels at rest ( $P = 0.02$ ) and when ambulating ( $P = 0.08$ ). One study found increased infection rate in late ambulatory patients ( $P = 0.22$ ).

	Early Ambulation (<5 days post-op)	Late Ambulation (5< days post-op)
Pain (resting)	-	Increased ( $p=0.02$ )
Pain (ambulating)	-	Increased ( $p=0.08$ )
Rate of Infection	-	Increased ( $p=0.22$ )

Figure 1 – Statistically Significant Findings

	Early Ambulation (<5 days post-op)	Late Ambulation (5< days post-op)
Hospital LOS (average)	7.43 +/- 5.8	12.93 +/- 2.7

Figure 2 – Findings (not statistically significant)

Mean %TBSA	4.82 +/- 4.3
Mean Age (Early Ambulation)	45 +/- 12.4
Mean Age (Late Ambulation)	46.73 +/- 13.3
Sex	50.38% (M) 49.62% (F)
Mean Sample Size	70 +/- 53

Figure 3 – Demographics

## Conclusion

The primary conclusion from this review is that further, extensive, prospective randomized control studies need to be performed examining the correlation of thromboembolic events and infection rates with post-operative time-to-ambulation. Based on current literature, early ambulation should be included as part of a future model of ERABS because a shorter length-of-stay lowers the risk for hospital acquired infection. Also, decreased associated pain levels could lead to decreased risk for opioid dependence.

## Continuing Research

Early ambulation as part of ERABS is only a step in the process. Similar systematic reviews and meta-analyses will be developed for each step in the pathway. Along with the results from clinical research, an efficient algorithm can be formulated.