

When to cut? Differences in outcomes between immediate, ultra-early, and early excision of burn wounds $\geq 20\%$ TBSA

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Background

Primary surgical intervention of large burns mandates **surgical excision** followed by skin grafting. **Delayed excision** post-injury is thought **to allow** for **resuscitation** and **correction of physiologic derangements**.

Precise **optimal timing** for burn wound excision has **not been determined** and remains controversial. Our previous research involving **animal models** and a **systematic review** suggests a **possible clinical superiority** associated **with immediate/ultra-early** excision.

Purpose

To **assess** whether there is a **difference in outcomes** if initial excision is performed **immediately** (<24 hours), **ultra-early** (24-72 hours), or **early** (3-7 days) in adults with burns-related injuries of $\geq 20\%$ TBSA.

Materials and Methods

Retrospective review of **1035 adults** admitted from **2016-2021**.

Stratified our study groups based on their time to initial excision: **Immediate** (<24 hours), **Ultra-Early** (24-72 hours), and **Early** (3-7 days).

We assessed blood-loss during initial surgery, transfusion requirements, pain-levels, daily analgesic requirements, hospital-acquired complications, readmission rates, hospital length-of-stay (LOS), and mortality.

Results

	Immediate (n = 10)	Ultra-Early Excision (n = 63)	Early Excision (n = 26)	P-Value
Age (y)	49.8	50.7	50	NS
Sex	Male (70%), Female (30%)	Male (58.2%), Female (61.8%)	Male (52.3%), Female (67.7%)	NS
%TBSA	34.3	41.4	35	NS
Time-to-Excision (hours)	<24 (<1 day)	56.9 (2.37 days)	105.1 (4.38 days)	<0.01*
Blood-Loss (mL)	455	897.3	561.1	<0.05*
pRBC transfused (mL)	562.5	996.2	585	<0.05*
Total Surgeries Performed	5.22	7.01	6.65	NS
Pain Score	3.55	5.58	5.65	<0.05*
Analgesic Requirements (MME)	42.75	77.18	68.9	<0.05*
Hospital-Acquired Complications (%)	60	56.7	45	NS
30-Day Readmission (%)	0	8.9	11	<0.05*
Hospital LOS (days)	36.2	57.88	42.05	<0.05*
Mortality (%)	20	22.3	4.76	<0.05*

Table 1: Patient demographics and outcomes

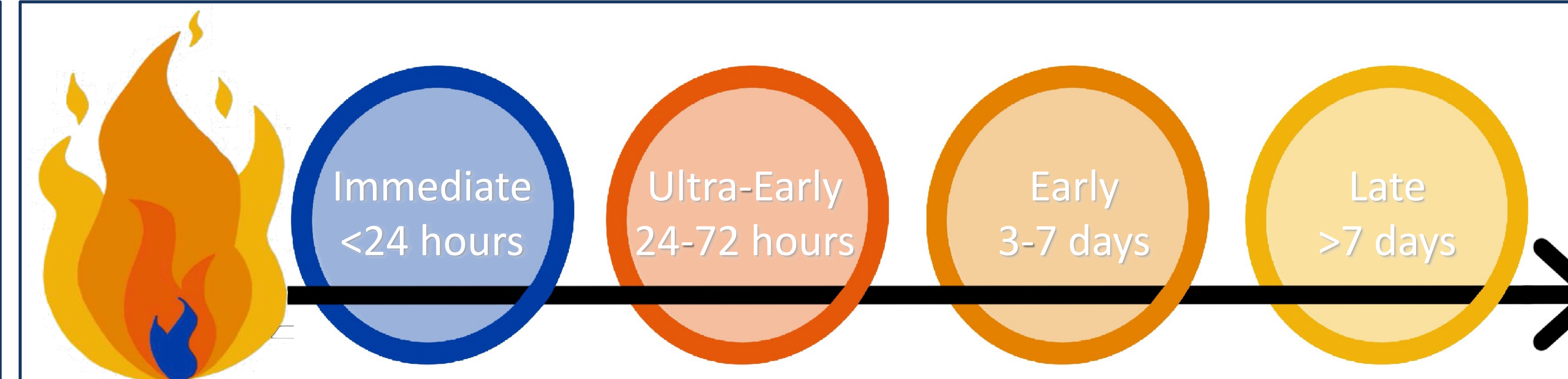


Figure 1 – Timing of burn excision and grafting from onset of burn

Out of **1035 adults** admitted to our burn center, **136** were found to have injuries of $\geq 20\%$ TBSA and **99** required **surgical excision and grafting**.

99 patients showed **10 patients** in the **immediate** group, **63 patients** in the **ultra-early** group, and **26 patients** in the **early** group.

Patient in in the **ultra-early** group were found have **higher** amounts of intraoperative **blood loss**, **transfusion requirements**, **analgesic requirements**, **30-day readmission rates**, a **longer hospital length-of-stay**, and **higher mortality rates**.

Conclusion

Data suggests **bimodal optimal time** for initial excision and grafting, within 24 hours of injury or after 72 hours.

Ultra-early excision group seems to have **worse outcome** for **blood loss**, **transfusion requirements**, **analgesic requirements**, **LOS**, and **mortality**.

Immediate excision group may have **favorable outcomes** due to the **removal of the inflammatory nidus before systemic dysfunction**. **Early excision** group have **favorable outcomes** to due **resolution and stabilization of the hemodynamic and inflammatory status**.

Based on our data, **immediate** and **early** excision and grafting of burn wounds are **superior to ultra-early**.

Results strongly argue in favor of a **randomized, controlled trial** to help **define the optimal timing** of burn wound excision.