

# Outpatient Laser Treatment for Burn Scars is Safe and Effective

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# Outpatient Laser Treatment for Burn Scars is Safe and Effective



Figure 1A and 1B. Patient shows significant improvement in scar appearance after 5 laser treatments.

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## INTRODUCTION

- Introduced in 1997 for the treatment of cutaneous lesions, lasers have been added to the armamentarium for the treatment of hypertrophic burn scars. Studies demonstrating the efficacy of laser treatments on scar appearance have been published. In 2015, our burn center published a prospective efficacy study about laser treatments that showed significant improvement.
- Since 2012, the burn center outpatient clinic has performed over 1,500 laser treatments. This number far exceeds any previous cases in studies exploring laser treatments. This is a preliminary collection of patients who have had at least one laser treatment between January 1, 2016 and May 1, 2018.

## PURPOSE

- The purpose of the study is to determine if laser treatments are a safe and effective treatment option for burn scars.

## METHODS

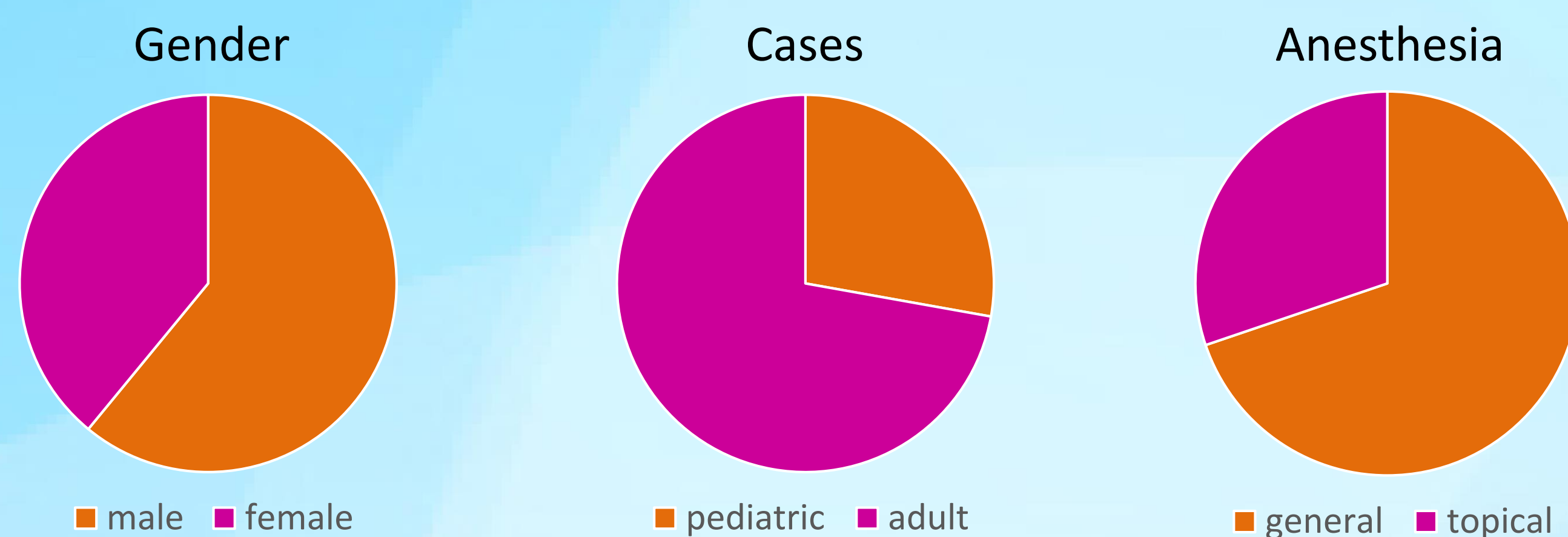


Figure 2A, 2B, and 2C. Patient demographics. 1A shows patient gender, 1B shows type of case, and 1C shows whether patient underwent general or topical anesthesia prior to treatment.

- 187 patients with surnames of A-L who have had at least one laser treatment in the burn center outpatient clinic between 1/1/16 and 5/1/18 were analyzed.
- We looked at 868 laser treatments and collected variables such as pain, Vancouver Scar Scale, and complications in EPIC.
- The data was entered in REDCap.
- After finishing collection, the data was exported to Microsoft Excel, where statistical tests were performed.

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## RESULTS

Table 1	TBSA	Patients with skin graft	Size of treated scar (cm <sup>2</sup> )	Duration of anesthesia recovery (min)
Average	14.2%	60%	561	27.3

Table 2	Patients using ablative fractional laser	Energy (mJ)	Density (spots/cm <sup>2</sup> )	Total energy (J)
Average	53.6%	160	111	5414

Table 3	Patients using non-ablative fractional laser	Energy (mJ)	Density (spots/cm <sup>2</sup> )	Total energy (J)
Average	39.3%	48	295	2067

Table 1. Averages of scar-related variables. TBSA is total burn surface area.

Table 2. Averages of laser settings for patients who underwent an ablative fractional laser for treatment.

Table 3. Averages of laser settings for patients who underwent a non-ablative fractional laser for treatment.

Note: IPL, Q-switched and multi-spot laser settings averages not shown because sample sizes were low.

- Pediatric cases are more likely to use general anesthesia and therefore have a higher total number of anesthesia complications than adult cases.
- The following graphs and charts demonstrate our findings:

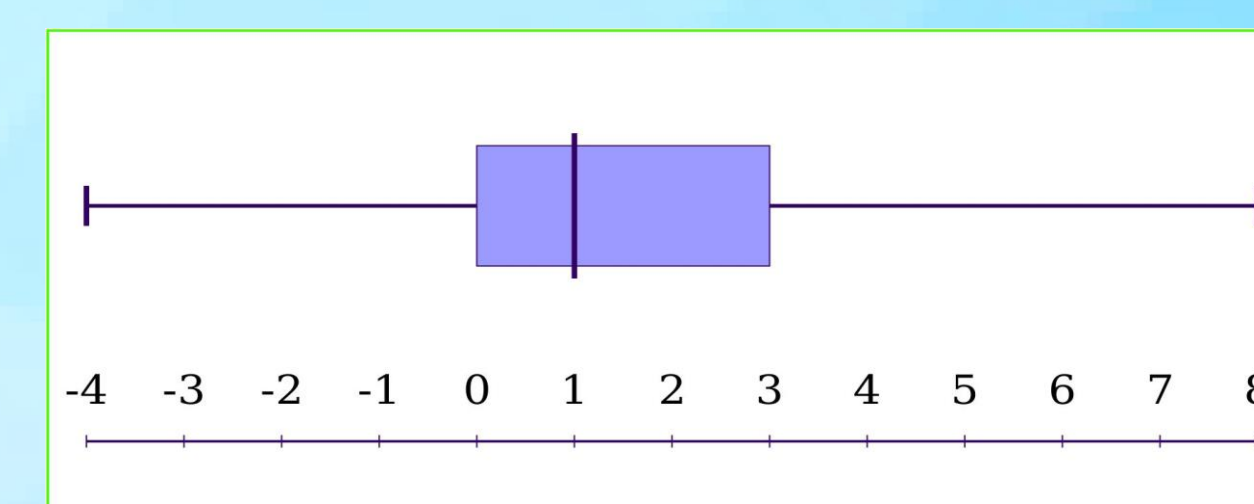


Figure 3. Vancouver Scar Scale improvement after laser treatments for each patient.

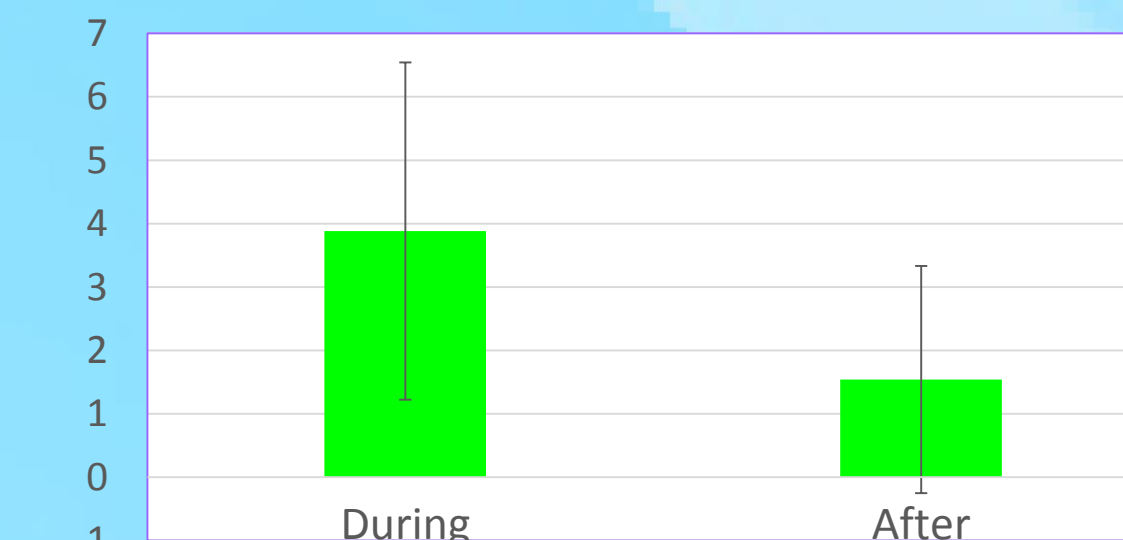


Figure 4. In patients without general anesthesia, perceived pain from a scale of 1-10 reported by the patient during and about 5 minutes after the procedure.

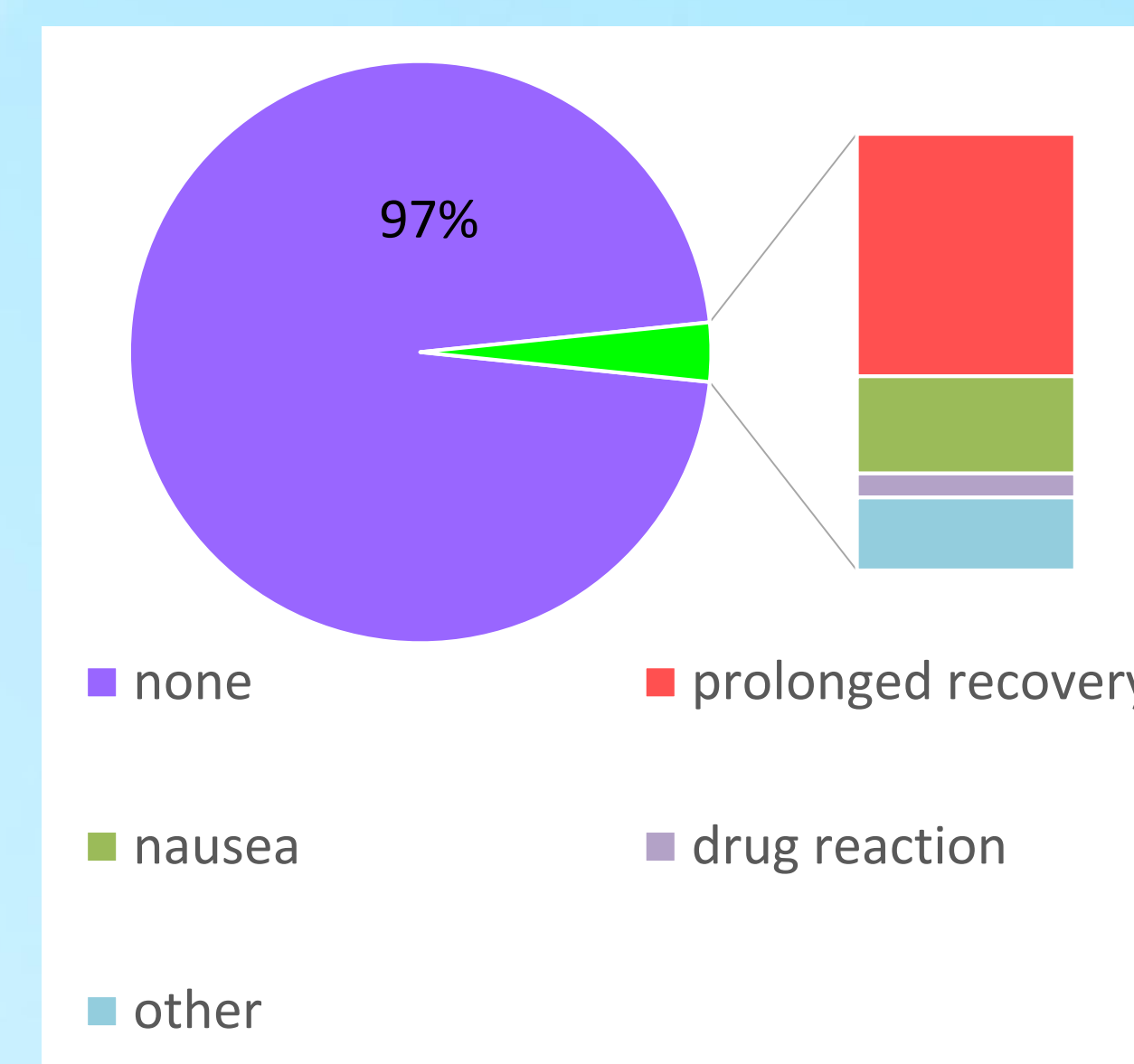


Figure 5. Complications resulting from general anesthesia.

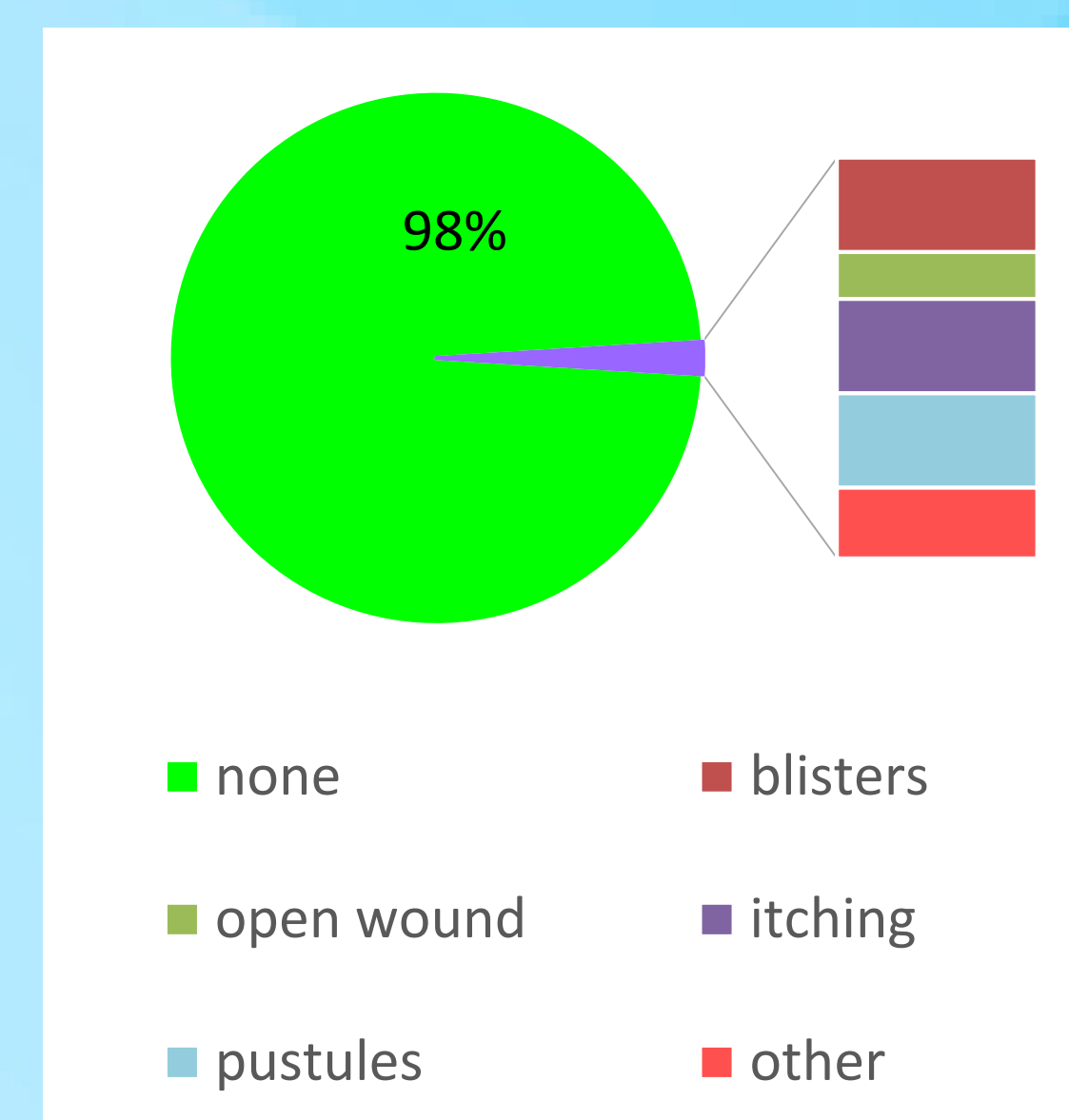


Figure 6. Post-operative complications resulting from the laser treatment.

## DISCUSSION

- The post-operative complication rate for laser treatments with and without general anesthesia is minimal, at 3% and 2% respectively. This shows that laser treatments for scars in the outpatient setting are safe in all age groups and scar sizes.
- The pain during and after the procedure averaged at 3.9 and 1.5 respectively. Assuming the scar that will be treated is smaller in size, topical anesthesia is a good alternative to general anesthesia in smaller scars.
- Although Vancouver Scar Scale (VSS) showed modest improvement in scar appearance over time, it is not a good way to determine the efficacy of scar treatments. The VSS is very subjective and easily prone to mistakes. As shown in previous studies, the VSS often does not correlate with objective measurements.
- Patient and Observer Scar Assessment Scale (POSAS) is not shown in the results because there were only 3 before and after samples available. Average improvement was 12 points out of 60 possible, representing great patient satisfaction with scar treatment. POSAS should be used more frequently than VSS because it represents the patient's satisfaction with the scar, which is ultimately the most important parameter.

## CONCLUSION

- This study, along with others, has demonstrated that laser treatments are an effective method for improving burn scar appearance.
- The perceived complication rate of laser treatments is low, and should not be a significant factor when assessing whether an individual should undergo laser treatments.
- The remaining records will be added to the database.
- Patient interviews including the POSAS 3 months after the final treatment should be documented in the future.