



## Saw Stop Strip can lower your incidence of cuts and burns during cast removals

**Saw Stop Strip reduces injuries significantly, even with experienced users, based on two independent studies.** Saw Stop DE-FLEX protective strips are tough, waterproof, flexible ribbons that provide an added layer of protection from a cast saw.



# Reducing Cast Complications in a Pediatric Hospital

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We focused our efforts on improving application and removal techniques, along with dedicated education strategies for our providers with the goal of decreasing the overall complication rate to 1 complication per 1,000 casts applied.

## INTRODUCTION

In orthopedic practice, casts are frequently used as a routine treatment for traumatic injuries and various musculoskeletal pathologies. Casts are applied and removed by orthopedic residents in training, physician extenders (AHP) such as nurse practitioners or physician assistants, cast technologists, and attending surgeons. Complications can occur during cast application, throughout the immobilization process, and during cast removal.

### Potential Causes For Complications:

- Improperly or irregularly applied padding
- Insufficient padding leading to sharp edges
- Aggressive molding
- Hot water to activate casting material
- Cast saw use during removal

The incidence of skin complications in children treated with hip Spica casts occurs anywhere from 15% to 38% of the time. Cast saw injuries occur at a rate of 1.23 per 1,000 cast removals (0.12%) in a large pediatric institution, compared to 0.72% rate of cast saw cuts or burns in an adult fracture clinical setting.

## BACKGROUND

Nationwide Children's Hospital applies more than 9,000 casts each year. Baseline rate of casting complications 5.6 complications per 1,000 casts applied (0.56%)

**Categories of Complications:** determined using Pareto Principle:

- Cast Saw Burns - 22 (91.7%)
- Pressure Ulcers - 2 (8.3%)
- Other - 0 (0%)

## POLICIES AND PROCEDURES

- **Require AquaCast Saw Stop DE-FLEX Protective Strip applications when casting.**
- **Require certified training of residents and cast technicians.**

## RESULTS

### Phase 1: July 2015-April 2016

- Interventions accomplished a significant change in the system and its performance, with our **mean rate reduced by 71.35%** to 1.61 complications per one thousand applications ( $P < 0.01$ ) from July 2015 to April 2016.

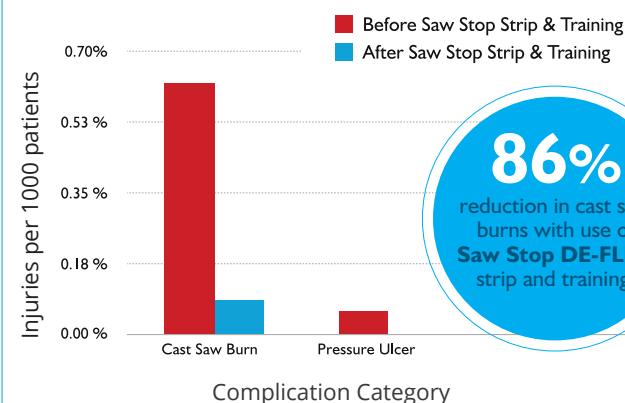
### Phase 2: May 2016- January 2017

- As providers received feedback from the project lead and continued to hone their already improved techniques, the mean rate continued to drop. Our sustainment period showed **continued success with an additional reduction of 90.68% ( $P < 0.01$ ) compared to Phase 1, and 97.33% ( $P < 0.01$ ) when compared to baseline.**

## CONCLUSION

The dedicated education strategies surrounding cast application and removal techniques proved an effective improvement intervention.

### CAST COMPLICATIONS BY CATEGORY



Balch Samora J, Samora WP, Dolan K, Klingele KE. A quality improvement initiative reduces cast complications in a pediatric hospital. *Journal of Pediatric Orthopedics*. 2018 Feb; 38(2):e43-e49.



# To Cast, to Saw, and Not to Injure: Can Safety Strips Decrease Cast Saw Injuries?

Natalie C. Stork MD, Rachel L. Lenhart PhD, Blaise A. Nemeth MD, MS, Kenneth J. Noonan MD, Matthew A. Halanski MD

Use of the safety strip placed between the padding layers decreased the number of simulated skin touches compared with casts without the safety strip present among experienced users and inexperienced users.

## SUMMARY

Physicians at the Children's Mercy Hospital in Kansas City, the University of Missouri-Kansas City School of Medicine and the University of Wisconsin School of Medicine and Public Health were concerned with the number of patients being injured during cast removal. They hypothesized that adding a protective strip to the cast could reduce the number of injuries. They also questioned if the addition of a protective strip would prevent the release of pressure when a cast is split. In this study they used engineering and medical techniques to test their hypothesis.

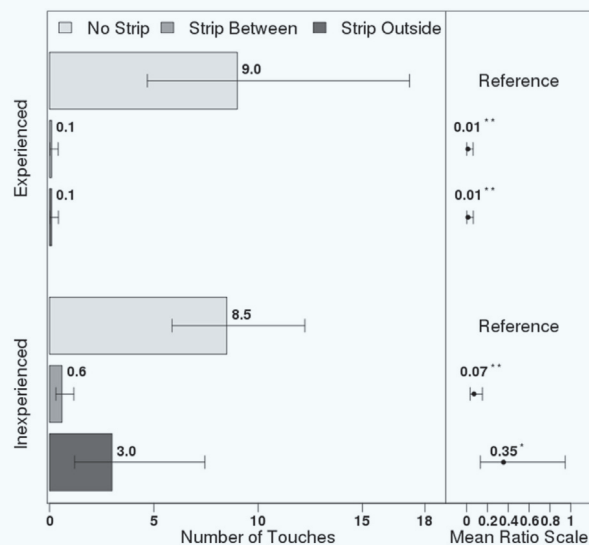
## DISCUSSION

We found that a safety strip incorporated in the cast construct resulted in fewer simulated blade-to-skin touches by the oscillating cast saw, lessened heat transfer, and did not inhibit the release of pressure that occurs when casts were univalved or bivalved.<sup>1</sup>

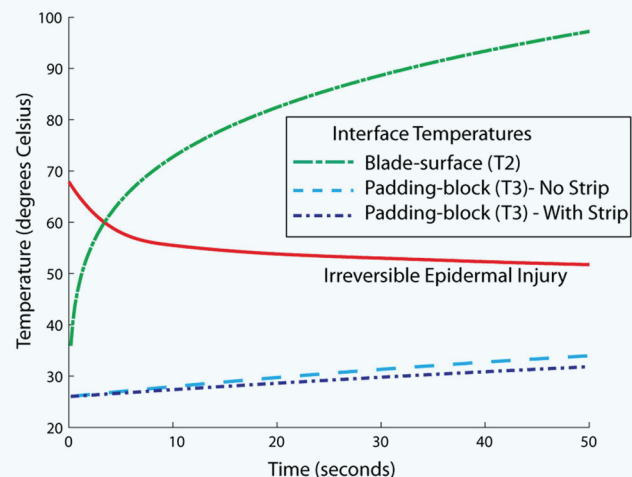


**Fig. 1:** Six pediatric upper extremity models are shown

1. Natalie C. Stork MD, Rachel L. Lenhart PhD, Blaise A. Nemeth MD, MS, Kenneth J. Noonan MD, Matthew A. Halanski MD. To Cast, to Saw, and Not to Injure: Can Safety Strips Decrease Cast Saw Injuries?. *Clinical and Related Research*. 2016 Feb; 474(7): 1543–1552.



**Fig. 2:** The mean touches based on condition are shown. The presence of the safety strip decreased the blade-to-skin contact events. \*Significant at 0.05, \*\*significant at 0.001.



**Fig. 3:** A time-temperature graph shows that even at high cast saw temperatures, there is minimal heat transfer. Temperatures under the padding are less than the threshold for irreversible epidermal injury (solid red line).