



# Clinical and Economic Burden of Facial Trauma in the Incarcerated Population

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## ABSTRACT

**Objectives:** Incarcerated patients represent a special subset of facial trauma patients. Our institution is distinctive as a level I trauma center and provider of specialized services to the incarcerated. We previously established that 12.2% of prisoners presenting to our emergency department (ED) with facial trauma in the 2013 calendar year, accounting for 8.6% of all prisoner visits. We analyzed all otolaryngology consults for facial trauma in incarcerated patients presenting to the ED in 2013 to characterize patient visits and identify potential areas for cost and resource savings.

**Study Design:** Retrospective review of ED visits during 2013 calendar year.

**Methods:** Billing data identified patients seen for facial trauma and receiving otolaryngology consults. Information about transfer from outside facility, nature of trauma, timeline from injury to repair, and followup was recorded. Costs were determined using average nationwide Emergency Department data.

**Results:** The 28 presenting complaints to our service included: facial fracture (26), complex laceration repair (1), and nerve injury (1). Ten patients were transferred from an outside facility. 11 patients underwent surgical intervention with 9 repaired within 14 days of injury. No patients required emergent surgery. Costs for the entire cohort were estimated at \$202,278.

**Conclusions:** Facial trauma is a significant cause of morbidity and economic burden in the incarcerated population. In our series, no trauma warranted immediate intervention. Identifying surgical candidates remotely could result in significant cost and resource savings.

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## INTRODUCTION

Trauma and facial injury is a common presenting complaint at tertiary care emergency facilities. This is particularly true at our institution, which serves at the sole Level I trauma center for 16 counties in New York. Additionally, as an academic medical center with the otolaryngology service managing all facial trauma, our institution is a rich source of information about facial trauma and management. With the move toward privatized healthcare in the prison system, our institution is also one of few academic medical centers in the country to treat a large population of prisoners.

Timing of and indications for facial fracture repair are relatively well established. However, determining the best way to evaluate these patients remains to be determined. This is particularly true within the incarcerated population, which incurs additional costs for transportation, planning, and appropriate escort and monitoring services for each Emergency Department (ED) visits.

This study seeks to better characterize the nature of facial trauma in the prisoner population, to describe costs, and to identify areas for cost and resource savings.

## METHODS AND MATERIALS

Prisoner patients were identified using billing data from the year 2013.

Analysis of medical records identified patients seen of facial trauma and receiving otolaryngology consults.

Information about age, nature of trauma, transfer from outside facility, timeline from injury to repair, and follow-up was recorded.

Costs were determined using average nationwide emergency department data in order to avoid any bias from existing payment contracts.

## IMAGES

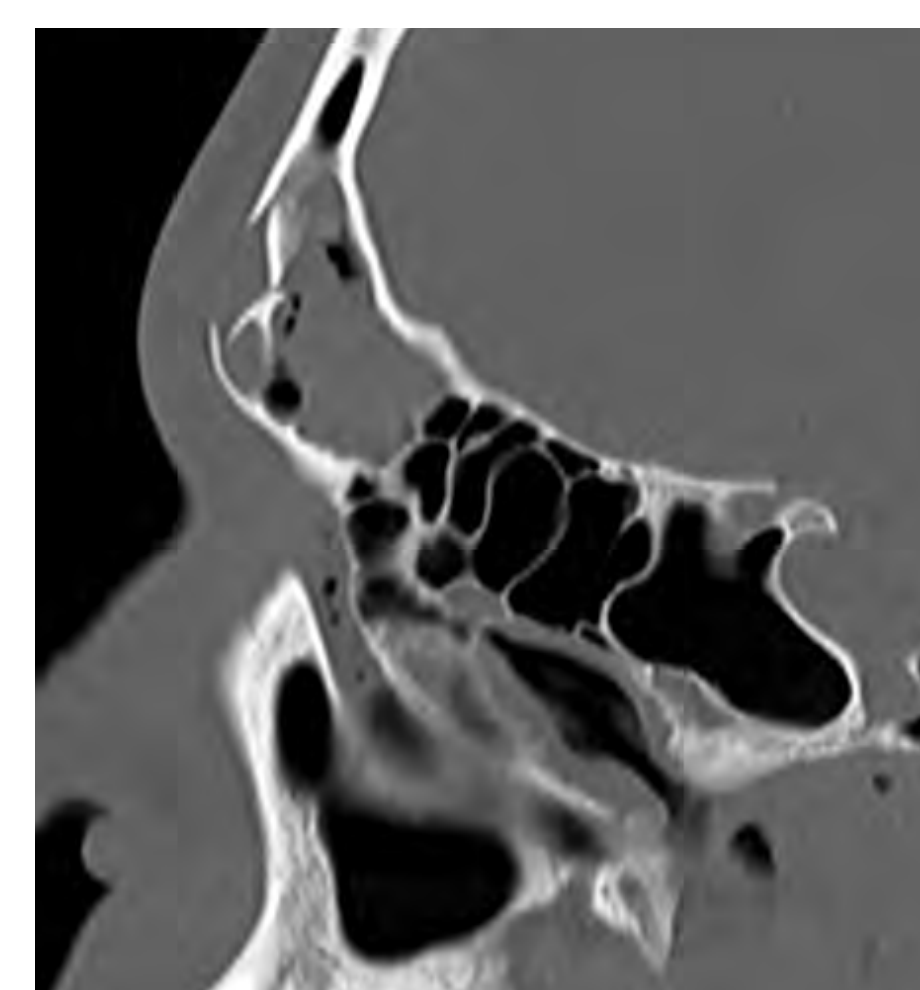


Figure 1. Anterior Table Fractures



Figure 2. Mandible Fractures

## RESULTS

The 28 presenting complaints to our service included:

- Facial fracture
  - Mandible (10)
  - Orbit (10)
  - Nasal bones (6)
  - Sinus (3)
  - ZMC (3)
  - Lamina papyracea (2)
  - Pterygoid (1)
- Complex laceration repair (1)
- Nerve injury(1)

Ten patients (35.7%) were transferred from an outside facility.

- 70% did NOT require surgery
- 10.7% underwent repeat imaging for logistical issues (prior images not accessible)

Eleven patients underwent surgical intervention.

- 9 fractures were repaired within 14 days of injury.
- No patients required immediate surgery.

Cost estimates are listed in Table 1. Total costs account for the ten visits to outside facilities.

- Costs for the entire cohort total \$202,278.
  - These estimates do not account for the cost of transportation, security, or follow-up care.

	Number of Patients	Average Cost per patient	Total Cost (including cost from outside facilities)
Facial fracture – nonsurgical	15	\$3,192	\$70,224
Facial fracture – surgical	11	\$10,402	\$123,998
Complex Laceration Repair	1	\$3,192	\$3192
Nerve Injury	1	\$7,864	\$7,864
<b>TOTAL</b>			<b>\$202,278</b>

Table 1. Summary of Costs for Prisoners Presenting with Facial Trauma

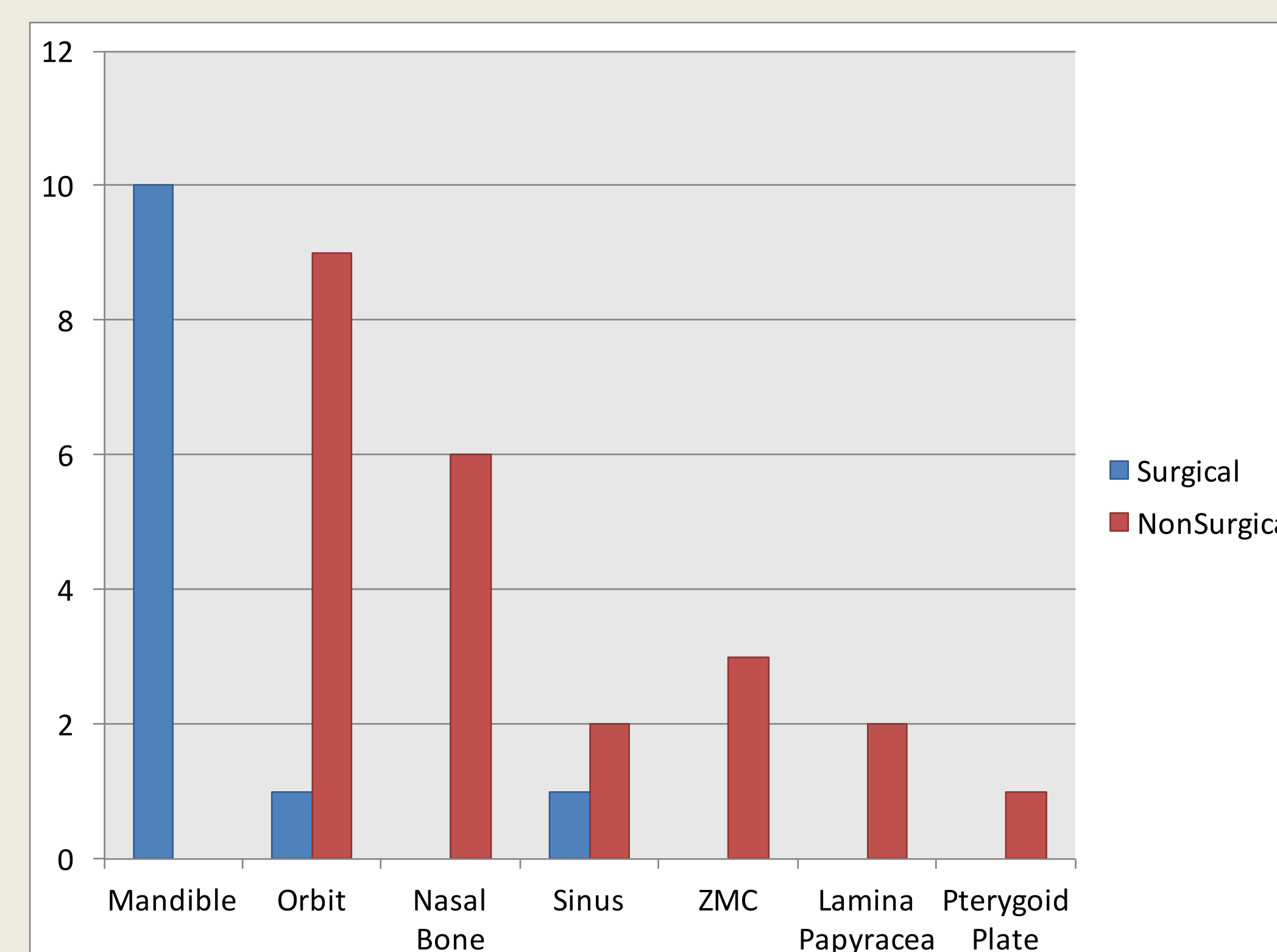


Figure 3. Surgical vs. Nonsurgical Treatment of Facial Fractures.

## DISCUSSION

Facial trauma accounts for a significant component of all prisoner visits to the ED. Of prisoners seen by the otolaryngology service in the emergency room, over one third of patients are transferred from an outside facility for a higher level of care – 10% of these undergo unnecessary repeat imaging.

The vast majority of prisoner facial trauma is non-surgical (60.7%) or non-urgent (100%). Furthermore, repeat imaging is regularly performed, resulting in unnecessary costs and radiation exposure.

In a population where cost-savings is paramount, one potential solution to avoid unnecessary imaging or transfers is Telemedicine. This is already being used in some prisons when subspecialist consults are needed but otherwise logistically difficult. Given the lack of urgent or emergent surgical intervention in our study, timely outpatient follow-up may also be appropriate.



## CONCLUSIONS

Facial trauma is a significant cause of morbidity and economic burden in the incarcerated population. In our cohort, no emergent surgery was required.

One potential solution that is gaining in popularity is Telemedicine. Our future studies will determine the safety and efficacy of remotely evaluating patients with facial trauma. In particular, if facial fractures can be safely triaged remotely, significant savings would result in terms of both financial and human resources.

## REFERENCES

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2. Russo, Allison, et al. "Hospital-based ambulatory surgery, 2007." (2010).