



Demographics, Injury Patterns And Associated Injuries In 3,334 Pediatric Facial Fracture Patients Treated At A Single Institution



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Background

- Pediatric craniofacial fractures account for only 5 to 15 percent of all facial fractures and 4.6 percent of pediatric craniofacial trauma
- Features unique to pediatric facial fractures, such as the presence of unerupted teeth or mixed dentition in children, higher elasticity of the facial bones, the presence of compliant sutures, lower pneumatization of sinuses, and additional protection by the cranium, result in higher force required to produce facial fractures and increased frequency of skull fractures relative to facial fractures
- Facial or skull trauma has uniquely detrimental effects on the growth and development of the cranium in pediatric patients
- Previous pediatric craniofacial fracture studies have been limited by selection criteria
- The goal of this study was to provide a foundation for long-term follow-up and outcomes assessments in order to guide optimal treatment and prevention protocols for pediatric craniofacial fractures

Methods

- A retrospective review was performed of patients under 18 years of age who were evaluated for facial fractures at a pediatric level I trauma center between 2006 and 2021
- All patients with an *International Classification of Diseases, Ninth and Ten revision code* indicative of a facial fracture were identified and patients with isolated skull fractures were subsequently excluded, yielding 3,334 pediatric patients
- Patients were subdivided into three age groups based primarily on dental maturity: under 6, 6 to 12, and 12 to 18 years old
- Variables studied included demographics, etiology, fracture pattern, associated injuries, past medical history, fracture management, and outcomes.
- All patients presenting with a facial fracture, regardless of treating specialty, treatment modality, or inpatient status, were included in this analysis.

Table 1: Patient Characteristics

Patient characteristics	No. (%)
Age, mean (SD)	11.5 (4.7)
Under 6 years old	531 (15.9)
From 6 to 12 years old	1250 (37.5)
Over 12 years old	1553 (46.6)
Sex	
Male	2282 (68.4)
Female	1052 (31.6)
Race	
American Indian	15 (0.4)
Asian	17 (0.5)
Black	461 (13.8)
Other – Pacific Island	1 (0.0)
White	2754 (82.6)
Declined	28 (0.8)
Not specified	33 (1.0)
Unknown	25 (0.7)
Ethnicity	
Hispanic or Latino	14 (0.4)
Not Hispanic or Latino	1929 (57.9)
Declined	31 (0.9)
Unspecified	1360 (40.8)
Mechanism of injury	
Activities of Daily Living	512 (15.4)
Sports	1082 (32.5)
Violence	378 (11.3)
Play	409 (12.3)
Motor Vehicle Accident	476 (14.3)
Bicycle/Scooter/Non-motorized vehicle	287 (8.6)
Hunting	1 (0.0)
Farming	31 (0.9)
Working	1 (0.0)
Other	79 (2.4)
Past Medical History	
Psychiatric	259 (7.8)
Medical	775 (23.2)
Surgical	550 (16.5)
Treatment	
Reduction in the emergency room	47 (1.4)
Operative treatment	1612 (48.4)
Admission	
Non-ICU admission	1080 (32.4)
ICU Admission	208 (6.2)

SD, standard deviation; ICU, Intensive Care Unit

Results

Figure 1: Cause of Injury by Age

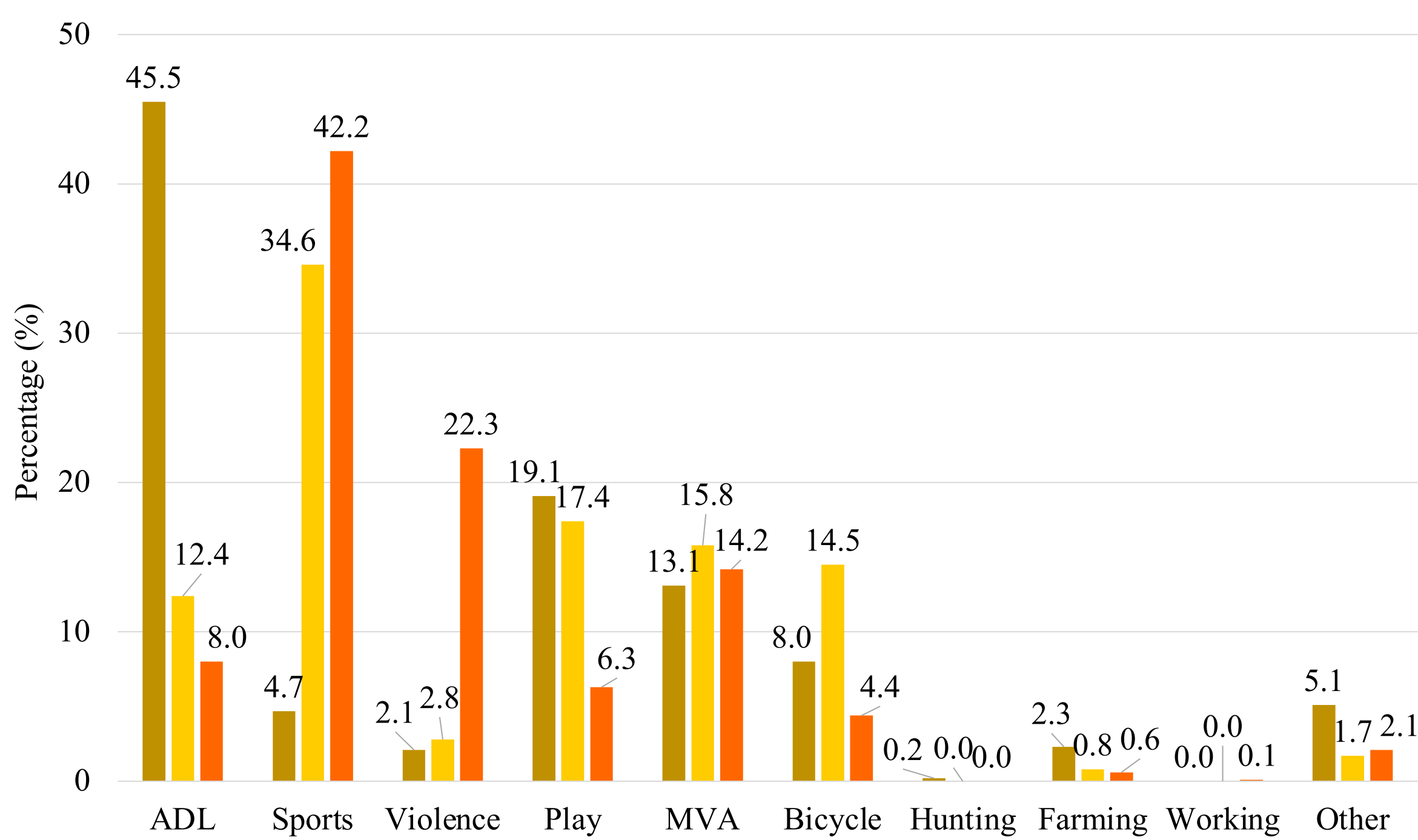


Figure 3: Fracture Type by Age

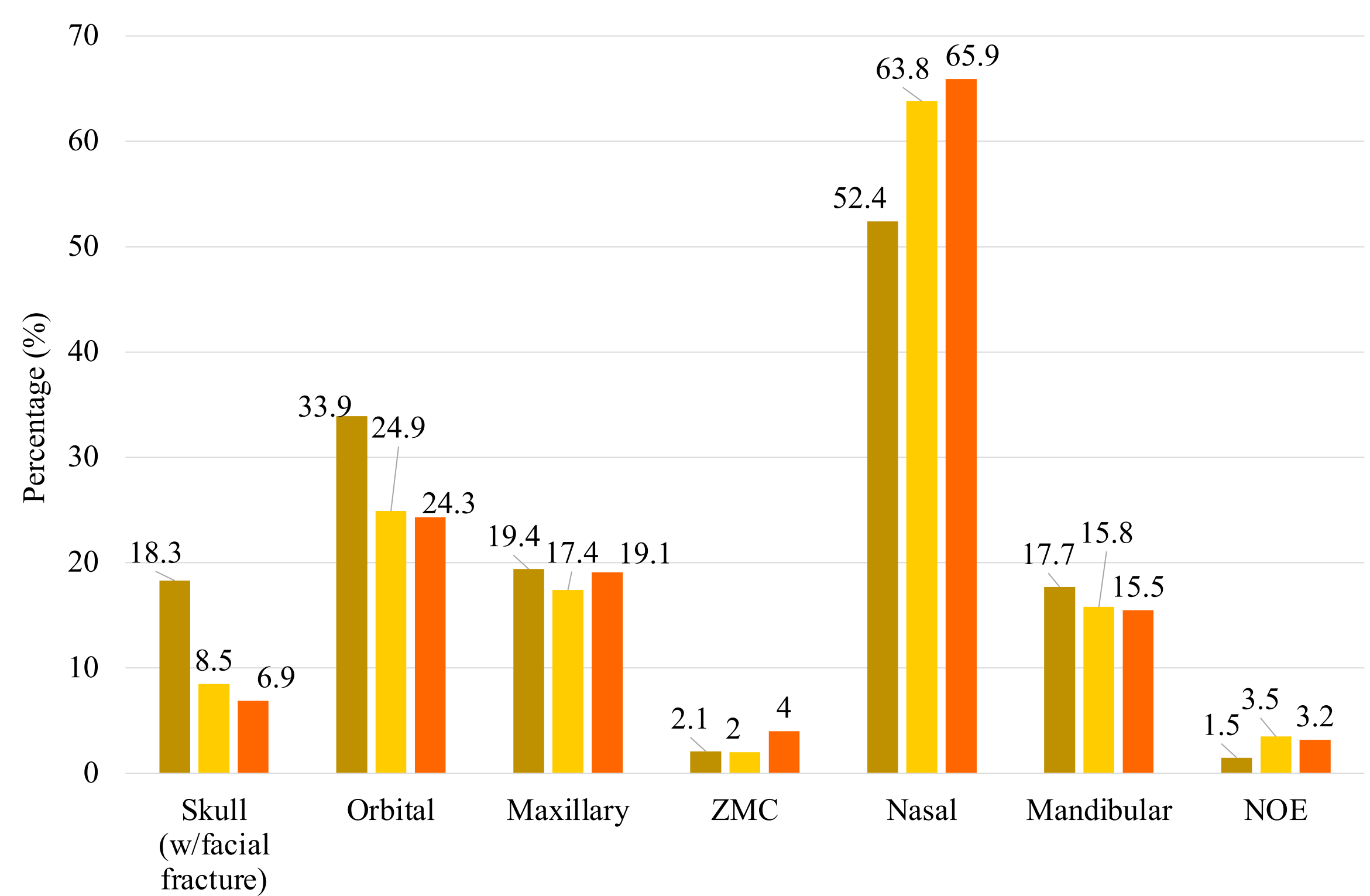
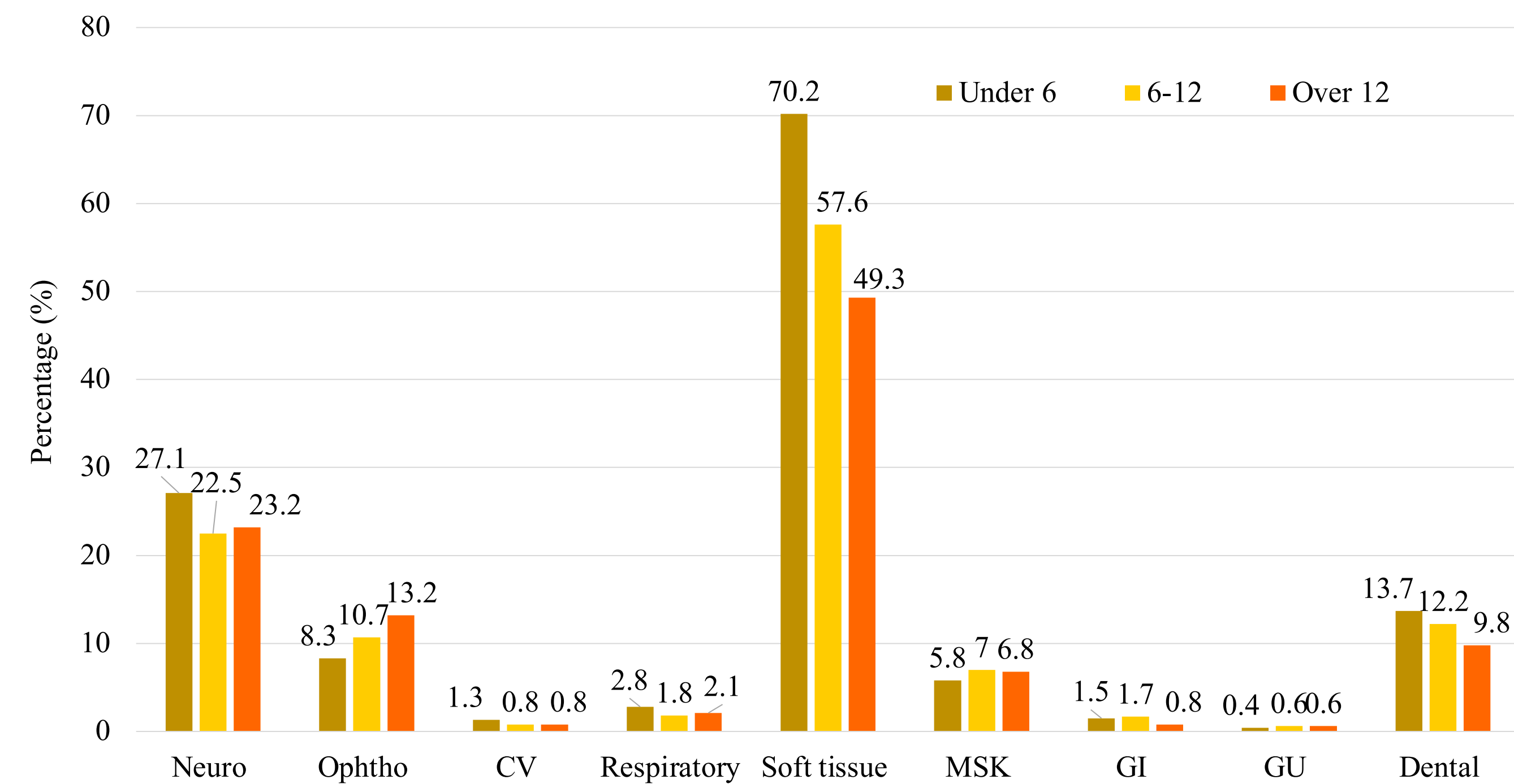


Figure 2: Associated Injuries by Age



Conclusions

- Pediatric facial fractures may present with a variety of associated injuries, particularly neurologic injuries
- Distinct fracture patterns, patient demographics, and mechanisms of injury may be associated with unique concomitant injuries
- Large scale studies of the patterns of injury seen in pediatric craniofacial fracture patients are important for performing accurate outcomes assessments for these unique fractures