

Incidence Outcome and Health Care Utilization of Dog Bites at Children's Hospital Colorado

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Introduction

Dog bites in children have always been a major problem in the U.S. and other parts of the world where children and dogs coexist in the same household. The most common location of dog bites in young children is the head and neck region, which happens in approximately 82% of attacks¹.

Considerable surgical reconstruction is required to repair injuries to the head and neck area that calls for different surgical services including ENT, ophthalmology, and plastic surgery. Along with implants, grafts, and other costly materials, repairing a child's face is of high importance to prevent physiological and psychological trauma in the victims as they grow older².

Little literature exists on the health care utilization required for dog bites in children to the head and neck area. The aim of this study was to find out what hospital services/resources are required for complete healing/treatment of the dog bite victim, the dog breeds more commonly causing the injuries, and the infection rates of dog bites.

Materials and Methods

The Colorado Multiple Institutional Review Board (COMIRB) reviewed and approved this research study (COMIRB #: 18-2711).

A retrospective review was performed for all pediatric patients with ages from 0-18 years who were seen or treated for dog bite injuries to the head, face, and neck area from at CHCO from January 1st of 2012 to January 1st of 2017.

All patients' charts were retrieved and analyzed by one investigator from EPIC electronic medical record system for demographic data, dog breed, type and location of injury, clinical course before and after hospital discharge, and associated complications. Information was stored in RED cap.

Dog breeds were categorized using the American Kennel Club's groupings, which classifies dog breeds based on the characteristics and functions for which they were originally bred.

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Results

- The most common type of dog involved was "unknown" n=263 (57.2%), not reported during hospital visit.
- The **Sporting types** had the highest rate of bites n= 42 (9.1%). This type of dogs included Golden Retriever (n=4), Labrador Retriever (31), Spaniel (n=6), and Weimaraner (n=1).
- The next highest rate was by the **Working type** n=39 (8.5%). This group type included Akita (n=3), Bernese (2), Boxer (n=6), Bull Mastiff (n=1), Great Dane (n=4), Husky (n=15), Malamute (n=1), Rottweiler (n=6), and Saint Bernard (n=1).
- The **Terrier and Toy types**, which includes Pit Bulls (n=27) and Chihuahuas (n=17) respectively, were the third breed groups with the highest number of attacks (7.6% and 7.2%).

Figure 1- Location and frequency of dog bites

Number on Picture	Head and Neck Area	Frequency
1	Cheek	220
2	Chin	40
3	Ear	37
4	Eye (includes eye, eyelid, eyebrow, infraorbital area)	108
5	Forehead	32
6	Mouth	153
7	Mandible/Maxilla	9
8	Neck	9
9	Nose	95
10	Scalp	18
11	Skull/Temple	7

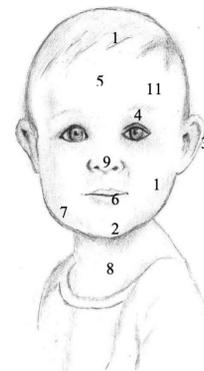


Table 2- Outcomes

	Overall (N=460)
Admitted?	
Yes	73 (15.9%)
No	387 (84.1%)
Location of hospital stay	
Emergency department only	212 (46.1%)
Inpatient floor	67 (14.6%)
ICU (PICU or NICU)	6 (1.4%)
Outpatient clinic	180 (39.1%)
Location of repair	
Repaired in ER without sedation	123 (26.7%)
Repaired in ER with conscious sedation	100 (21.7%)
Repaired in the OR	57 (12.4%)
No repair required	180 (39.1%)
Repaired by	
Emergency department	150 (32.6%)
ENT	78 (17.0%)
Plastics	33 (7.2%)
Ophthalmology/Oculoplastics	23 (5.0%)
Urgent care	14 (3.0%)
Primary care provider	9 (2.0%)
Other	5 (1.1%)
Outcomes	
Evidence of infection	69 (15.0%)
Functional deficits	9 (2.0%)
Psychological effects	4 (0.9%)
Satisfactory	374 (81.3%)
Outcomes Category	
Dentistry Follow-up	1 (0.2%)
Dermatology Follow-up for scar treatment	5 (1.1%)
Emergency Department I&D plus antibiotics	1 (0.2%)
Infections requiring Additional antibiotics	62 (13.4%)

Conclusion

- ❖ Due to physical limitations and natural behavior, children are vulnerable to dog bites to the head and neck area.
- ❖ For most dog bites, treatment at the emergency department by either an emergency physician or a surgical specialist is sufficient but going to the operating room is inevitable in certain extensive dog bite lacerations.
- ❖ Even though the death rate is very low from dog bites, extensive physiological and psychological damage can negatively affect a children's natural development and behaviors.
- ❖ It is important to teach parents and dog owners how to appropriately supervise children-dog interactions. Adults have the capacity to foresee danger, which is something that takes time to develop in young children.
- ❖ Further research and behavioral investigation of the dog-children interaction is required, dog bites can become preventable in young children.

Limitations:

- Results might not be generalizable to the entire nation as Colorado's dog population may need to live mostly inside due to extreme cold conditions on the winter. This fact might precipitate more children-dog bite intercalations.
- Owning some breeds of dogs such as Pit Bulls, was considered illegal in Colorado, which might be the reason that other dog breeds such as Labradors Retrievers were the ones considered causing more bites in patients treated at CHCO.

References

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- 2- Messam, L.L., Kass, P.H., Chomel, B.B., Hart, L.A. (2018). "Factors Associated With Bites to a Child From a Dog Living in the Same Home: A Bi-National Comparison." *Frontiers in Veterinary Science*. Vol.5, no. 66. <https://doi.org/10.3389/fvets.2018.00066>. Accessed 23 Nov. 2018.