



# EFFECTIVENESS OF CRANIAL REMOLDING ORTHOSES IN REDUCING ASYMMETRY IN PATIENTS WITH PLAGIOCEPHALY IN RELATION TO START AGE AND SEVERITY

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## INTRODUCTION

In the mid 1990's the American Academy of Pediatrics instituted the Back-to-Sleep program to reduce the risk of SIDS (Lima, 2002). The program was successful however, the number of infants who developed nonsynostotic plagiocephaly (NP) increased dramatically. Repositioning therapy is an extremely effective way to treat NP, but it does not work in all cases. For those cases where the misshapen skull persists, cranial remolding orthoses (CRO) have become the preferred treatment method. Although there are numerous studies that have concluded CRO treatment is a beneficial intervention for treating NP, there have been studies that refute this claim. (van Wijk, 2014). This current study aims to find more concrete conclusions about the benefits of CRO intervention and when to start CRO treatments. Specifically, the goal of this study is to determine if the overall effectiveness of cranial remolding orthosis in NP is correlated to severity and age at start of treatment.

## METHOD

**Subjects:** Out of 1177 charts reviewed, 218 patients with a diagnosis of NP varying from mild to very severe met the inclusion criteria of the study.

**Procedures:** Researchers collected data from Level-4 P&O clinics using the clinic's patient database.

**Data Analysis:** 4 unbalanced two-way ANOVAs and Excel analysis

## RESULTS

ANOVAs comparing the data revealed that children with mild head shapes and minimal time in the CRO had similar positive outcomes as those who spent extended time in the device. ANOVAs comparing the factors to severity indicated that based upon severity, time plays a significant factor in the overall treatment, with a p value of 0.018. There was not a significant difference found when comparing severity and the age group of each participant. From the final analysis comparing severity to torticollis and prematurity, there was no indication that either of these factors caused a significant impact on the overall severity of the patient at the start of treatment.

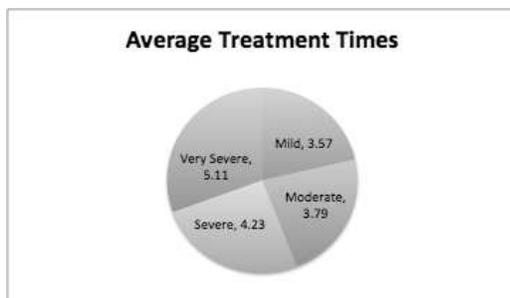


Figure 1. Differences in average treatment times among the four severity groups.

## DISCUSSION

The results of this study support the hypothesis that cranial remolding orthoses are effective treatment of NP. Furthermore, the data suggests that subjects that started treatment before nine months of age obtained significantly more correction than those that starting at nine months of age or later. This should transfer to clinical practice in the collaboration of insurance providers, the referring physician, and the orthotist to start treatment before nine months of age for the greatest correction. Data also suggest that more severe deformation requires longer treatment time to obtain a fully corrected head shape, and that severe cases obtained significantly more correction if treated longer than six months.

## CONCLUSION

This adds to the literature that supports treatment and weakens the few studies that have been used by insurance companies to deny coverage. Based on the positive treatment results in this study, insurance companies should cover CRO treatment as a low risk treatment option. Conductors of this study suggest a larger sample size for future studies. This would provide more power to statistical analysis and might provide more meaningful results.

## CLINICAL APPLICATIONS

The results of this study suggest starting treatment for NP as early as possible, but particularly before nine months of age, for maximal correction. It is also suggested that more severe cases be treated longer than six months, and that the presence of torticollis or prematurity does not negatively affect treatment outcomes.

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American Academy of Orthotists & Prosthetists  
**43rd Academy Annual Meeting &  
Scientific Symposium**  
March 1-4, 2017