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### CHANGES IN CRANIOFACIAL GROWTH AND DEVELOPMENT ASSOCIATED WITH NASAL CONTINUOUS POSITIVE AIRWAY PRESSURE (NCPAP) THERAPY IN PEDIATRIC PATIENTS

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**Aim:** The purpose of this project is to review the available evidence concerning changes in craniofacial growth associated with long term nCPAP therapy in pediatric patients. Pediatric patients with obstructive sleep apnea have several treatment options available including nasal continuous positive airway pressure (nCPAP). The nasal mask used to deliver positive airway pressure is secured to the paranasal area using elastic headgear straps, which are adjusted to obtain a tight seal of the mask to the face. The pressure exerted by the mask on the growing bones and soft tissues of the midface may be a potential cause of mid-face hypoplasia in growing children who are on long term CPAP or BiPAP therapy during their peak growth years.

**Methods:** A systematic review of the literature was conducted to examine the evidence concerning long term nCPAP use in pediatric patients and any associated changes in craniofacial growth and development. Electronic database searches of six databases were conducted, along with manual searches of retrieved abstracts and articles.

**Results:** Only one article was identified that met the selection criteria for the review. The article was a case report describing severe midface retrusion in 15-year old child associated with nCPAP therapy over a ten-year period.

**Conclusion:** There is insufficient evidence to determine the association between long term nCPAP use and changes in craniofacial growth and development in pediatric patients. The mechanisms, relative risks, and potential consequences of midface hypoplasia associated with long term nCPAP use in growing pediatric patients are discussed.

### LONG-TERM CHANGES USING A BONE-ANCHORED MAXILLARY EXPANDER (BAME) IN ADOLESCENTS – RANDOMIZED CONTROL TRIAL

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**Objective:** The purpose was to compare skeletal and dental long-term changes assessed by digital volumetric images produced after maxillary expansion between a bone-anchored expansion appliance and a conventional tooth borne RME.

**Methods:** A sample of 62 patients ranging between 11-16 years of age, all needing maxillary expansion were randomly allocated to either of three groups (traditional Hyrax tooth borne expander, bone-anchored expander and control). BAME consisted of two stainless steel onplants (8.0 mm x 3.0 mm), two miniscrews (12.0 mm length, 1.5 mm diameter), and an expansion screw. Records (CBCT) were taken at baseline and at 12 month follow-up. A repeated measure MANOVA was applied to the distances and angles measured to determine the statistical significance in time. Bonferroni post-hoc tests were used to identify specific significant differences between the treatment groups.

**Results:** Long term changes showed that none of the three groups presented statistically significant differences in symmetry angle. Both treatment groups had significant long-term expansion at the level of the upper first molar crown and root apex, upper first premolar crown and root, maxilla alveolus in the first molar and premolar regions and central incisor root. The tooth-borne expansion resulted in significantly more long-term expansion at the upper premolar crown and upper premolar root than the bone-borne expansion appliance.

**Conclusion:** Both expanders presented similar results. Greatest changes happened in the transverse dimension while changes in the vertical and antero-posterior dimension were negligible. Dental expansion was also greater than skeletal expansion.