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IMPROVING ORTHODONTIC CARE FOR SCHOOL AGED CHILDREN AND EARLY MANAGEMENT OF SKELETAL CRANIOFACIAL DISCREPANCIES

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Abstract. This narrative review examines timely orthodontic care for school aged children with skeletal craniofacial discrepancies. It distinguishes early detection from immediate appliance treatment and considers dental and skeletal outcomes separately. A proposed care pathway combines initial screening, specialist assessment, individualized timing and longitudinal follow-up. Early intervention should address a defined clinical problem, while routine two-phase treatment cannot be assumed to improve final outcomes in every child. The proposed service indicators require prospective validation; no original patient data are reported.

Keywords. pediatric orthodontics; school aged children; mixed dentition; skeletal discrepancies; early treatment; care pathways.

Introduction

The school-age period coincides with the transition from primary to permanent dentition and the continued growth of the facial skeleton. At this stage, outwardly similar malocclusions may stem from different underlying causes: tooth malposition, a discrepancy in jaw sizes, or a forced mandibular position during occlusion. Timely diagnosis makes it possible to determine whether immediate intervention is required or if monitoring—based on pre-established criteria for altering the treatment strategy—is sufficient [1].

Improving care involves addressing two distinct tasks. The first is identifying children who require an orthodontic consultation. The second is establishing the clinical indications for treatment following a specialized examination. Conflating these tasks can turn a preventive screening into grounds for prescribing an appliance without adequate diagnostic justification. For the family, this entails additional costs and a prolonged treatment burden; for the clinic, it complicates the assessment of the actual effectiveness of the care provided.

Objective

To establish clinical priorities for the early treatment of skeletal malocclusions in schoolchildren and to propose an organizational model linking pathology detection with an individualized treatment and monitoring plan.

Materials and Methods

This study was conducted as a narrative (non-systematic) review. We analyzed AAPD guidelines and selected publications regarding the treatment of Class II and III malocclusions, the use of functional appliances, and the detection of respiratory disorders [1–5]. Sources were selected based on their relevance to the timing of intervention, the nature of the therapeutic effect, and clinical care pathways; bibliographic details were verified via professional organization websites, publishers, and PubMed in September 2026. A full systematic review and meta-analysis were not performed.

In interpreting the data, a distinction was made between temporary occlusal correction, permanent skeletal changes, and the final outcome following subsequent treatment stages. The organizational

proposals represent an original model intended for future validation. Data regarding the specific patient sample, statistical calculations, and implementation results are not presented in this paper.

Analysis Results and Discussion

Diagnostic Basis for Early Intervention

A clinical conclusion must address the nature of the malocclusion. An isolated incisor crossbite and a Class III skeletal anomaly require different treatment approaches. Similarly, an increased sagittal overjet does not, in itself, indicate mandibular hypoplasia; the positions of both jaws and the inclination of the incisors must be assessed. Facial profile, symmetry, and the occlusal relationship are also important factors [1].

In the proposed initial examination chart, it is advisable to record chief complaints, the stage of dental eruption, the presence of crossbite, midline deviation upon closure, and mucosal trauma. Separate sections should be dedicated to the history of incisor trauma, oral habits, chewing difficulties, and the child's own attitude toward their appearance. Screening should not include a definitive diagnosis of skeletal pathology without appropriate diagnostic assessment.

For specialist consultations, it is recommended to formulate the primary problem in a single phrase—for example, "transverse maxillary deficiency with functional shift." This approach makes the subsequent decision verifiable: the prescribed intervention must target the identified problem. Radiographic examinations are selected based on the specific clinical question; repeated radiation exposure solely to demonstrate changes in the profile is not justified.

Timing Selection Based on Malocclusion Type

Data on Class II malocclusion demonstrate why an early interim effect cannot be equated to a superior final outcome. In a randomized study by Tulloch et al., differences observed after the first phase largely disappeared following comprehensive treatment of both groups during adolescence. The authors did not find the expected reduction in the complexity of subsequent treatment [2]. Consequently, the argument "if we start earlier, we will definitely finish better" is insufficient.

In our opinion, a decision to initiate early treatment for Class II malocclusion should be accompanied by a documented specific goal and a rationale for why delaying treatment is undesirable. Such reasons might include a significant risk of trauma to protruding incisors or a pronounced individual issue confirmed by clinical examination. In the absence of such circumstances, active monitoring should be considered a valid management strategy rather than a refusal of care.

For Class III malocclusion, it is essential to consider maxillary, mandibular, and functional components. A study by Willmann et al. compares skeletal and dental changes associated with two early treatment protocols using the Hybrid-Hyrax appliance [3]. The practical implication of this study is the need to evaluate correction mechanisms separately. Results achieved with a specific appliance cannot be generalized to every case of Class III malocclusion, nor can they guarantee that future surgical intervention will be unnecessary.

Modern studies on functional appliances also require careful interpretation. Hosseini et al. compared mandibular advancement using clear aligners versus the Herbst appliance, followed by comprehensive treatment. In both groups, correction involved changes to both jaw and tooth positions [4]. This supports the practice of separately recording skeletal and dentoalveolar components, rather than assuming the universal superiority of any single technology.

Organization of care at the school and clinical levels

A three-tier model is proposed. The primary tier identifies signs of malocclusion and provides the family with a clear referral. The orthodontist then clarifies the diagnosis and selects either a treatment plan or a monitoring approach. A follow-up stage assesses progress against the initial goal, patient tolerance, and the need for continued treatment. A designated specialist must be assigned to each tier, and the consultation outcome must be communicated back to the referring practitioner.

It is advisable for the referral to specify the observed clinical sign rather than a pre-selected appliance. For example, the phrasing "asymmetry upon closure; functional shift must be ruled out" is more informative than a recommendation to fabricate an appliance. The response report should specify the level of urgency, required examinations, the goal of the intervention, and the timeframe for a follow-up visit. This reduces the likelihood of losing the patient between the preventive screening and the specialist appointment.

The proposed system categorizes children into those requiring priority consultation, those for scheduled examination, and those requiring monitoring. Specific timeframes are determined by local resources and the clinical situation; these categories do not constitute an officially approved risk scale. Priority status should be based on functional issues, trauma, or progressive asymmetry, rather than solely on a subjective assessment of aesthetics.

Reports of habitual snoring, sleep-disordered breathing (apnea), and persistent mouth breathing require separate medical evaluation. AAPD policy views the dentist as a participant in risk identification and referral, rather than the sole specialist responsible for diagnosing obstructive sleep apnea [5]. In a school-based care pathway, this necessitates coordinating the orthodontic consultation with the pediatrician and ENT specialist when relevant symptoms are present.

Quality Control and Long-Term Outcome Assessment

Internal quality control measures should include the proportion of children who attend the consultation following referral; the time interval between detection and examination; the proportion of treatment plans with documented goals; the rate of unplanned treatment discontinuation; and the completeness of follow-up visits. These metrics describe the organization of care. They do not replace the assessment of occlusion, function, and tissue health, nor should they be interpreted as established criteria for treatment efficacy.

Clinical monitoring should be linked to the initial presenting problem. In cases of functional shift, the resolution of the shift is assessed; in cases of transverse deficiency, transverse relationships and the stability of the result are evaluated; In the case of sagittal correction, this involves a combination of profile, skeletal, and dental changes. It is essential to document treatment duration, patient discomfort, appliance breakage, and adherence to instructions; a favorable post-treatment photograph is no substitute for this information.

To scientifically validate the proposed model, it is advisable to compare consecutive patient groups from before and after its implementation, having established inclusion criteria and outcome measures in advance. Factors such as the severity of the initial malocclusion, the stage of growth, and family compliance must also be taken into account. Without such a comparison, a reduction in waiting lists or an increase in the number of consultations cannot be interpreted as evidence of improved clinical outcomes.

Limitations

This review does not cover the entire body of literature, nor does it allow for the ranking of appliances based on efficacy. The source studies vary in terms of participant age, study design, and follow-up duration. The proposed workflow requires validation within a specific organizational setting. Research findings from other populations cannot be automatically applied to estimate expected outcomes for schoolchildren in Uzbekistan.

Conclusions

Early detection of skeletal abnormalities must be distinguished from mandatory early treatment. Indications for treatment are determined by the nature of the anomaly, functional issues, the child's growth stage, and individual needs.

Improving care delivery should involve ensuring continuity between the initial examination and orthodontic follow-up. Each intervention requires a clearly defined objective and a method for verifying its achievement.

The proposed organizational model can serve as a basis for a prospective study. Its effectiveness should be assessed based on clinical outcomes and the completeness of follow-up, rather than the number of appliances fabricated.

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