# LIP INCOMPETENCE: CLINICAL APPLICATIONS

Treating children with lip incompetency raises several questions that should be asked and answered: **1)** Since the growth of the lips continues up to age 17, and since lip incompetency is usually replaced by a lips-together rest position around age 13 (Vig and Cohen, 1979), on what basis should therapy be offered, or declined, for those children under age 13, or even up to age 17? **2)** How can clinicians who provide lip exercises for children determine whether the gains achieved in lip length are related to the therapy provided or to spontaneous lip growth? and **3)** What morphological factors account for lip incompetence?

With regard to the first two questions, the clinical protocol for accepting individuals into therapy who have lip incompetence should involve a frank and detailed discussion with the child and parents about the growth patterns for the lips, as per the data of Vig and Cohen (1979). Also, the various morphological factors that can contribute to lip incompetence that may preclude success in therapy should also be explained, and revealed in the initial patient examination.

**Reasons to Treat Children**: One of the prevailing considerations in accepting a child referred for therapy with a complaint of lip incompetence relates to the social status of the child. If a child is being teased or is reported by parents to have some social problem due to an open-mouth rest posture that may include an interdental tongue rest position along with the lip incompetence, a clinician is more inclined to accept such a child into therapy in spite of the fact that the lip incompetence aspect of the oral issues may involve some spontaneous changes during the period of therapy. However, it seems unlikely that spontaneous lengthening of the lips would constitute a significant event that would negate the need for therapy. Since clinicians usually see lip incompetence in their practices that occurs in combination with other observations such as an interdental tongue position and the mandible being hinged open beyond the normal range, those accompanying oral rest variations serve to merit including such children in therapy who are at least age 6 years.

**Morphologic Factors Related to Lip incompetence**: There are several morphological factors that may accompany lip incompetency at all ages and that may preclude therapy success if not corrected prior to orofacial myofunctional therapy. Some of these contributing factors include: **1)** Protruded upper incisors that prohibit individuals from achieving lip competency. Normally, therapy cannot be successful with such patients until the protruded teeth are orthodontically retracted, although *it is possible that lip strengthening exercises may also result in retracting protruded upper incisors.* **2)** The dental condition of an anterior open bite can be severe enough to render the individual incapable of achieving lip competence due to the severe increase in the dental and skeletal anterior dimensions of the lower face. **3)** A lack of lip closure is often seen with the skeletal condition of *vertical maxillary excess* in which there is excessive, unwanted downward growth of the entire maxilla. If the posterior dentition is displaced downward more than the anterior dentition in this growth pattern, bite closure occurs in a manner in which the lower molars meet with the upper over-erupted molars sooner than normal, and an anterior, very “toothy” skeletal open bite is the result. This dental result from this unwanted vertical growth pattern creates a "gummy" smile related to over-eruption of all maxillary teeth – even though posterior dental eruption is greater.

There is a currently untapped role for the orofacial myofunctional clinician with such patients. After the maxilla has been surgically intruded in a patient with *vertical maxillary excess*, additional therapy by an orofacial myofunctional clinician may be needed. Exercises to strengthen the flaccid lip muscles that characterize such patients will serve to further normalize the relationship between the upper lip and the upper incisors.

Orofacial myofunctional clinicians can also play a role with patients under combined orthodontic or oral surgical care. In some instances before or after orthodontic treatment, or before or after oral surgical correction of orthognathic jaw deformities, therapy to exercise and strengthen flaccid lips will be needed. In some patients, differential treatment of both the upper and lower lip may be indicated. Since it is not always possible for an orthodontist or oral surgeon to set up the dentition to achieve a lips together relationship in repose, and with the lower lip normally covering 2-3 mm of upper incisors at rest (Vig and Cohen, (1979), some additional therapy protocols intended to exercise and lengthen the lower lip as opposed to the upper lip may be needed; that is, differential exercise for one lip to be lengthened more than the other.

Information regarding the ideal relationships of upper and lower lips and the anterior teeth and excess gingival display are considerations that orofacial myofunctional clinicians should note and address in the initial examination. Information revealed about the lips in the initial exam, and the plan for therapy exercises that will follow, will hopefully help clinicians to improve relationships with orthodontists and oral surgeons regarding the possibility of implementing exercises to lengthen and strengthen the lips. Many patients with jaw growth problems will exhibit flaccid lips that will need to be lengthened and strengthened.

**Eversion of the Lower Lip:** A lower lip with an excessive “roll” or eversion, and with flaccidity, is a common finding among children with a repaired unilateral or bilateral cleft lip. The reason for this is usually related to the difficulty in the initial lip surgery, at around 6 weeks of age, to join the parts of the separated orbicularis oris muscles across the upper lip area. The result of a lack of muscle integrity across the upper lip area becomes evident later on as an everted lower lip, with palpable flaccidity.

The situation with a lack of muscle unity across the upper lip area, with an everted lower lip, presents an opportunity for orofacial myofunctional clinicians. For children with repaired cleft lips who are facing additional revision surgery to achieve muscle union across the upper lip area, many surgeons, parents and patients may appreciate a period of therapy to attempt to reduce or eliminate an everted lower lip using resistance exercises. If therapy is successful, perhaps no further lip surgery will be needed. This scenario is another example of an untapped role for orofacial myofunctional clinicians with patients managed on a cleft lip and palate team.

**Why do lip exercises work: An anatomical explanation.** The musculature of the lips presents a unique anatomical situation for applying the myofunctional therapy techniques of muscle resistance. As is well known, resistance exercises result in the shortening and fattening of skeletal muscle fibers. Adding stretching exercises to the primary therapy protocol of exercises for the anterior oral sphincter should result in lengthening the upper lip area. How does this occur? The Button Pull exercise strengthens the muscle fibers of the orbicularis oris sphincter. Such stretching exercises provide vertical resistance against the horizontal fibers of the oral sphincter. The combined resistance within the oral sphincter itself, both horizontal and vertical, combines to achieve a lengthening result for the philtrum. The unique anatomy involved with the orbicularis oris anterior oral sphincter, in the absence of bony connections, involves the muscle fibers coursing horizontally across the upper and lower lip areas. The resulting shortening of muscle fibers within the sphincter then helps to elongate the upper lip as stretching exercises pull perpendicular to the horizontally-directed orbicularis oris musculature.

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