

# Importance of Lip Type Classification

## Maxillary Central Incisor Length Determination Versus Lip Phenotype



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Historically, dental students have been taught that the incisal edge of the maxillary central incisors should extend approximately 2.0 mm coronal to the upper lip, when the lip is in repose.<sup>1</sup> This statement is correct only if the patient has a horizontally straight lip in repose.

This article examines 3 different common lip phenotypes and the determination of appropriate maxillary central incisor incisal edge position.

### THREE LIP PHENOTYPES

There are 3 basic lip phenotypes in humans when the maxillary lip is in repose.<sup>2,3</sup> An example of each of the following 3 phenotypes is shown:

1. Straight lip (Figure 1).
2. Moderately arched lip (Figure 2).
3. Maximally arched lip (Figure 3).

### Basic Rules for Incisal-Plane Determination

A basic rule of maxillary incisal-plane determination is that there should be “some” tooth display when the upper lip is in repose.<sup>1</sup> Otherwise, it looks as if the person has no upper teeth, unless he or she is smiling. Only the lips-in-repose straight lip, however, can be used to help determine the ideal incisal edge position of maxillary central incisor teeth. If a patient has a moderately arched or maximally arched lip in repose, other guidelines must be used to determine the incisal edge position, because 50% to 100% of the maxillary incisor teeth may be displayed when the lips are in repose with these latter 2 phenotypes.

### Producing the Lips-in-Repose Position

The lips-in-repose position is produced by having patients lick their lips and the facial surfaces of their upper teeth, and then instructing them to part their lips. Another way to achieve this position is to instruct the patient to say “hi” with a relaxed upper lip without smiling. These 2 methods relax the upper lip, allowing it to fall passively.

### Restorative Tooth Position Versus Lip Position

As mentioned previously, there should almost always be some tooth display with a straight lip in repose.<sup>1</sup> In patients who present with no tooth display, restoring 2.0 mm of tooth display with lips in repose may feel unnatural, especially when enunciating an *f* or *v* sound. Those sounds are produced by placing the incisal edges of the maxillary anterior teeth in contact with the vermilion border of the lower lip.<sup>4</sup> In these cases, especially in older patients, it may be necessary to leave the patient in provisional restorations for a period of time to allow the patient to adjust to the increased length. Patient acceptance and accommodation of the increased incisor length almost always occurs, especially in women, because the new look is more youthful and attractive.

In cases of moderately or maximally arched lips, other general rules must be utilized to determine ideal position when maxillary incisor teeth are being restored:

1. When the patient is smiling, the maxillary central incisors should be perceived from a frontal view as the longest teeth in the incisal plane—longer than the lateral inci-

sors and cuspids.<sup>5</sup> Even though the cuspids are actually approximately the same length as the centrals when measured apicocoronally from the cemento-enamel junction (CEJ) to the incisal edge,<sup>6</sup> the centrals should appear longer because they should be at the apex of the *u*-shaped incisal plane arch (Figure 1b).

2. The average unworn maxillary central incisor is approximately 11 mm long, from the CEJ to the incisal edge.<sup>6</sup>

3. The maxillary incisal plane should parallel the *u* or quarter-moon shape of the lower lip.<sup>3</sup>

4. Dominant central incisors present a more youthful and sexy look.

If these markers are plugged into the incisal-plane formula, optimal maxillary incisal edge position can be determined, even without the aid of a straight lip in repose to assist. The optimal maxillary incisal plane should also parallel the gingival line, the upper lip, and the pupillary line.<sup>3</sup> Ideally, it should also be parallel to the mandibular incisal plane, but this is not essential to establish an attractive smile.

If the restored patient has an asymmetrical face, such that the left and right occlusal planes are also asymmetrical and not parallel to the pupillary line, always begin by paralleling the incisal edges of the restored maxillary central incisors with the pupillary line. The incisal plane should then extend proportionately distally to the lateral incisors and cuspids, and then to the occlusal plane of the posterior teeth, even if the right and left sides of those planes are not parallel to the pupillary line and are not exactly the same perceived length from a frontal view due to the patient's facial asymmetry.

Figures 4 to 6 show 3 restorative patients,



Figures 1a to 1c. (a) Straight lip in repose, (b) full smile, and (c) full-face smile.



Figures 2a to 2c. (a) Moderately arched lip in repose, (b) full smile, and (c) full-face smile.



Figures 3a to 3c. (a) Maximally arched lip in repose, (b) full smile, and (c) full-face smile.



**Figures 4a to 4f.** (a) Straight lip phenotype—before: in repose; (b) full smile; (c) full-face smile; (d) straight lip phenotype—after: in repose; (e) full smile; and (f) full-face smile.

each representing one of the 3 lip phenotypes. Views of before and after treatment are presented for each case with lips in repose, full smile, and full-face smile.

**Case 1:** Straight lip (Figure 4).

**Case 2:** Moderately arched lip (Figure 5).

**Case 3:** Maximally arched lip (Figure 6).

#### IN SUMMARY

Maxillary incisal-plane determination should be a definitive restorative procedure. One should consider the patient's lip phenotype, tooth length, and parallelism of the maxillary incisal plane, upper and lower lip lines, maxillary gingival line, and pupillary line. The maxillary central incisors should be perceived as the longest teeth in the incisal plane when observed from a frontal view. The 3 basic maxillary lip phenotypes are straight lip, moderately arched lip, and maximally arched lip. Only the lips-in-repose straight lip can be used to assist in determining the optimal maxillary central incisal edge length. ♦

#### References

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**Figures 5a to 5f.** (a) Moderately arched lip phenotype—before: in repose; (b) full smile; (c) full-face smile; (d) moderately arched lip phenotype—after: in repose; (e) full smile; and (f) full-face smile.



**Figures 6a to 6f.** (a) Maximally arched lip phenotype—before: in repose; (b) full smile; (c) full-face smile; (d) maximally arched lip phenotype—after: in repose; (e) full smile; and (f) full-face smile.