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Is beauty truly in the eye of the beholder? Evidence-based ideal smile esthetics

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ABSTRACT

A smile is a universal greeting and translates into all languages. Smiling individuals are judged as more pleasant and trustworthy, and the act of smiling actually releases endorphins that improve the mood of the person who smiles. As dentists, we are trained to create, maintain, and protect the ideal smile, but what should our goals be in achieving that "gold standard" of beauty?

The essential components of an ideal smile involve the relationship between three primary components: the teeth, the lip framework, and the gingival scaffold. While beauty may be in the eye of the beholder, factors that allow assessment of overall smile esthetics include tooth width/height ratio, shape, position, quality of restoration, and general arrangement of the dentition, especially of the anteriior teeth, upper lip position, buccal corridor, visibility of teeth, and amount of gingival display, These factors are considered in concert and usually judged esthetically as a group. It is considered that in the composition of a beautfiul smile, the form balance, symmetry, and relationship of these elements make it attractive or unattractive. This course seeks to present the current data regarding ideal smile components and the differences regarding ideal smile components based upon age, gender, and race/ethnicity to allow dentists to create personalized road maps and help their patients achieve vibrant smiles.

EDUCATIONAL OBJECTIVES

At the conclusion of this course, the reader should be able to:

1. List the components of a smile and discuss their roles in optimal smile esthetics
2. Describe the step-by-step approach to evaluating a patient's smile, including assessing tooth shape/shade, gingival display, and lip length/mobility
3. Understand the role of patient-based characteristics on acceptable esthetics and ideal smile components
4. Discuss personalized treatment options to achieve ideal smile esthetics based upon underlying diagnoses in each patient

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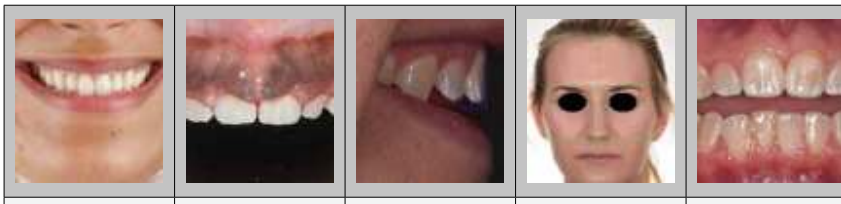
INTRODUCTION

Psychologists and scientists agree that the simple act of smiling can positively transform a person's life, as well as the lives of others. Hence, the smile can be considered one of the most fundamental factors to one's overall happiness and perceived beauty. The smile has become elevated to the forefront of the dental field with the increasing exposure by visual and entertainment media esthetic standards, decline in dental caries, and overall patient demand to improve their smiles. A study commissioned by the American Association of Orthodontists suggests that more than one third of US adults are unhappy with their smile esthetics.[1] This report also reviewed the social impact of decreased perceived esthetics, suggesting that 36% of those unhappy with their smiles believe they would have better social lives if they had better teeth.[1] Younger adults were particularly impacted; 48% of Americans ages 18–24 have untagged pictures of themselves on social media because they didn't like their smiles.[1]

A smile involves the relationship between the three primary components: teeth, lip framework, and the gingival scaffold.[2] While beauty may be in the eye of the beholder, certain characteristics of each of these components are associated with perceived esthetics by dental professionals and laypeople. These characteristics include: tooth width/height ratio; tooth shape and position; quality of restorations; occlusal scheme and crowding; upper lip position; buccal corridor; visibility of teeth; and amount of gingival display.[3-5] When assessing esthetics, dental health-care providers should consider such individual components in concert. Smiles are usually judged as a whole, and harmony of all components factor into the overall esthetics.[5,6] It is considered that in the composition of a beautiful smile, the form, balance, symmetry, and relationship of these elements make it attractive or unattractive. This course will assess the individual components that contribute to perceived smile esthetics and will also present the ways in which the interaction of those components in a dynamic smile work to create ideal esthetics.



Analysis of smile esthetics should assess concordance of lip contours with gingival and incisal positions, tooth shape, and midline position relative to the philtrum position.	Short tooth length can be attributed to gingival overgrowth, altered passive eruption, or microdontia. A comprehensive clinical and radiographic exam can identify causes.	Tooth inclination, tooth shade, midline asymmetry, and tooth width:length ratios are critical to overall assessment of an esthetic smile by laypersons and dental professionals.	Analysis of facial third symmetry is important in analysis of underlying rationale for excessive gingival display and facial symmetry. This can determine the need for multidisciplinary care.	Malocclusion, including midline symmetry, crowding, and anterior bit arrangement (open bite, overbite, overjet) contribute to unesthetic smiles and are treated with orthodontic therapy.

FIGURE 1: Common causes of compromised smile esthetics

WHAT MAKES A SMILE ESTHETIC? ORAL COMPONENTS OF AN IDEAL SMILE

Overall smile esthetics involve three oral tissues (teeth, lips, and gingivae) and their relationship with one another.[2] When assessing individuals who stated that they did not find their smiles ideally esthetic, complaints included all of the established components of a smile. Studies have demonstrated that tooth color was the most common smile component causing dissatisfaction among the subjects (27.9%), followed by tooth size (19.2%), tooth position (16.2%), tooth shape (15.0%), and lip shape (11.2%).[7]

Because of the broad range of complaints associated with compromised esthetics, an interdisciplinary approach to achieving ideal smile design allows for optimization of results. Employing an armamentarium of restorative techniques, orthodontic tooth movement, periodontal plastic surgery procedures, and facial esthetic procedures may be critical to address a combinatorial defect in smile esthetics. It is critical, therefore, that dental health-care professionals understand the individual components of a smile that are judged to be esthetic and mechanisms to maximize esthetics to improve their patients' smiles (figure 1).

TEETH

Shade

Color is usually described according to the Munsell color space in terms of hue, value, and chroma. Hue is the attribute of a color that enables the clinician to distinguish between different families of color, whereas value indicates the lightness of a color. Chroma is the degree of color saturation. In dentistry, the hue is characterized by a letter "A" through "D." The average shade for an untreated tooth is A3 and the lightest naturally occurring shade is generally considered to be B1.[8] Tooth shade generally darkens as patients age[9,10] and women are more likely to present with teeth of a lighter shade than men.[10] It is generally accepted that patients prefer a lighter tooth shade, but this may be influenced by skin and lip color, age, and gender.[11,12] Furthermore, other components of light reflection—such as translucency, fluorescence, and opalescence—may also influence the perceived esthetics.

Tooth size

Both tooth width:length and the width-to-length ratio of teeth are critical to achieving smile esthetics. The average vertical height of maxillary central incisors is 10.6 mm in males and 9.8 mm in females.[13,14] Short clinical tooth crowns may be due to fracture, attrition, altered passive eruption, or gingival overgrowth. Extended clinical crowns may be due to gingival recession or improperly designed dental restorations. Similarly, the width:length ratio of teeth is critical for perceived esthetics, with the mean width:length ratio being 78% and a range of 75%–80% judged as esthetically acceptable.[15]

Anterior tooth inclination

Proclined maxillary incisors tend to reduce the incisor display, whereas uprighted or retroclined maxillary incisors generally increase the incisor display. Therefore, tooth inclination may contribute to inadequate or excessive tooth display.[16]

Occlusal plane orientation

The cant of the occlusal plane can affect the relationship between the maxillary teeth and the lower lip both at rest and during smile display.[16] For example, a cant of the maxillary occlusal plane directed upward and anteriorly will result in maxillary incisal edges that do not follow the curvature of the lower lip, reducing esthetics in a smile.

Dental midline

The dental midline is an important focal point in an esthetic smile.[17] Generally, a dental midline that corresponds with the facial midline—a line from the nasion to the base of the philtrum, or "cupid's bow"—is deemed most esthetic, although significant deviation must be present for a smile to be judged as unattractive by dentists and laypeople.[18] Therefore, mild midline discrepancies may be acceptable in cases with other esthetic smile components and a vertically oriented interproximal contact between the maxillary central incisors.[18]

Buccal corridor/transverse arch dimension

The buccal corridor is generally considered to be the negative or empty space between the buccal surfaces of the posterior teeth and the commissures of the mouth when smiling.[19,20] The esthetic value of this space is equivocal with some data suggesting that dentures that completely fill the space are considered less esthetic and less natural in appearance and other literature suggesting that postorthodontic therapy that fills this space and results in a first molar to first molar smile is optimal.[20-22] A lack of buccal corridor fill also has not been determined to be detectable by laypersons as influencing esthetics.[22] Transverse arch dimension affects the buccal corridor fill; a broad arch is more likely to fill the buccal corridors than a narrow and constricted arch. Buccal corridor fill may also be influenced by the relative anteroposterior position of the maxilla in relation to the frame of the lips.[16,19]

LIPS

Lip length

Lip length is generally measured in repose from the subnasale to the most inferior visible portion of the upper lip at the midline. Mean lip length is 23 mm in males and 20 mm in females and has been shown to increase with age.[11]

Lip length also should be approximately equal in length with commissure height, i.e., the vertical distance between the commissures and a horizontal line from the subnasale point. During a full smile, the commissures of the mouth move outward and upward, and this creates the arched lip form considered esthetic. A short upper lip can result in lip incompetence, excessive gingival display, and/or a reverse resting upper lip line.[23]

Lip mobility

In a full smile, the upper lip elevates to display the anterior teeth. On average, this lip mobility accounts for 80% of the original lip length, and maxillary incisal display at full smile is approximately 10 mm.[22] While there is considerable interindividual variation in lip mobility, with a physiologic range of 2–12 mm,[24] women tend to have more mobility than men.[22] Excessive lip mobility could result in excessive gingival display at full smile in cases with normal lip length.

Lip curvature

Lip curvature is characterized by the position of the upper lip at the midline relative to the position of the commissure in full smile. It may be upward, straight, or downward.[21,25,26] Both laypersons and dentists judge upward and straight lip curvatures to be more esthetic than downward lip curvatures.[21] Because lip curvature is determined by facial musculature, dental treatment alone may be limited in treating an individual with a downward lip in order to achieve an optimal smile.

Lip volume

Voluminous lips—generally resulting in greater maxillary incisor exposure at smiling, at rest, or while speaking—are considered critical to a current standard of esthetics.[27] Lip volume is influenced by anteroposterior positioning of teeth as well as anatomical variations in lip size.[28] Lip volume has been shown to decrease with age.[28] It is also important to note that the relative volume of the lower lip is generally greater than the upper lip, but upper lip augmentation procedures with surgical interventions and soft tissue fillers increased 60% and 312%, respectively, between 2000 and 2017.[29]

GINGIVAL SCAFFOLD

Gingival color/texture

Inflammation, leading to gingival edema, can cause alterations in color, texture, and contour of the gingiva.[30] Healthy gingiva is generally considered to be coral pink in color and may have a stippled (or "tufted") appearance. Gingival erythema and/or rolled gingival margins can be perceived as unesthetic.[31]

Papillary fill

Gingival tissues in the interdental areas, papillae, are considered most esthetic when they just fill the interdental space. Papillary overfill, as in the case of significant gingival inflammation, and missing or blunted gingival papillae are both considered unesthetic.[31] Incomplete papillary fill, i.e., a "black triangle," can be caused by interproximal bone loss, triangular tooth form, root divergence, open dental contacts, or as a result of resective periodontal surgery. If the distance from the interdental contact point to the crest of the interproximal bone is 5 mm, papillae are present 100% of the time, but the prevalence of papillae when the distance between the contact point and the interproximal crest is 6 mm is only 56%.[32]

Gingival contours

The height of the gingival margins of anterior teeth and their relationship to one another is a component of esthetics. The height of gingival contour of the central incisors generally corresponds to those of the canines with the gingival margins of the

lateral incisors approximately 1–1.5 mm more coronal than those of the canines/central incisors. Discrepancies in these gingival margins may be caused by incisal attrition, ankylosis, altered passive eruption, dental malocclusion, or gingival recession.[33-35]

Gingival display

Upper lip position at full smile that is concordant with the gingival zeniths of the central incisors results in no gingival display.[26,36,37] Excessive gingival display, sometimes called a "gummy smile," may be categorized into one of five classes, ranging from class 1, where the lip is positioned well above the cervical portion of the maxillary teeth, to class 5, where the lip is positioned to provide full coverage of the maxillary teeth. While the ideal amount of gingival display is not uniform among populations, some investigators have shown that ideal lip position occurs when the lower margin of the upper lip aligns evenly with the gingival margin of the maxillary central incisiors.[26,36,37] However, other studies have demonstrated a combination of maxillary incisor visibility and gingival display up to 1 mm is judged equally or more attractive.[38,39] The amount of gingival display considered acceptable may vary based upon subject age and gender and the societal norms within individual communities.[18,40] Excessive gingival display is determined to be more detrimental to esthetics in men when compared to women.[18,40] For instance, studies in some communities show that patients with gingival display in excess of 3 mm can be considered to have acceptable esthetics.[18,40]

SMILE COMPONENT INTERACTION AND SYMMETRY

Overall facial attractiveness is driven by many factors, including the interaction of the individual component of smile esthetics, symmetry, and cultural/gender influences on perception.[41,42] Facial attractiveness, including smile esthetics, drives the quality of dating partners, and attractive individuals are perceived to be more intelligent and nicer.[43-46] However, quantification of facial attractiveness and smile esthetics as well as calibration of a single standard for esthetics has proved elusive. Standards for these ideals also diverge between professionals and laypersons.[47] Overall, higher levels of facial and smile symmetry and meeting associated gender norms have been correlated to increased levels of attractiveness.[48,49]

Smile symmetry

Smile symmetry, including the symmetry of individual smile components, e.g., tooth size and gingival contours, and the dynamic movement of the lips during smiling are key components of smile esthetics.[50] The presence of a unilateral lateral incisor width change of >1 mm was considered unesthetic by both dentists and laypersons, but bilaterial changes of the same amount were not judged as harshly.[51] Furthermore, large left-to-right differences in the relative positioning of the corners of the mouth in the vertical plane at full smile, such as is seen in patients with muscular tone impairment, has a significant negative impact on smile esthetics.[52,53] Additionally, in these cases, an oblique commissural line, i.e., one that is off-parallel with the interpupillary line, may give the illusion of skeletal asymmetry and/or a transverse cant of the maxilla and negatively affect esthetics.[16]

Smile arc

Overall, the alignment of the maxillary incisal edges with the inner contour of the lower lip at full smile is considered to be ideal and is often described as "consonant."[54] The curvature of the incisal edges and lip curvature tend to be more pronounced in younger smiles and flatten with age,[55] leading to the perceived desirability of such a relationship for optimal esthetics. Smile arcs were found to be flatter in orthodontically treated patients than in an untreated group with normal occlusions, which may inadvertently compromise overall esthetics.[17,26,56]

ASSESSING SMILE ESTHETICS: CLINICAL AND PHOTOGRAPHIC EXAMINATION

When treating a patient for esthetic concerns, it is vital for the dental practitioner to understand what defines an esthetic smile. Is it truly in the eye of the beholder, the dental health-care professional's perception, or a combination of the two? In order to critically assess the individual smile components and their interaction, careful examination and documentation are necessary in both static and dynamic function. Full facial photographs at rest and full smile in a 1:1 image ratio can allow for measurements of dental midline alignment, lip length, lip mobility, gingival display, buccal corridor fill, smile cant, and consonant/nonconsonant smile arc. Intraoral measurements of incisor length, width:length ratios, gingival recession and/or overgrowth, and papillary fill should also be recorded during a comprehensive intraoral examination. Lastly, utilization of videography to assess dynamic components of smile esthetics may be helpful in patients with high esthetic concerns.

Emerging technologies, including machine learning and three-dimensional stereophotogrammetry, have been suggested to improve assessments and eliminate perception bias and manipulation.[57-59] Currently, these technologies may not be reliable enough to fully assess facial attractiveness and smile esthetics. In their current form, they may also be very time consuming and technique sensitive, but they have been incorporated into research and may prove to be valuable tools as their use increases to include larger populations.

SMILES FROM MONA LISA TO JULIA ROBERTS: WHAT INFLUENCES VARYING STANDARDS OF SMILE ESTHETICS?

While we often consider certain characteristics to be universally appealing, facial attractiveness and smile esthetics are influenced by the individuals judging the ultimate result. It is well established that dental health-care professionals and plastic surgeons have a higher standard for facial esthetics than laypersons with similar demographics and socioeconomic status.[60,61] Furthermore, age, gender, geographic divergence, and cultural norms may impact perception of smile esthetics, with men and older individuals being more tolerant of certain deviations from esthetic standards.[62-67] For patients, their individual standards and self-perception affect their

FIGURE 2: Excessive gingival display ("gummy smile") causes and interventions: esthetic crown lengthening and lip repositioning surgeries to address altered passive eruption and hypermobile upper lip, respectively.

preferences with regard to the importance of smile esthetics more so than the opinions of their dental health-care providers.[62] Lastly, esthetic ideals are not static and changing parameters of ideal smile esthetics can be influenced by mass media, including TV, films, magazine, fashion, ads, and social media.[68,69]

Given the myriad influences on perception of attractiveness and the relative importance of patients' self-evaluation of their smile esthetics, it is important to thoroughly probe patients' chief complaints when they present with esthetic concerns. The esoteric nature of "ideal" attractiveness also increases the importance of initial trials with reversible interventions, including digital modeling, to assess patient satisfaction with likely outcomes of therapy and to manage patient expectations for predictable results.

SMILES BY DESIGN: INTERVENTIONS TO ACHIEVE OPTIMAL SMILE ESTHETICS

Generally, an optimal smile is characterized by an upper lip that reaches the gingival margins, with an upward or straight curvature between the philtrum and commissures; an upper incisal line coincident with the border of the lower lip; minimal or no lateral negative space; a commissural line and occlusal frontal plane parallel to the pupillary line; and harmoniously integrated dental and gingival components. However, without intervention, it is infrequent that patients present with all of these components in place. Comprehensive assessment of the deviations from "ideal" and a robust understanding of patient needs and desires allow for development of a targeted, interdisciplinary treatment plan to address patient needs. Patient complaints that are limited to tooth shape and/or shade only can generally be addressed with restorative therapies. Other patient complaints may require further investigation. For example, short clinical tooth crowns may be associated with wear or altered passive eruption. Determination of ideal therapy requires an assessment of incisal display and lip position at rest and in full smile.[2,70] In cases of little to no incisor display at rest with a normal lip line during full smile, this can be attributed to limited crown height incisally, and the crowns may be extended using restorative techniques. Conversely, if short clinical crowns are associated with excessive gingival display and normal incisor display at rest, the patient will likely require resective surgical intervention to perform a gingivectomy or a crown-lengthening procedure, depending upon the classification of altered passive eruption. We will review two common patient esthetic complaints and potential interventions below.

Excessive gingival display/"gummy smile"

Excessive gingival display may be due to one or more of the following factors: 1) gingival overgrowth, 2) altered passive eruption, 3) vertical maxillary excess (VME), 4) short upper lip, 5) hypermobile upper lip, and 6) dentoalveolar extrusion.[70] Clinical examination to determine clinical crown height, lip length and mobility, and vertical facial-third symmetry should allow for identification of the underlying etiology for the gingival display (figure 2).[71,72] In cases of gingival overgrowth and altered passive eruption, patients will present with short clinical crowns and either excessive gingival tissues or excessive gingiva and alveolar bone, respectively.[2] Patients with altered passive eruption demonstrate periodontal attachment apparatus at a position that is more coronal than anatomic norms. These patients should be treated with resective surgical intervention and an evaluation of potential underlying systemic conditions or medications that may contribute to gingival overgrowth.[73] Both VME and a short upper lip may present with lip incompetence, but lip length will be normal in cases of VME.[2] VME is associated with a lengthening of the lower facial third. VME may be addressed with orthognathic surgery, and a short upper lip would require lip lengthening surgery to reduce gingival display.[72] Lip hypermobility is present in cases of normal lip length with increased mobility. Addressing this may require lip repositioning surgery and/or, in some cases, treatment with botulinum toxin to reduce muscle hyperfunction.[72-74] Dentoalveolar extrusion occurs due to overeruption of maxillary incisors and may present with increased clinical crown length, potential lip incompetence, and alteration of arch curvature.[72] Treatment should include orthodontic intrusion of the supererupted incisors. In some cases, patients may present with concomitant underlying etiologies for excessive gingival display and coordinated interdisciplinary care may be necessary.[72]

Smile asymmetry

Symmetry has been associated with increased perceived facial attractiveness.[75,76] Patient histories and complaints regarding symmetry should be carefully reviewed to determine patients' concern and the rationale for proposed therapy (figure 3). Asymmetry associated with tooth shape may be addressed restoratively or may require orthodontic tooth movement to establish space to allow for ideal restorative care. Asymmetry associated with midline, smile arch, or smile cant may require treatment with orthodontic and/or orthognathic means.[77] Gingival contour

FIGURE 3: Assessment of symmetry of the teeth related to the facial midline as well as ideal tooth proportions can indicate a need for interdisciplinary care.

asymmetry may be due to gingival recession or gingival overgrowth. Complete documentation of examination findings and thorough assessment of gingival margin relationship with the cementoenamel junction is critical to appropriate diagnosis.[78] Root coverage periodontal plastic surgery procedures, either alone or in combination with restorative therapies, can be used to reestablish appropriate gingival contours.[77] Lip asymmetry may be associated with volume and/or mobility. Asymmetry associated with lip volume may be addressed with dermal fillers,[79,80] and myofascial exercises may be helpful to strengthen weakened muscles leading to asymmetrical lip movement.[81]

CONCLUSION

Understanding the complex interactions of the components of smile esthetics and the potential interventions that can be provided by dental health-care professionals leads to optimal outcomes. Care must be patient-centered to address individual patients' perceived esthetic challenges. Demonstration of likely treatment outcomes using digital modeling and/or reversible procedures may allow patients and practitioners to have a robust discussion about predictable and achievable outcomes of treatment. It is also important to consider interdisciplinary treatment modalities that provide solutions to address overlapping etiologies that contribute to compromised smile esthetics.

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QUESTIONS

1. A study commissioned by the American Association of Orthodontists suggests that at least ___ US adults are unhappy with their smile esthetics.

A. 1:2
B. 1:3
C. 1:5
D. 1:10

2. Approximately ___ of US adults ages 18-24 report that they have untagged pictures of themselves on social media because they didn't like their smiles.

A. 24%
B. 36%
C. 48%
D. 56%

3. The anatomical features of an esthetic smile include all of the following except:

A. Teeth
B. Lips
C. Gingivae
D. Tongue

4. In individuals who were unsatisfied with their smile esthetics, the most common complaint was:

A. Tooth size
B. Tooth position
C. Tooth color
D. Lip shape

5. The average vertical height of maxillary central incisors is ___ in males and females, respectively.

A. 10.6 mm and 9.8 mm
B. 11.2 mm and 10.6 mm
C. 9.8 mm and 8.7 mm
D. 12.3 mm and 11.2 mm

6. The ideal width-to-length ratio for teeth is considered to be the "golden proportion." The mean width-to-length ratio for teeth in adults in a range of ___ is judged as esthetically acceptable.

A. 80%-85%
B. 75%-80%
C. 70%-75%
D. 65%-70%

7. A. The dental midline at the maxillary central incisors that corresponds to the facial midline (a line from the nasion to the base of the philtrum, or "cupid's bow") is deemed most esthetic.
B. Mild midline discrepancies in cases with other esthetic smile components and a vertically oriented interproximal contact between the maxillary central incisors are judged unacceptable by dentists and laypeople.

A. Both statements are true.
B. The first statement is true; the second statement is false.
C. The first statement is false; the second statement is true.
D. Both statements are false.

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QUESTIONS

8. A. Lack of buccal corridor fill has been determined to be detectable by laypersons as a drive of esthetics. B. Buccal corridor fill may also be influenced by the relative antero-posterior position of the maxilla in relation to the frame of the lips.

A. Both statements are true.
B. The first statement is true; the second statement is false.
C. The first statement is false; the second statement is true.
D. Both statements are false.

9. Lip length is measured in repose from ___ at the midline and should be approximately equal in length with commissure height.

A. The nasion to the most inferior portion of the upper lip
B. The subnasale point to the philtrum
C. The nasion to the philtrum
D. The subnasale point to the most inferior portion of the upper lip

10. On average, lip length is ___ in males and females, respectively, and has been shown to increase with age.

A. 18 mm and 16 mm
B. 20 mm and 18 mm
C. 23 mm and 20 mm
D. 25 mm and 23 mm

11. In most patients, lip mobility accounts for approximately ___ of the original lip length.

A. 60%
B. 70%
C. 80%
D. 90%

12. While an average 10 mm of maxillary incisal display is present at full smile, the interindividual variation includes a physiologic range from ___.

A. 5-15 mm
B. 2-12 mm
C. 4-10 mm
D. 3-14 mm

13. Papillary fill can be predicted by the relationship of interproximal bone levels to the apical extent of the interdental contact point. If the distance from the interdental contact point to the crest of the interproximal bone is £5 mm, papillae are present 100% of the time, but the prevalence of papillae when the distance between the contact point and the interproximal crest is 6 mm is ___.

A. 72%
B. 64%
C. 56%
D. 47%

14. The height of gingival contour of the central incisors generally corresponds to that of the canines with the gingival margins of the lateral incisors approximately ___ more coronal than those of the canines/central incisors.

A. 3.5-4 mm
B. 2.5-3 mm
C. 2-2.5 mm
D. 1-1.5 mm

15. A. While the ideal amount of gingival display is not uniform among populations, some investigators have shown that ideal lip position occurs when the lower margin of the upper lip aligns evenly with the gingival margin of the maxillary central incisors. B. Gingival display is judged to be more detrimental to esthetics in men when compared to women.

A. Both statements are true.
B. The first statement is true; the second statement is false.
C. The first statement is false; the second statement is true.
D. Both statements are false.

16. All of the following are associated with facial attractiveness, except:

A. Quality of dating partners
B. Self-reported health outcomes
C. Perceived intelligence
D. Perceived pleasantness

17. The presence of a unilateral lateral incisor width change of > ___ is considered unesthetic by both dentists and laypersons.

A. 2.5 mm
B. 1.5 mm
C. 1 mm
D. 0.5 mm

18. A consonant smile arc is defined as:

A. Alignment of the maxillary incisal edges with the inner contour of the lower lip at full smile
B. Alignment of the maxillary incisal edges 2 mm above the lower lip contour
C. A smile with completely filled buccal corridor space
D. Alignment of gingival zeniths with the inferior border of the upper lip at full smile

19. Incisal edge and lip curvature tend to be more pronounced in:

A. Younger patients
B. Patients who were treated with orthodontic therapy
C. Older individuals
D. A and B

20. In order to critically assess the individual smile components and their interaction, careful examination and documentation are necessary in both _____ and ____ function.

A. Rest and masticatory
B. Static and dynamic
C. Masticatory and phonetic
D. Phonetic and static

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QUESTIONS

21. A. Age, gender, geographic divergence, and cultural norms may impact perception of smile esthetics. B. Women and younger individuals are more tolerant of certain deviations from esthetic standards.

A. Both statements are true.
B. The first statement is true; the second statement is false.
C. The first statement is false; the second statement is true.
D. Both statements are false.

22. Dental health-care professionals and plastic surgeons have a ___ standard for facial esthetics than laypersons with similar demographics and socioeconomic status.

A. Lower
B. Higher
C. Similar
D. More complex

23. Patients' individual standards and self-perception are ___ to their smile esthetics when compared to the opinions of their dental health-care providers.

A. Equally as important
B. Less important
C. More important
D. Irrelevant

24. A. Over time, esthetic ideals are mutable and may be influenced by mass media, including TV, films, magazines, fashion, advertisements, and social media. B. The esoteric nature of "ideal" attractiveness also increases the importance of initial trials with reversible interventions, including digital modeling, to assess individual patient satisfaction with likely outcomes of therapy and to manage patient expectations for predictable results.

A. Both statements are true.
B. The first statement is true; the second statement is false.
C. The first statement is false; the second statement is true.
D. Both statements are false.

25. Which of the following are potential etiologies associated with excessive gingival display ("gummy smile")?

A. Altered passive eruption
B. Vertical maxillary excess (VME)
C. Short upper lip
D. All of the above

26. Altered passive eruption is characterized by excessive gingival display, short clinical crowns, and ___ position of the periodontal attachment apparatus.

A. Apical
B. Buccal
C. Coronal
D. Posterior

27. Lip incompetence at repose is noted in all of the following conditions except:

A. Vertical maxillary excess (VME)
B. Gingival overgrowth
C. Short maxillary lip
D. Dentoalveolar extrusion

28. Vertical maxillary excess is associated with which of the following findings?

A. Normal maxillary lip length
B. Elongated lower facial third
C. Lip incompetence at repose
D. All of the above

29. Gingival contour asymmetry due to gingival recession can be identified through careful assessment of gingival margin relationship with the cementoenamel junction. Root coverage periodontal plastic surgery procedures, either alone or in combination with restorative therapies, can be used to reestablish appropriate gingival contours.

A. Both statements are true.
B. The first statement is true; the second statement is false.
C. The first statement is false; the second statement is true.
D. Both statements are false.

30. Demonstration of likely treatment outcomes for patients using ___ can allow patients and practitioners to have a robust discussion about predictable and achievable outcomes of treatment and may direct practitioners to more ideal therapies for individual patients.

A. Reversible procedures
B. Digital modeling
C. Interdisciplinary therapy
D. All of the above

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ANSWER SHEET

Is beauty truly in the eye of the beholder? Evidence-based ideal smile esthetics

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EDUCATIONAL OBJECTIVES

1. List the components of a smile and discuss their roles in optimal smile esthetics
2. Describe the step-by-step approach to evaluating a patient's smile, including assessing tooth shape/shade, gingival display, and lip length/mobility
3. Understand the role of patient-based characteristics on acceptable esthetics and ideal smile components
4. Discuss personalized treatment options to achieve ideal smile esthetics based upon underlying diagnoses in each patient

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5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	20.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	21.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	22.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	23.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	24.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	25.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
11.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	26.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
12.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	27.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
13.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	28.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
14.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	29.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
15.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	30.	Ⓐ	Ⓑ	Ⓒ	Ⓓ

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