

Chapter 6 . Treatment Planning: Facial Aesthetics

THE INTERVIEW

- The preoperative, and often repeat, consultation is critical to the success of rhinoplasty surgery. Numerous important points need to be addressed by the surgeon in consultation. A patient's motivation for surgery is of utmost importance. What is the reason the patient is interested in surgery? Is the patient undergoing the procedure for self image or in response to external pressures? It is important that the patient is internally motivated to undergo rhinoplasty surgery, with its inherent risks and complications, and is not feeling pressure from another person. It is also important that the patient is not doing it to regain a lost romance or be rehired to a lost job.
- Historically, authors and artists have depicted the "normal" face in various ways. With regards to the nose, its structure has been described in both absolute and relative lengths, widths, and angles. In reality, there is no true normal nose but values and relationships exist that are considered normal for most persons. Rather than subjecting each prospective patient to a plethora of measurements, the surgeon should be familiar with the important ones and decide which are most useful. After facial analysis, any deviations from normal should be discussed with the patient to discuss the patient's level of motivation for treatment. In almost all cases, the patient's desires should take precedence over the surgeon's effort to meet established "norms" in rhinoplasty surgery. Rhinoplasty requires an aesthetic eye as well as a sharp pencil.¹
- The surgeon should identify functional problems as well as aesthetic concerns and prioritize these in a problem list. It is important to educate the patient about any factors that may make a result fall short of the planned goals and set realistic expectations for surgery.
- It is important to question the patient about any functional problems when planning the operative steps.
 - Is there a history of difficulty breathing?
 - If so, is this seasonal or sporadic?
 - What medications does the patient take and how frequently?
- Several maneuvers performed in rhinoplasty can actually lead to airway obstruction. In these cases, counteractive procedures need to be incorporated into the treatment plan and the patient needs to be counseled about the possibility of new or persistent airway obstruction. In situations where aesthetic goals (ie, narrowing of the nose) may be limited due to functional concerns, it is preferable to err on the side of function rather than create airway problems while attempting to achieve aesthetic goals.
- In order to successfully meet the patient's goals, it is important that the patient clearly communicate the desired changes that are to be achieved. Occasionally, a patient will offer a broad concern such as "I just don't like my nose." In this case, the surgeon may be able to identify aspects of the nose that deviate from the aesthetic norm. When these features are tactfully presented to the patient, there is frequently immediate agreement and a clarification of treatment objectives. The surgeon should feel that he is not leading the patient. To some extent, the result depends on the anatomy and physiology with which the patient presents. It is important that the patient realizes the limitations to what can be achieved in given individuals.
- Similarly, the surgeon must be able to identify the areas of concern. One of the most crucial aspects of the rhinoplasty consultation is to make certain that the surgeon understands the patient's goals and that these goals are realistic. Computer imaging is a useful tool to help determine patient goals and will be discussed in this chapter. The surgeon must also honestly assess his ability to achieve the result. It is wise to be conservative in rhinoplasty surgery at the beginning of one's career. This may mean referring a difficult case to a more experienced surgeon or staying within one's comfort zone to avoid doing irreparable harm. It is better to return for a minor revision than create the need for a major revision.

THE EXAMINATION

- The six standard preoperative rhinoplasty views are frontal (Figure 6-1), oblique (Figures 6-2 and 6-4), and lateral (Figures 6-3 and 6-5) as well as worm's eye (Figure 6-6).

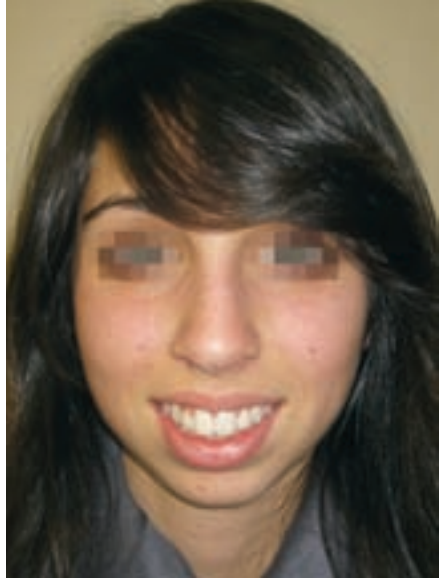


Figure 6-1



Figure 6-2



Figure 6-3



Figure 6-4



Figure 6-5

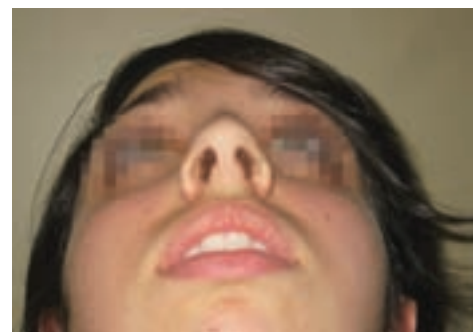


Figure 6-6

- Numerous findings on a patient’s physical exam may pose limitations to the expected outcome irrespective of the skill of the surgeon. Despite the artistry with which the supportive bone and cartilage are manipulated, the ultimate aesthetic outcome of the nose is based on how the overlying skin drapes over the supporting framework. Thick and thin skin can both predispose to sub-optimal outcomes. Thick skin draped over even the most well-crafted bone and cartilage will hide the detail in these supporting structures. In contrast, thin skin is unforgiving in that all imperfections can be visible. Suture knots, as well as minor irregularities, can become alarmingly apparent requiring revision surgery.
- **Frontal view:** From the patient’s frontal view, several important landmarks and relationships should be identified.
 - *Facial dimensions:* The face may be divided into various parts as a means of evaluating areas of imbalance. Vertically, the distance from a horizontal line across the hairline to a line across the eyebrows defines the upper third of the face. The middle facial third is the distance from a line between the eyebrows to the subnasale and the lower facial third from the subnasale to the bottom of the chin. Although these have traditionally been defined as facial thirds, the lower third is slightly larger than the middle third, and the middle third is slightly longer than the upper third.^{2,3} Horizontally, equal fifths can be created by lines running vertically through the lateral and medial canthi of each eye.
 - *Alar width:* The width of the nose at the alar base should approximate the span between the medial canthi (Figure 6-7). Wide alar bases may require skin and/or soft tissue excision.
 - *Nasal width:* The width of the nose at the level of the nasal bones as well as the alar base should be evaluated. In general, the width of the nasal bones at their base should be four-fifths of the width of the alar base. Wide nasal bones may require osteotomy and infraction.
 - *Dorsal aesthetic lines:* As important as any component of the nasal evaluation, the surgeon must note the appearance of the dorsal aesthetic lines (Figure 6-8). By definition, they originate on the supraorbital ridges near the medial end of the eyebrow and begin to converge along the glabellar area. They are narrowest at the level of the medial canthal ligaments and then diverge gradually to end at the tip-defining points.
 - *Nasal tip:* The appearance of the tip should be evaluated in isolation and as it relates to the nasal dorsum. The tip-defining points are an important landmark in tip analysis and occur at the transition point between the medial and lateral crura of the lower lateral cartilages. In photographs, the tip-defining points are

identified as two bright spots that reflect an external light source. Tip projection, position and the distance between the highlights, the angle of divergence between the crura, and the length of the middle and lateral crura should also be evaluated. The thickness of the nasal skin and the strength of each section of alar cartilage are assessed by visualization and palpation. Tip projection and rotation are best evaluated on the lateral view. The nasal tip is perhaps the most defining feature of a nose. In one random series, the tip-defining points were 8.9 +/- 1.6 mm separate from each other.⁴ The course of the lateral crura of the lower lateral cartilages should be noted. In some patients, the lateral crura diverge from the rim at an angle greater than the normal 30 to 45 degrees. This anatomic variation produces a round tip often described as a “parentheses” deformity on frontal view.⁵ Aside from the aesthetic implications, the malposition of the lateral crura places them at risk for injury when making a standard intracartilaginous incision.⁶ The “boxy tip” is due to an increased angle of divergence between the genu of the lower lateral cartilages (more than 30 degrees), a widened domal arc (more than 4 mm), or a combination of the two.⁷

- Hyperactivity of the *depressor septi nasi* muscle has been noted to contribute to drooping of the nasal tip. This may be diagnosed preoperatively by observing the patient at rest and then when smiling. Muscle contraction will worsen the deformity and provide an indication to address this paired muscle at surgery.⁸
- *Nasal deviation:* The degree of nasal deviation must be assessed in every rhinoplasty patient. Several points can be used to denote nasal midline: mid-glabella, mid-dorsum, nasal tip, central cupid’s bow depression, maxillary dental midline, and chin midline. In almost every patient, these points are not on a straight, vertical line. It is imperative to inform the patient of these deviations preoperatively. This is especially important in the patient with subtle facial asymmetry who complains of a deviated nose but is unaware of their underlying facial asymmetry. These patients will complain of nasal deviation yet when the lower half of the nose is covered and the upper half of the nose is related to the upper facial midline marks, it looks on the midline. However, when the upper half of the nose is concealed, and the lower half of the nose is compared to lower facial midline, it appears symmetric. In these patients the midline of the nose is following the asymmetry of the face, and it will be impossible to make the nose straight without compromising facial aesthetics.
- **Lateral view:** On the lateral view, the landmarks should include the glabella, radix (nasion), nasofrontal angle, supratip, tip-defining points, infratip lobule, columella,

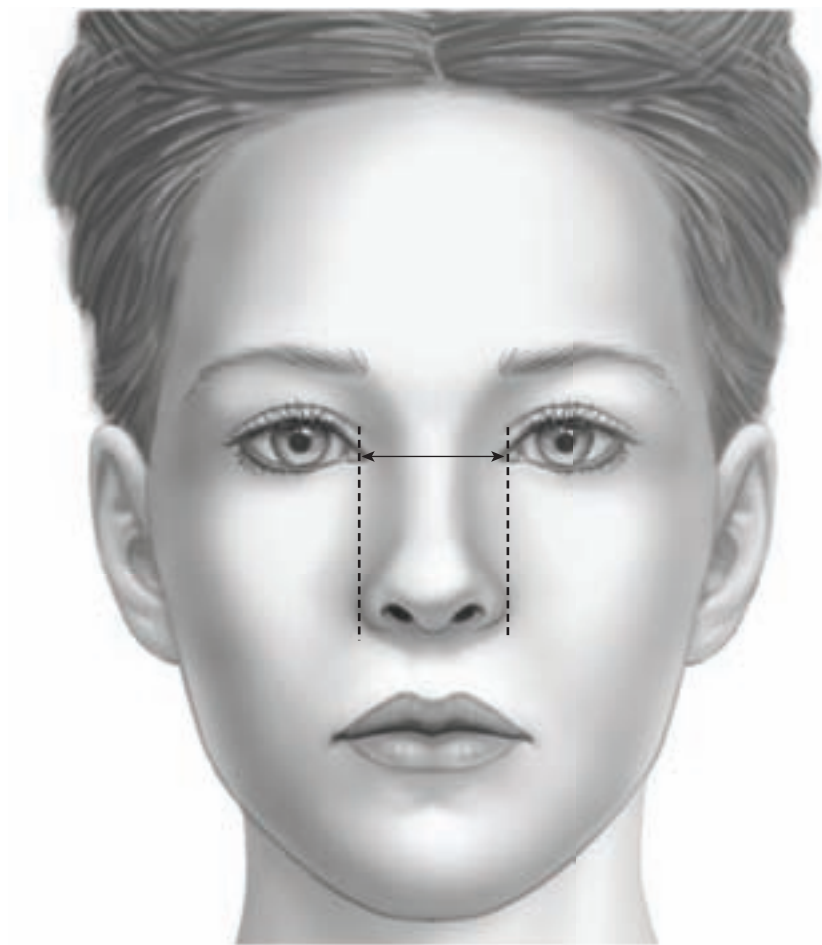


Figure 6-7. Alar width as it approximates the distance between the medial canthi.



Figure 6-8. Dorsal aesthetic lines.

columella-labial angle or junction, and alar-facial groove or junction (Figure 6-9).

- *Radix (nasion)*: This point is defined as the junction of the frontal bone and the dorsum of the nose. Two measurements are used to describe the radix: anterior projection and level. The nasion should ideally project approximately 15 mm anterior from the level of the medial canthus and 11 mm anterior to the corneal surface or at a distance 4 mm to 6 mm behind a vertical line tangential through the glabella. The ideal level of the radix should approximate the tarsal edge or the upper lid crease.^{9,10}
- *Dorsum*: On the lateral view, analysis of the nasal dorsum begins at the nasion. Inferior to the nasion, the paired nasal bones may take various forms, either naturally or as the result of trauma. The congenital dorsal hump is often comprised of bone in the superior half and cartilage in the inferior half. The bones themselves may be high or low off the face, shallow or broad, concave or convex, straight or deviated. Their junction medially forms the dorsum. *Low radix disproportion* is a term that refers to a dorsal line that, when seen from the lateral view, begins below the level of the upper eyelid margin when the patient's eyes are held in primary gaze.¹¹ It is one important cause of nasal imbalance in which the upper part of the nose appears too small in relation to the lower part. The junction between bone and cartilage may be appreciated by

identifying the edge of the bones laterally and palpating their course as they extend medially.

- *Nasofrontal angle*: This angle is formed by intersecting lines between the nasal dorsum and a line parallel to the infrabrow glabella (Figure 6-10). In female patients, the ideal angle is roughly 134 degrees while in male patients the angle is slightly less, about 130 degrees.^{12,10} In both genders, the measurement can vary by ethnicity as well.
- *Nasal tip projection*: Careful analysis of tip projection is important because the final tip projection will dictate the height of the dorsum (Figure 6-11). For this reason, tip projection is achieved before dorsal modification. The appearance of the tip should be evaluated in isolation and as it relates to the nasal dorsum and upper lip. Several methods can be used to measure tip projection and utilizing all three may aid in differentiating the underlying etiology of the problem. Measured from the alar crease to the nasal tip, tip projection should be about two thirds of the distance of nasal length (Figure 6-12). A second measurement is to see if the amount of tip projection approximates the width of the alar base. Finally, if upper lip projection is normal (see nasal orthognathic relationship), a vertical line is drawn tangential to the upper lip, and normal nasal projection is present when between 50% and 60% of the nose is anterior to this line (Figure 6-11).^{13,14,15}

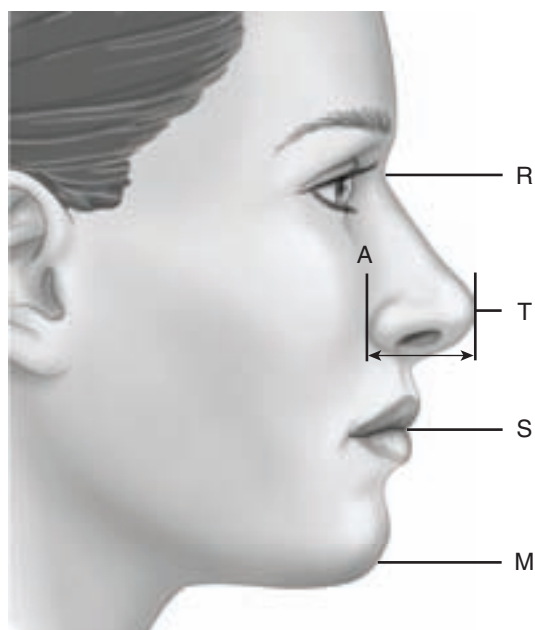


Figure 6-9. Important landmarks on lateral facial profile (R, radix; A, alar groove; T, tip; S, stomion; M, menton).

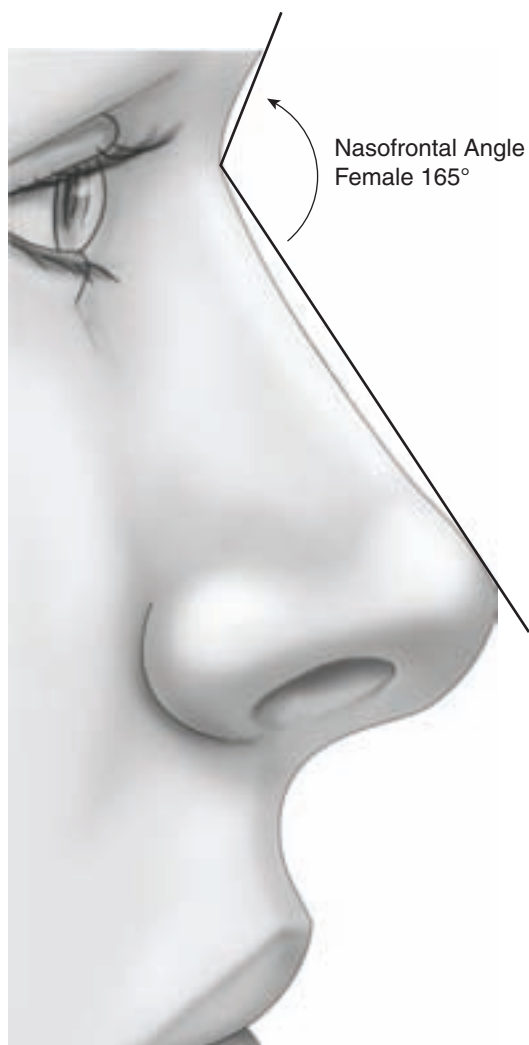
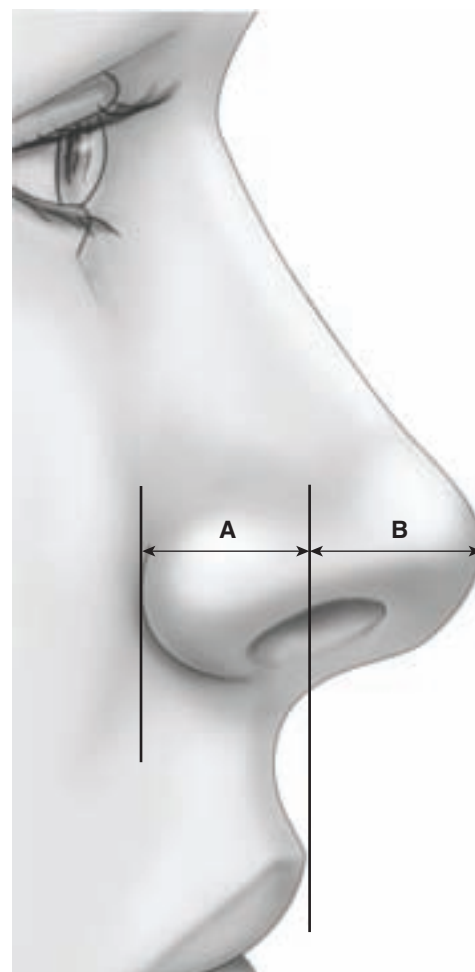


Figure 6-10. Normal nasofrontal angle in the female patient.



Nasal Projection
 $A = 50-60\% \text{ of } A+B$

Figure 6-11. Estimation of normal nasal tip projection.

- *Nasal length*: The ideal nasal length measured from radix to the tip-defining points should approximate the distance from stomion to menton¹⁶ (Figure 6-9). Another approximation for normal nasal length is that the nasal length to tip projection ratio should be about 1:0.6 (assuming tip projection is normal). The perceived nasal length can be affected by the nasofrontal angle. If the nasofrontal angle is more anterior and superior, the nose may appear longer. In contrast, if the nasofrontal angle is positioned posterior and inferior, the nose may look shorter. The radix may be altered to treat this problem.
- *Nasolabial angle (tip rotation)*: The caudal extent of the septum and the anterior nasal spine of the midline maxilla are most important in determining the angle between the nasal base and upper lip (Figure 6-13). This relationship is created by the intersection of one tangent along the course of the columella and a second tangent along the upper lip. This angle measures approximately 100 to 105 degrees in females and 90 to 95 degrees in males.¹⁷ Influencing factors on this angle include the upper maxilla, the soft tissue volume of the upper lip, and the inclination of the central dentition. The appearance of the nasolabial angle should be evaluated in repose and with smiling. An acute nasolabial angle and a tip that does not recoil to its prior position after gentle downward pressure indicates a loss of tip support.
- *Alar-columella relationship*: The lateral view is also a favorable way to evaluate the relationship between the alar rim and the columella (Figure 6-14). Both structures should be curved slightly away from the other, leaving an oval with roughly 2 mm to 3 mm of show on lateral inspection. If one were to bisect the opening axially, an equal amount of columella should be seen above and below this line. Causes of excess columella show include an alar rim that rides too high, a columella that hangs too low, or a combination of the two. Proper treatment begins with identifying the etiology and specifically addressing the cause. Conversely, patients who have too little columellar show might be manifesting a low alar rim, a retracted columella, or a combination of the two.
- *Chin-lip relationship*: The lower lip and the nose play an important role in chin aesthetics. Several tools can be used to assess chin projection. If nasal length is ideal, a line can be dropped from the mid-dorsum of the nose inferior and tangential to the upper lip. The chin should be about 3 mm posterior to this line according to Byrd.¹⁸ Another method is to drop a line inferior and perpendicular to Frankfurt horizontal that is tangential to the lower lip. The chin should be just posterior to this line in females and at or slightly anterior to it in males. A final analysis is Riedel's line. This line connects the most prominent points of the upper and lower lips. The most prominent point of the chin should be the third point on this line.¹⁹
- *Nasal orthognathic relationship*: When a patient presents with concerns about the size of the nose, it is important to assess the position of the jaws and the occlusion of the teeth. It is not uncommon for a patient with complaints about a large nose to in fact have a small mandible or posterior chin point. The retraction of the upper incisors that results from dental compensation allows the upper lip to fall posteriorly, giving the illusion of an overprojected nose. Advancing the mandible or chin as indicated frequently reduces this overprojected appearance.

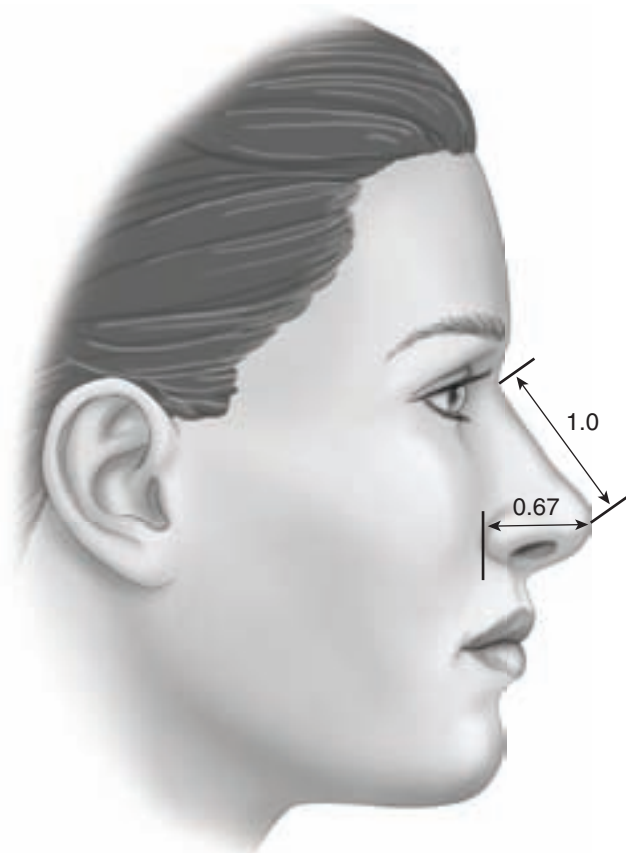


Figure 6-12. Evaluation of nasal length.

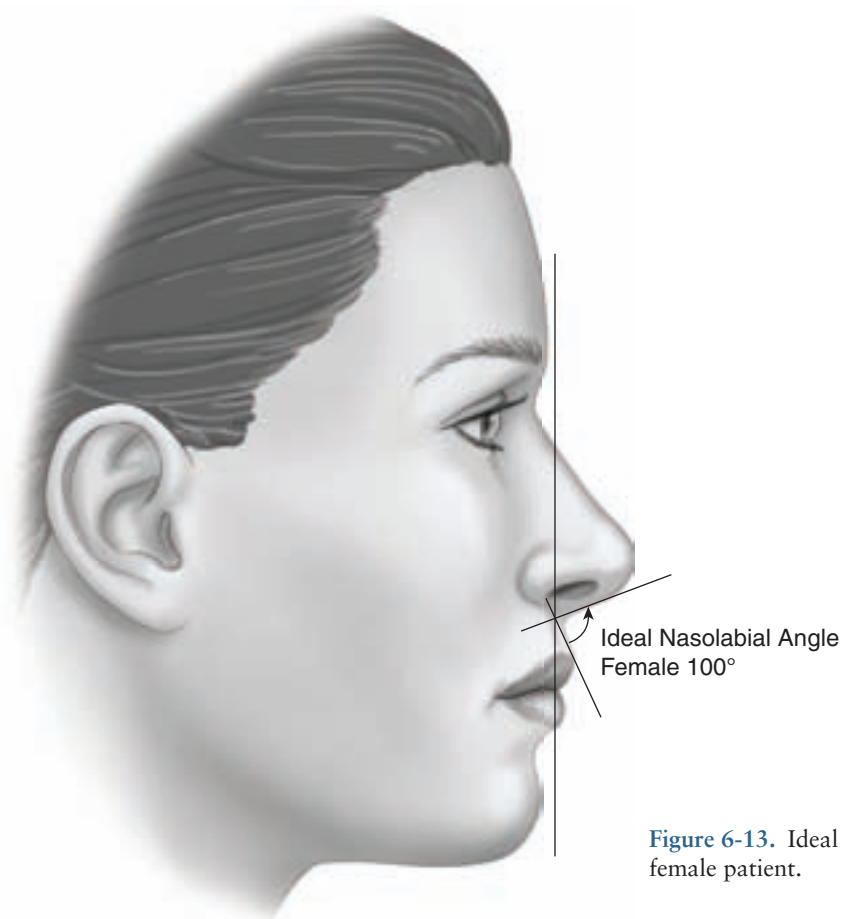


Figure 6-13. Ideal nasolabial angle in the female patient.

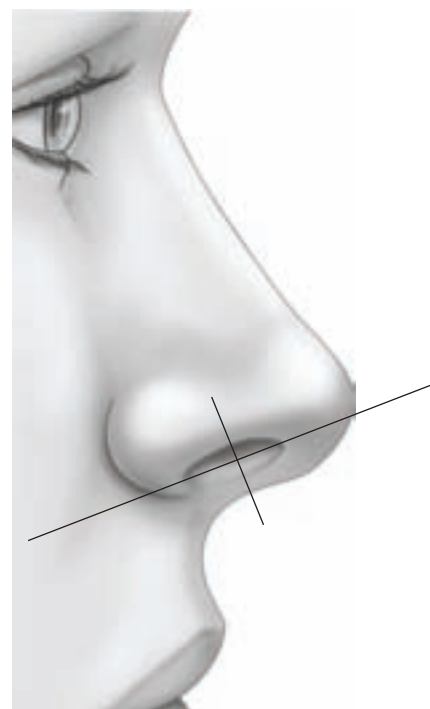


Figure 6-14. Appropriate lateral columellar show.

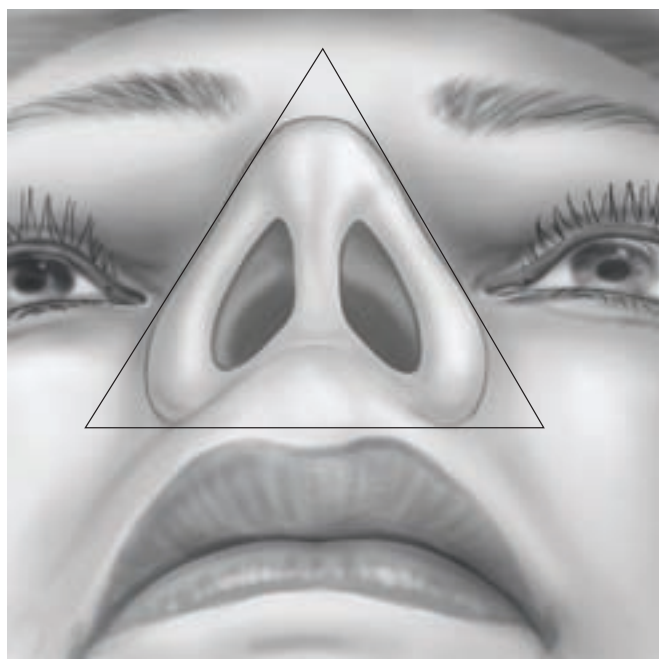


Figure 6-15

- **Worm's eye view:** On basal view, the landmarks should include the infratip lobule, columella, alar sidewall, facet or soft-tissue triangle, nostril sill, nasolabial angle or junction, alar-facial groove or junction, and the tip-defining points.
 - *Alar base:* Inspection of the nose from a “worm’s eye” view with the neck extended and the patient gazing skyward is the best way to appreciate the nasal base (Figure 6-15). The nasal base consists of paired and unpaired structures. The columella exists centrally and contains the medial crura of the lower lateral cartilages. The nasal base should approximate an equilateral triangle, and the nostril should be about 50 to 60 degrees relative to a vertical line through the columella. It is bordered by the soft triangles anteriorly, the lateral walls, the alar bases, and the nostril sills. The soft triangles lie anterior to the middle crura and are composed of external skin opposed to internal mucosa. They contain no cartilaginous elements. The nostril sill extends from the terminal extent of the alar rim at the junction of the face to the columella. It may be flat or rolled. The shape of the nostrils is highly variable and usually asymmetric. Their orientation is largely oblique but may be more horizontal or vertical. The ideal nostril-infratip ratio should be between 60:40 to 55:45.²⁰ The widest point between the alar rims is usually several millimeters superior and lateral to the lateral extent of the nasal sill crease. The width of the alar base should be narrower than the distance between the medial canthi. The boxy nasal tip is characterized by a broad, rectangular appearance of the tip lobule complex.

- Not all ethnicities share the same normative appearances. Variation in nasal anatomy should be recognized and understood.
 - *The African nose:* The African nose is characterized by a dorsum that is wide and shallow with a low radix. Nasal length is shorter and interalar width is greater. The tip exhibits less projection, and because of thicker skin, the tip typically lacks definition. The columellar-labial angle is acute.²¹
 - *The Asian nose:* The Asian nose can be characterized by a low nasal bridge and an underprojected dorsum. Japanese patients may be unique among Asians as having a convex dorsum. Tip projection is less than that of Caucasian noses, and the tip is characterized by a rounded, ill-defined tip that frequently lacks a supratip break. The nasolabial angle is more acute and the alar base tends to be wider than the Caucasian norms. Alar flaring may also be more prominent in Koreans due to variations in the dilator naris muscle.²²
 - *The Latin nose:* The typical Latin nose was described by Ortiz-Monasterio as having thick skin, a narrow osseocartilaginous vault, minimal tip support, a short columella, and a broad alar base.²³ However, the term “Latin” broadly covers a group of significant ethnic diversity. In the United States with the cultural melange that is unique to our country, the typical Latin nose is not necessarily associated with every Latin patient. Daniel described his observations of Latin diversity in a California practice and found that the Latin nose is on a continuum between the Caucasian nose and that of the Mestizo or Caribbean nose. Therefore, the treatment should be individualized to the patient and their desires.²⁴
 - *The Middle Eastern nose:* Rhinoplasty is a popular operation among patients of Middle Eastern descent, and it is important to understand the nuances of the Middle Eastern nose. The dorsum tends to be wide with a dorsal hump, and the radix is typically high and shallow. The tip tends to lack definition and projection. A droopy tip is common among these patients as well. Thick sebaceous skin overlies this anatomy making the Middle Eastern rhinoplasty a challenging endeavor.²⁵
- *Similarly, male and female noses have normative differences.*
 - The nasion in females should be lower and more shallow than males.
 - The dorsum in females should be straight or slightly lower than a line drawn from nasal tip to radix.
 - A supratip break is desired on the female nose but may feminize the male nose if overdone.
 - Females can tolerate a narrower nasal base and interalar distance.¹⁷
- All patients should have preoperative photographs taken. Two-dimensional images provide an excellent

way to logically think about the aesthetics of the face and frequently identify concerns not immediately identified in the examination. Six standard views should be obtained for all patients. These include a square frontal view, two opposing oblique views, two opposing lateral views, and a worm's eye view, which is taken from below placing the tip of the nose between the eyebrows for standard comparison (Figures 6-1 to 6-6). It is important to utilize standardized lighting, object-film distance, and camera settings.²⁶ With advanced digital SLR cameras, postoperative adjustments can be made to create a 1:1 ratio and compensate for some variation using digital darkroom software such as Adobe Lightroom™ (Adobe Systems Incorporated, San Jose, CA).

- Digital imaging and computer morphing may be helpful aids in helping a patient understand their concerns and goals. Not infrequently a two-dimensional image may allow the surgeon to identify aesthetic abnormalities that were less obvious on the actual physical exam. The patient should be informed that a morphed computer prediction image is not a guarantee of the result but an image to ensure that the patient and surgeon both have the same goals in mind. One should not proceed with the surgery unless the surgeon feels confident that the patient's goals are clearly understood and realistically achievable. If after these techniques, the patient cannot clearly state what he would like to change, it is advisable to decline treating the patient. The surgeon will never be successful correcting something that the patient cannot identify. Historically, there was a fear that a digital image would lead to higher malpractice claims because the patient did not receive the "guaranteed" result; however, these fears have been unsubstantiated.²⁷ In fact, some experienced surgeons feel that conservative digital morphing may actually lower patient expectations and result in increased satisfaction with the actual result.²⁸
- Following direct and photographic examination, the first step is to develop a prioritized problem list. The second step is to tape a piece of clear acetate tracing paper (ordered through any dental supply company or art store) over the patient's photographs and trace in pencil the ideal or desired nasal dimensions. Finally, based on the surgical goals and surgeon's abilities develop an operative plan. It can be useful to mentally perform the surgery and record the steps sequentially on a separate sheet of paper that can be brought to the operating room and placed near the photographs. This surgical plan can then be checked intraoperatively to make sure a step is not missed during the operation. Presurgical operative sequencing also increases the efficiency of the operation by allowing all involved in the operative care to know what the steps are and to have the appropriate materials avail-

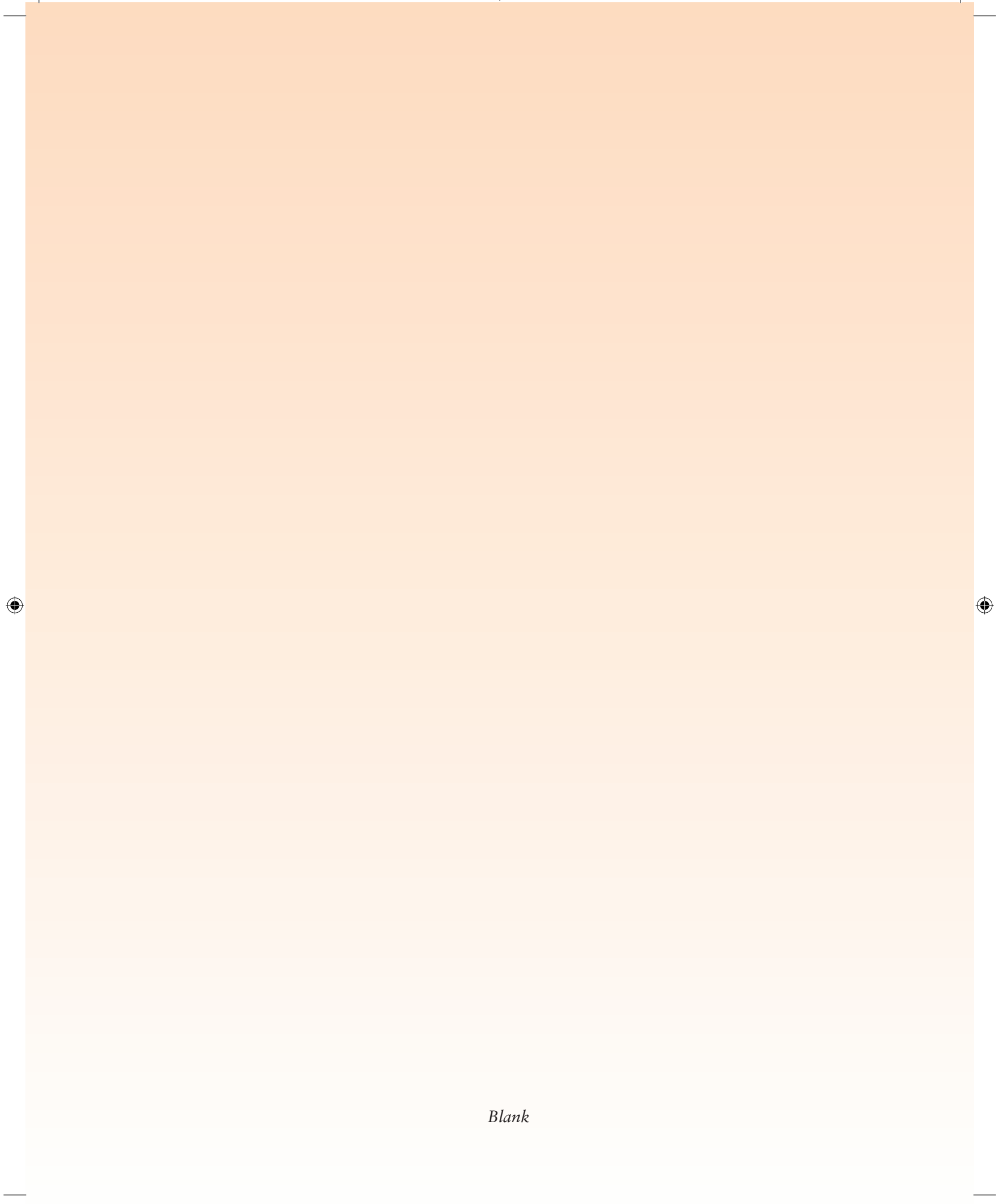
able in a timely manner. For more novice surgeons, a conservative management plan should be chosen. Unachievable, unrealistic, or undesirable procedures should be eliminated.

- Rhinoplasty for male patients is common, as men similarly desire improvement in either the appearance or function of the nose. While women are more open about plastic surgery, men tend to be more private. Similar to their female counterparts, male patients may present with displeasure about the appearance of their nose. They may want to alter the size or shape of one or more key components. Men will also present with respiratory issues, such as snoring, related to their nose. While the techniques are similar, the goals for rhinoplasty in the male are different. The acronym "SIMON" (single, immature, male, overly expectant, narcissistic) has been used to denote warning signs of the difficult male patient.¹⁷ If these signs are present, a psychiatric consultation should be considered.
- The surgeon should always be aware of patients with body dysmorphic disorder (BDD). Before considering operative correction, the surgeon should be able to identify the problem of which the patient is concerned and feel capable to address this safely. Patients who are overly concerned with a problem, which the surgeon cannot recognize, may have elements of BDD. These patients will frequently not be satisfied with the results following surgery or turn to another concern, which may or may not be based in fact.

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