

Mastering the art of lip rejuvenation: identifying patterns and techniques

Abstract

Dermal fillers can correct age-related perioral volume loss, augment lips that are 'caving in' and add definition to thinning lips. In this article, the author will review factors associated with lip ageing, outline ideal lip proportions and introduce a variety of techniques to enhance lip shape. The author will aim to educate aesthetic nurses on the unique intricacies of artistic lip enhancement with hyaluronic acid dermal fillers. After reading this article, it is hoped that practitioners will be able to identify different lip patterns and distinguish different injection techniques to produce different aesthetic outcomes.

Key words

► Lips ► Dermal fillers ► Hyaluronic acid ► Injection technique ► Perioral complex

Dermal fillers have been used to augment the lips since the approval of bovine collagen. However, following the inception of hyaluronic acid (HA) dermal fillers, aesthetic practitioners have now transitioned exclusively to the use of these injectables for lip rejuvenation. With the increased administration of HA dermal fillers, lip enhancement is now one of the most frequently requested treatments in medical aesthetic clinics (Brandt and Cazzaniga, 2008; Kane et al, 2012). In this article, the author will discuss the development of the lips, explore common signs of ageing in the perioral area, and advise aesthetic practitioners on key considerations for injecting the lips and perioral complex.

Lip augmentation: the most misunderstood aesthetic procedure?

Celebrity culture has played a significant part in popularising lip augmentation procedures, as voluptuous lips are often portrayed as a symbol of youth and associated with sex appeal and romance in Hollywood films (Dayan, 2011). However, celebrities have also made lip augmentation infamous and caused it to be the most

misunderstood treatment aesthetic practitioners offer in their clinics today. Patients are frequently fearful of looking 'fake' and having 'duck lips' or a 'trout pout' owing to overtreatment, improper product placement, and/or not respecting the lip's natural shape. This is one of the biggest obstacles to convincing patients that lip augmentation would be an attractive option.

The lips should not be the first thing people notice when an individual walks in the room. By addressing the perioral complex in addition to the lips themselves, practitioners can avoid this happening. However, if patients present to an aesthetic clinic with an existing 'trout pout', this can be corrected with hyaluronidase or through 'blending' the lip into the face by addressing the perioral complex (*Figure 1*).

Development of the lips

In utero, the upper lip forms from three tubercles—one from the middle and two from either side—creating the slight projection in the centre of the upper lip below the philtrum. When the three tubercles fuse together, the Cupid's bow is created, leaving three distinct 'containers'. The Cupid's bow is comprised of two vertical columns of tissue, creating a midline depression called the philtrum dimple. The lower lip forms from two separate tubercles, which fuse together in the midline, resulting in one continuous piece comprised of two 'containers' (Maloney, 1996).

Lips reach their peak fullness at 14 years (Etoff, 1999). During this time of puberty, the glandular tissues in the lips begin to blossom, filling the lips to their full plumpness. The lips also appear redder as the decrease in density of keratin reveals the underlying capillaries of the translucent tissue (Raine-Fenning et al, 2003). However, during the thirties and forties, the lips start to shrink and lose their colour with the decline in hormones (e.g. oestrogen).

Occasionally there could be a variance in the lower lip which demarks lip 'containers' in a greater distance, resulting in a lower lip that has two very distinct protuberances on each lateral aspect of the lower lip, and making the lower lip appear to have a small 'seam' in it (*Figure 2*). Practitioners should visualise these 'containers' when augmenting the lips, as a dermal filler is by nature a liquid that naturally takes the shape of its surrounding 'container'. As these 'containers' are a predetermined shape, it is difficult to change the shape of



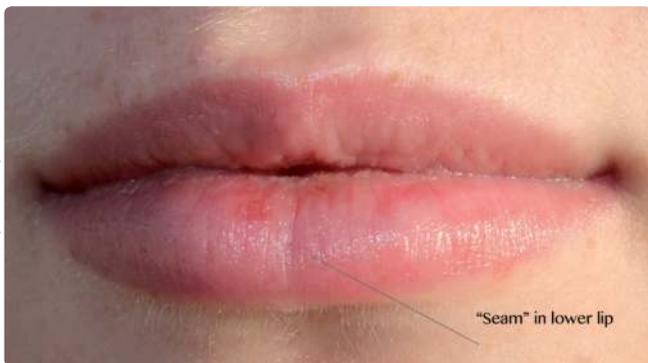
LESLIE FLETCHER

Aesthetic Nurse Specialist, USA.
e: info@arquederma.com



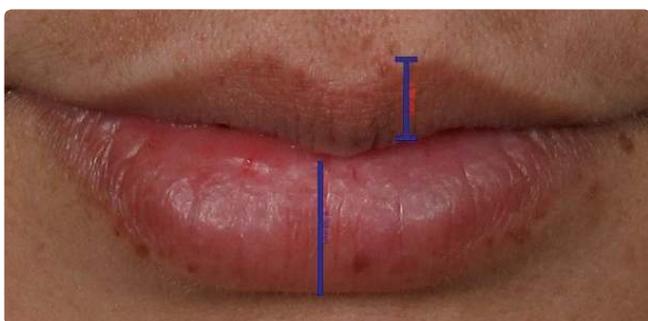
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Figure 1: Lips appear more natural after injections



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Figure 2: Seam in the lower lip



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Figure 3: Ideal lip ratio on the frontal view

the lips too significantly, but it is very possible to 'swell' the 'containers' a bit. However slight, on such valuable real estate as the lips, even a few millimetres can make all the difference (Figure 2).

Signs of ageing in the lips

During early adulthood, there is a shift in skeletal proportions in the mid-face. The loss of craniofacial skeletal support to the overlying soft tissue reduces space for facial soft tissues in this region and leaves tissues to reposition in an accordion-like manner (Vlegaar and Fitzgerald, 2008). Along with fat atrophy, this early-onset osteoporosis causes one of the most distinct signs of ageing—perioral wasting—where involution of the lips causes them to collapse and shrivel up, making it appear as if the mouth is 'caving in' (Klein, 2005).

During youth, the lips evert when smiling and reveal the teeth (Jacono, 2008; Sarnoff and Gotkin, 2012). However, during the ageing process, the lips start to invert with smiling and hide the teeth. Ageing also leads to a clear flattening of the Cupid's bow and lengthening of the upper lip as the vermilion ('bright red pigment') becomes thinner and more involuted (Sarnoff and Gotkin, 2012; Wollina, 2013).

Overuse of the orbicularis oris muscle breaks down the soft tissue, creating perioral rhytides or 'lipstick lines' (Sarnoff and Gotkin, 2012). In youthful lips, a fine line of pale skin accentuates the colour demarcation between the vascular areas of the vermilion and normal epidermal tissue of the face. However, with age, a lightening of the vermilion can be seen, which results in the loss of sharp demarcation of the vermilion–cutaneous junction (Sarnoff and Gotkin, 2012). It is important for practitioners to replace this early sign of deflation in the lips by injecting the vermilion border ('white roll') with a small amount of dermal filler (total of 0.3–0.5 ml). Redefining the vermilion border will create the frame for the final masterpiece.

Ideal lip proportions

The ideal lip ratio on the frontal view is 1:1:6, which translates to around 40% of the lip volume in the upper lip and 60% of the lip volume in the lower lip (Figure 3). Further to this, the width of the mouth horizontally should be equal to one and a half times the width of the nose (Sarnoff and Gotkin, 2012).

Artistic lip augmentation will result in definitive transition points with an elevation of the lateral commissures (Matarasso, 2008). Ideally there should be a crescendo, building up to the centre on both the top and bottom lip, so the fullest portions of the lip are rounding out in the middle. Accentuating the lips with dermal filler should always yield a natural, three-dimensional enhancement of the contours of the female lip, while also defining the shape.

It is important to note that, although certain ethnic groups (e.g. African, Asian and Hispanic) will often display more voluminous lips from an early age, and tend to keep this volume for most of their lives, this does not always preclude them from wanting to maintain lip fullness and definition with dermal fillers.

Treatment areas

Perioral complex

An important anatomical area to consider when augmenting the lips is the perioral complex. Surrounding tissues set the tone for what the patient perceives as a youthful mouth; areas such as the nasolabial folds and cheeks, as well as perioral volume loss, contribute to the overall support of the lips. The position of the upper lip can even be lifted by effacing the nasolabial folds through elevating the cheeks (Wollina, 2013).

Subtle perioral volume

One of the best solutions for treating perioral rhytides or 'lipstick lines' is to support the area around the lip with subtle perioral lip volume. By injecting horizontally across the radial lip lines, the lines become effaced by the expansion of the tissue. This can be done using a low 'G prime' HA product with a 1 inch (either 30 gauge or 32 gauge) needle, with the insertion point being at the philtral column approximately 3 mm superior to the vermilion border. Advance the needle all the way, inject a retrograde 'thread' of about 0.1 ml across the area, ending at the philtral column, and repeat on the contralateral side. When inducing subtle perioral volume, there should be an even dispersion and smooth delivery of dermal filler.

The same technique can also be applied to the lower lip approximately 3 mm below the vermilion border, beginning in the centre of the lip and ending at the commissure. Inject a retrograde 'thread' of about 0.1 ml and repeat on the contralateral side. The dermal filler will give a subtle eversion to the upper and lower lip, as well as reducing the appearance of perioral rhytides, acting as a 'dam' or 'barrier' confining the lipstick so it does not bleed into the wrinkles, creating 'lipstick lines'.

Injecting the vermilion border can also very successfully improve the appearance of perioral rhytides. Approximate amounts for this area range from 0.3–0.5 ml for the entire vermilion border. The dermal filler is best injected in a 'threading' manner into the potential space that runs the perimeter of the lips.

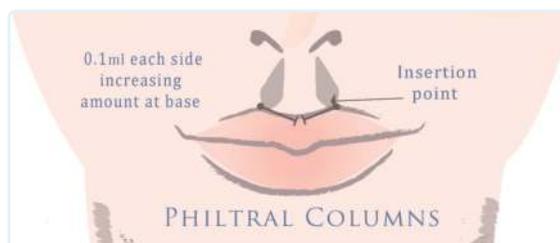
Philtral columns

The lengthening and flattening of the upper lip is a clear indicator of ageing. By re-establishing the philtral columns, the area above the lip can be curved slightly, thereby shortening the distance between the upper lip and nose. Pinching the tissue between the thumb and index finger will create a 'mould' for the philtral column. Insert a half-inch needle at the vermilion border and advance the needle towards the nasal columella. Inject around 0.1 ml per philtral column in a retrograde threading fashion, adjusting the dose on the way down so that the majority of the product is placed closest to the lip. This will give an additional lift, and create a more natural, curved crescendo towards the lip (Fig-



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Figure 4: Before and after philtral central volume exaggeration



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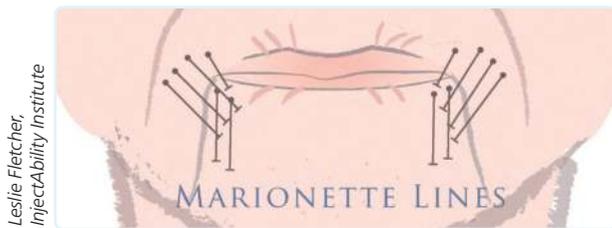
Figure 5: Injection technique for the philtral columns

ure 4). Repeat this on the contralateral side. Hold the area between two cotton tip applicators to 'set' the columns and highlight the philtral dimple (Figure 5).

Oral commissures and marionette lines

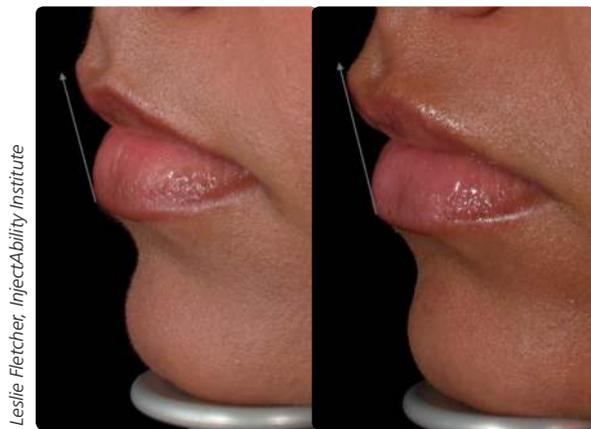
Gravity, osteoporosis, dental changes and soft tissue volume loss leave the lips unsupported, causing them to start to overhang into the oral commissures (Sarnoff and Gotkin, 2012). As the commissures go untreated the tissue can descend even further into the marionette lines, leading to a perpetual frown. The area medial to the commissure and marionette line should be addressed for this to be corrected.

There are several ways to tackle this area and practitioners may choose one or all patterns based on the patient's needs. First and foremost, the 'thumbprint' area—the area of volume depletion bilaterally between the lower lip and the chin (Figure 6)—needs to be volumised. This is most easily done by vertical 'posts', which are referred to by the author as 'goal posts', placed medial to the marionette. This correction at the lateral angles of the mouth serves as both a 'dam' to the marionette lines and a 'buttress' to the lower lip. Around 0.1–0.2 ml of HA product should be used here. Insert your



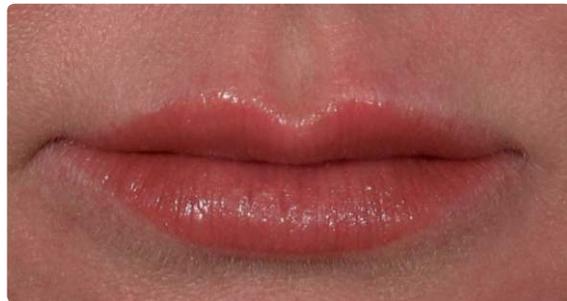
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Figure 6: Injection technique for the oral commissures



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Figure 7: Before and after fixing proportions of upper lip



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Figure 8: Before and after reshaping upper and lower lip

half-inch or 1-inch needle medial to the commissures and proceed to thread the dermal filler down towards the jawline. Retrograde thread the product all the way until exiting the skin and repeat this on the contralateral side. Second of all, injector should address the lateral aspects of the lower lip to elevate the downturned corners. The same should be done on the upper lip where small amounts of material are injected laterally to avoid an upper lip that rolls in, putting additional pressure on the oral commissures (Figure 6).

Lips

Although there is no perfect injection pattern for every patient, there are certain constants that transcend even the most unique lip shapes. Look out for the natural prominences and protuberances that occur in all patients and highlight them with the HA dermal filler (Sarnoff and Gotkin, 2012). In general, the goal in treating the upper lip is to artistically create a shape that matches the patient's unique facial features as well as his or her own design aesthetic (Figure 7). The goal of treating the lower lip is to create greater symmetry, prominence and projection of the vermillion, as well as providing a curve (Sarnoff and Gotkin, 2012) (Figure 8).

Start injecting at the vermillion border using around 0.2–0.5 ml of HA dermal filler. These injections will generally be intradermal and most commonly use a retrograde tunnelling technique (Fagien et al, 2013). After the vermillion border has been treated, the subvermillion area, which is the natural border between the junction of the vermillion border and the body of the lip (Jacono, 2008) should also be addressed. This injection pattern will be parallel to the vermillion border injections, but around 2–4 mm below (Figure 10). The injection plane in this area is generally in the subdermal region (Fagien et al, 2013).

The temptation may be to go straight to the wet–dry border when trying to increase volume in a patient's lips; however, if practitioners miss the importance of treating the entire lip, as well as the perioral complex, solely focusing on volumising the wet–dry border, they could easily end up creating a 'sausage look'. Additionally, increasing the volume inside the lips will slightly decrease the visibility of the teeth, which may unintentionally make the patient appear older. Practitioners should inject this area as a last resort to volumise and reshape the lips. When injecting the wet–dry border, practitioners should use only the smallest amount (0.2–0.5 ml total) to enhance the curve of the lower lip.

Practical considerations

Before and after photographs

Before injecting any patient, it is vital to take baseline photographs from a frontal and oblique view. The injection of lips will bring about the keen observation of asymmetry; if this is not observed before the injection, then it definitely will be after. Photos of a still patient will help identify these asymmetries. If it turns out that the patient is asymmetrical, aesthetic practitioners should gently point this out before injecting and encourage him or her that the aim of treatment is to attempt to make this asymmetry less apparent.

Choice of product and consent

There are various HA-based dermal fillers on the market that could be appropriately injected into lips, however some of them are not approved for this area (e.g. Voluma,

Allergan) (Kane et al, 2012). When choosing a suitable product, it is useful to consider asking the patient to sign a consent form that is specific for that product. Consent should cover the possibility of asymmetric oedema and bruising, as the lips are very vascular and prone to these common side effects. During any discussion about consent, it is best to address the patient's specific goals for treatment, such as:

- ▶ Is the goal volume enhancement or wrinkle reduction?
- ▶ Does the patient want subtle results?
- ▶ Does the patient have a particular shape in mind?

Aesthetic practitioners should, within reason, listen to the patient's desires and preferred design aesthetic. If this preliminary screening occurs, the perception of a successful treatment for the patient is much more likely, especially in the case of preventing augmentation when definition of lip was the goal. However, owing to the hydrophilic nature of HA dermal fillers, the final outcome should not be judged until 1–2 weeks post injection.

Bruising and viral response

At the consultation, any medications and/or blood-thinning drugs the patient is taking should be noted to determine the possibility of bruising. To prevent a viral response induced by lip injection trauma, ask the patient about any significant history of cold sores and decide in line with the clinic's protocol if the patient should be pre-treated with antiviral medication.

Pain relief and infection control

As there are several nerve endings around the mouth, the lips can be a particularly painful area to inject. A topical anaesthetic can be applied 20 minutes before the procedure. Alternatively, if it is in line with clinic protocol, practitioners may even consider an infraorbital and mental nerve block to anaesthetise the area. However, as the majority of HA-based products now contain lidocaine, a nerve block is often not necessary.

Immediately before injecting the lips, the treatment area should be cleansed with alcohol or chlorhexidine wipes (Sarnoff and Gotkin, 2012). Ice can also be used to decrease pain and bruising; however, the area should always be cleansed again after ice is applied.

Injection techniques

In all diagrams of injection techniques, needle insertion points are represented as 'dots'.

Ageing thin lips

To tackle ageing thin lips (Figure 9), practitioners will need to inject the perioral rhytides and lateral commissures. Perioral lines need to be treated with threading technique described earlier in the article, with injections placed superior to the vermilion border and sub- vermilion area. The area should be injected with a total volume of 1–2 ml.



Figure 9: Perioral volume loss and lip inversion

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Figure 10: Injection technique for thinning lips

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Figure 11: Injections for overall volume enhancement

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Figure 12: Injection technique for enhancing lips

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Lips needing overall volume

Using a retrograde threading technique, the vermilion border and sub-vermilion area should be injected (Figure 10). A small amount can also be injected into the wet–dry border. The area should be injected with a total volume of 1–2 ml.

'Hollywood lip'

The 'Hollywood lip' refers to upper and lower lips of equal size, both with exaggerated width, and a flattened Cupid's bow (Sclafani, 2005). Inject the sub-vermilion area laterally to enhance lip fullness (Figure 11). Philtral column injections should be avoided as this point is not the focus of this type of lip. Owing to the fact that the volume in this lip shape is not centrally highlighted, the volume injected within the red wet–dry border should be mostly injected on the lateral aspect of the lips,

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Figure 13: Before and after lip volumisation with 1 and 2 syringes

with a smaller amount injected into the middle lower lip. The area should be injected with a total volume of 1–2 ml.

'Scarlett Johansson lip'

The 'Scarlett Johansson' lip refers to a prominent Cupid's bow, fullness exaggerated in the centre of the upper lip and lower lip 'pillows'. Inject uniformly in vermilion border and sub-vermilion area to maximal fullness. Bolus 'rods' should be injected into the upper and lower lips to exaggerate the curves of this lip (around 0.05–0.1 ml). Injection within the wet–dry border is optional if more volume is desired. Additional bolus injections in the medial protuberances of the upper and lower lip will give height and curve to upper lip, as well as define two distinct tubercles to the lower lip. The area should be injected with a total volume of 1–2 ml.

'Paris lip'

The 'Paris lip' refers to a well-defined Cupid's bow, demarcated vermilion border and concentration of volume in the central position of the lip, giving a classic 'pouty' lip look (Klein, 2005; Sclafani, 2005). Practitioners should inject uniformly in vermilion border as well as the sub-vermilion area to enhance lip fullness. Injecting a 'rod' from the top of the 'M' of the lip down into the lip with about 0.05 ml on each side will give an additional exaggeration or lift to the medial aspect of the Cupid's bow (Figure 13).

Male lips

Using a retrograde threading technique, inject the vermilion border and sub-vermilion (Figure 14). A small amount of HA dermal filler should also be injected at the wet-dry border. Practitioners should try not to exaggerate any curves or points, as this will feminise the male lips. The area should be injected with a total volume of 1–2 ml.

Potential complications

Lip augmentation could result in irregularities, asymmetries, palpable lumps and the Tyndall effect; however,



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Figure 14: Before and after male lip enhancement

these adverse effects are generally related to injection technique and can be avoided with proper technique, massage and correction with hyaluronidase, if necessary (Sclafani, 2005). To reduce pain, swelling and bruising, it is important for patients to apply ice compression to the lips during and immediately after treatment (Sclafani, 2005).

Haematomas are more common in the wet–dry border as this is where the labial artery runs. As haematomas can cause compression occlusion, this adverse event will need to be treated swiftly with ice and steroids, as well as massage. Patients who develop haematomas post lip augmentation will also need to have daily follow-up observation.

Although rare, true cannulation of the labial artery is also a possibility, particularly in the wet–dry border. Therefore, caution should be taken in this area, as well as scrupulous observation for any blanching and/or lack of perfusion of oxygen to the area. If intravascular injection does occur, it is worth noting that this area is very forgiving owing to the level of collateral circulation (Carruthers and Narukar, 2008). It is imperative to follow the cannulation occlusion protocol of immediate heat, massage, nitropaste and hyaluronidase.

Prolonged oedema and hypersensitivity reactions are also rare and can be treated with ice, intralesional steroids and/or oral steroids to reduce swelling to the area (Carruthers et al, 2008).

Conclusion

Lip augmentation is one of the most misunderstood of all non-surgical aesthetic procedures. Whereas overdone, poorly performed augmentations are noticeable, successful treatments will be so natural that they go undetected. By treating the entire perioral region along

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with the lip itself, aesthetic practitioners will be able to avoid creating 'fake' lips or the infamous 'trout pout'. Occasionally this might mean an extra syringe is needed to treat the entire area; however, when given the option, most patients would prefer natural, seamless results. Just as no two faces are alike, no two lip shapes are alike either. Practitioners should assess each patient's needs and design aesthetic as it relates to the lower face and lips before putting together an injection plan for their lips. The treatment plan should then be carried out according to the patient's existing anatomical structures for a successful, beautiful outcome. ◀JAN

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Key points

- ▶ Patients often misunderstand what lip augmentation looks like. Therefore, practitioners need to educate them that natural results are very attainable
- ▶ The perioral complex (perioral rhytides, oral commissures, marionette lines) must be treated to maintain a natural look where the lips blend seamlessly into the face
- ▶ The lips are formed in predetermined 'containers' and care must be taken to maintain the natural shape of each 'container' when filling them
- ▶ Ageing lips and specific lip shapes require different injection patterns to create separate looks
- ▶ Use of the proper product, placement and technique can help mitigate potential complications