

An anatomical drawing of a human face in profile, facing right. The drawing is rendered in a dark, textured style, possibly charcoal or pencil. It shows the outline of the face, including the forehead, nose, lips, and chin. A grid of thin lines is overlaid on the face, with a vertical line passing through the center of the face and a horizontal line passing through the eyes. The background is a light, textured gray.

Dr Ryan Hamdy

# Midface Injection Anatomy

# For Our Purposes

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- Midface. Zygomatic Region, Anteromedial Cheek and Submalar Region
- Nose complex
- Naso-labial Area

# Overview

Demand for non-surgical procedures is on the rise

In addition our procedures are becoming increasingly complex

HA fillers and neurotoxin have an excellent safety profile

We are becoming increasingly aware of the potential for serious and life changing complications

As a result we owe it to our patients to have a thorough understanding of facial anatomy

## What is Injection Anatomy ?

Injection Anatomy can be defined as the anatomical study of regional surface landmarks and the underlying DEPTH of the target tissue or vital structures

Most anatomy books will illustrate a 2D picture. However we are aware of the vast variability in individual anatomy

What is much more predictable is the consistency in the depth at which vessels pass through tissue

The Face is  
full of blood  
vessels

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So the  
important  
thing is to  
make sure  
that

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We try and stay away from the vessels

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Inject ABOVE

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Inject BELOW

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Be aware of the DEPTH of your needle tip

## Vascular Occlusion

Always the result of intravascular deposition of filler and subsequent embolization

Arterial deposition can result in necrosis and blindness

Venous deposition is usually filtered out by the pulmonary system

Remember filler can travel significant distances which is why cases of blindness have been reported from primary injections anywhere on the face



Vascular  
Occlusion

Common misconception that filler around an artery can cause pressure occlusion

In every case histologically examined filler has been found in the lumen of the artery

Compartment syndrome does NOT occur on the face





## Vascular Occlusion

Remember filler can travel significant distances from the site of primary injection.

Result of the product embolizing and travelling either upstream or downstream

Any delayed complaint of a 'bruise' or colour change away from the injection site should be reviewed

Generally skin colour change at your needle tip will usually indicate a bruise

# Tips to Avoid Intravascular Injection 1

- Understand your anatomy in particular depth and know the danger areas
- Aspirate-remains controversial. False negatives occur as do false positives
- Inject slowly with minimum pressure
- Small aliquots
- Move the needle tip-controversial
- Small needle-controversial
- Use cannula



# Tips To Avoid Intravascular Injection 2

- Adding a vasoconstrictor in the product or before injection-controversial
- Maybe avoid filler with lidocaine ( vasodilator )
- Be cautious with patients who have undergone previous surgery at the injection site
- Always watch the skin and not the syringe

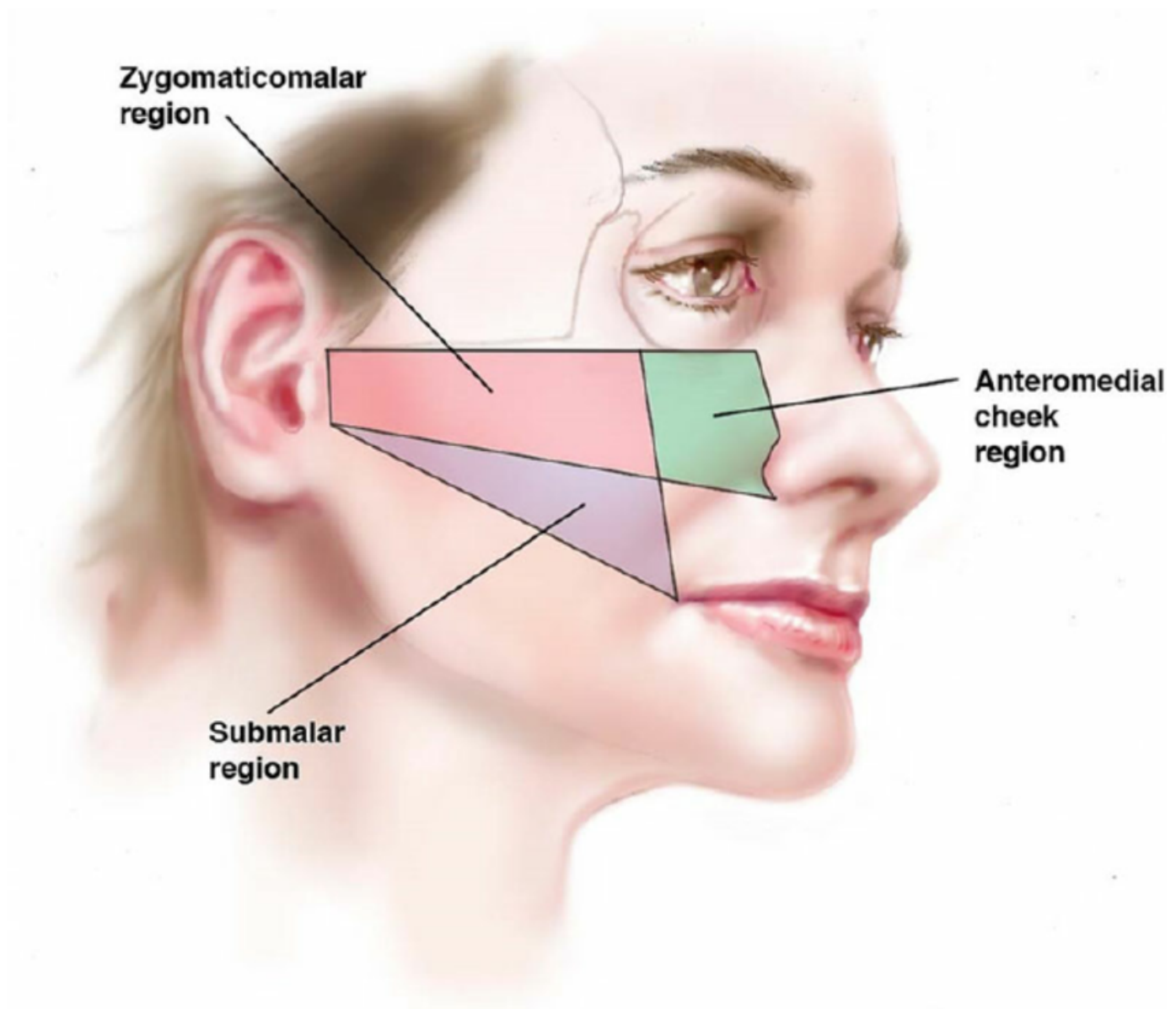


Before  
Injecting Ask  
yourself these  
Risk  
Management  
Questions

- Have I considered other options?
- Do I need to place filler here?
- Is this a high risk area?
- Have I considered the injection anatomy in this area?
- Do I know the DEPTH I can safely inject?
- Should I consider a cannula for injection?
- Have I aspirated?
- Do I feel confident to inject now?

# Midface

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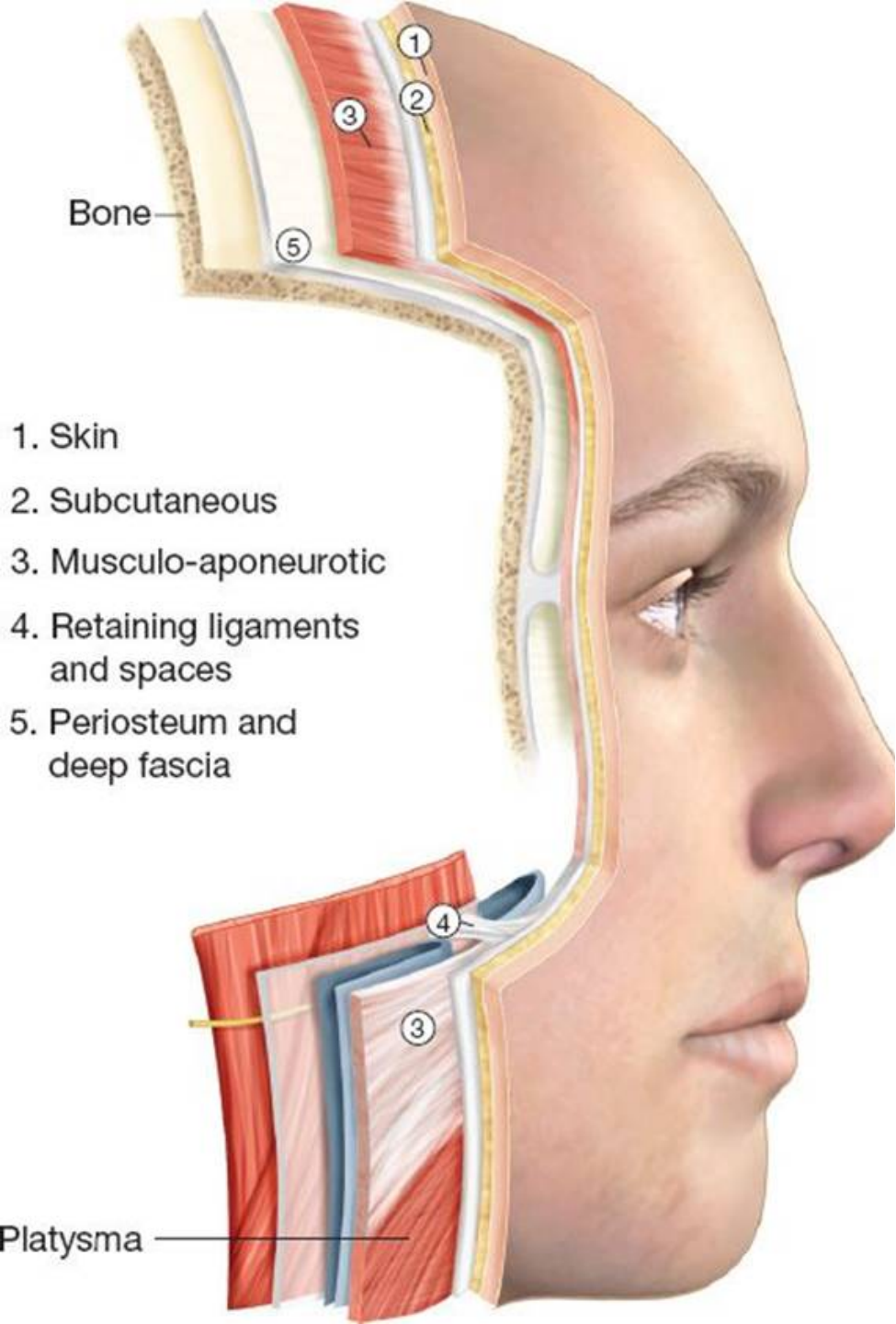


Midface  
Boundaries

Superiorly-line extending from upper tragus and along the upper zygoma

Inferiorly-line extending from lower tragus to corner of mouth

This area can be further divided into anterior and posterior sections by a line extending from the lateral canthus to the corner of the mouth

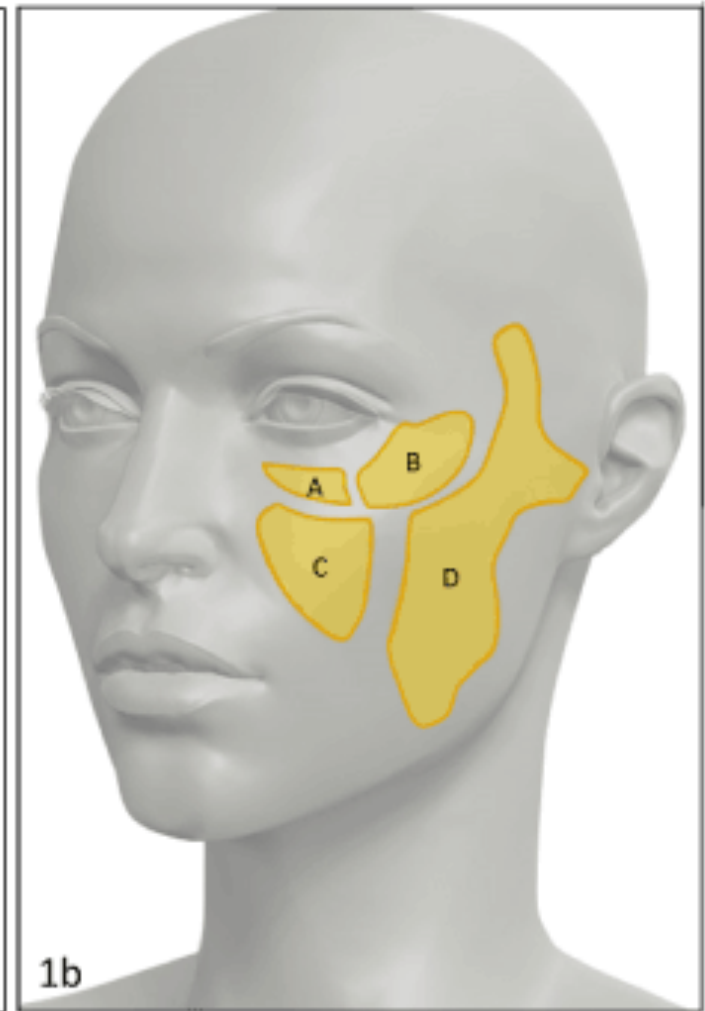


# Anatomical Layers of Midface

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- Skin
- Superficial Fat
- SMAS-muscles of facial expression, parotid fascia, platysma inferiorly and superficial temporal fascia and galea superiorly
- Deep Fat and retaining ligaments
- Bone and Periosteum

# Fat Pads of Face





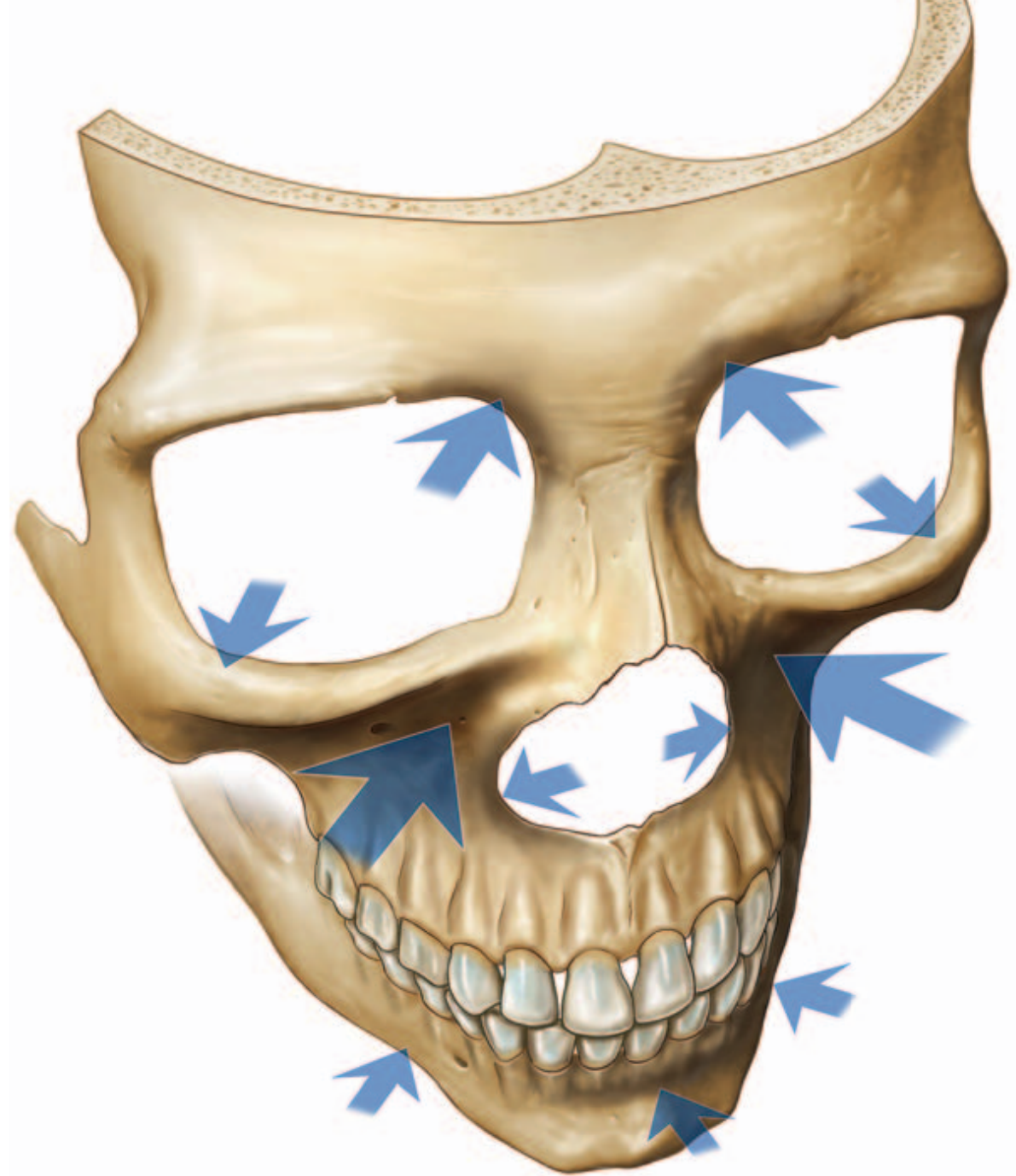
## Fat Pads of Face

Superficial fat pads are separated by fibrous septae ( Rohrich and Pessa ). With age they are characterized by separation, hypertrophy anteriorly, atrophy laterally and some degree of ptosis.

Deep fat pads are characterized by atrophy and inferior migration with age.

# Bone of Midface

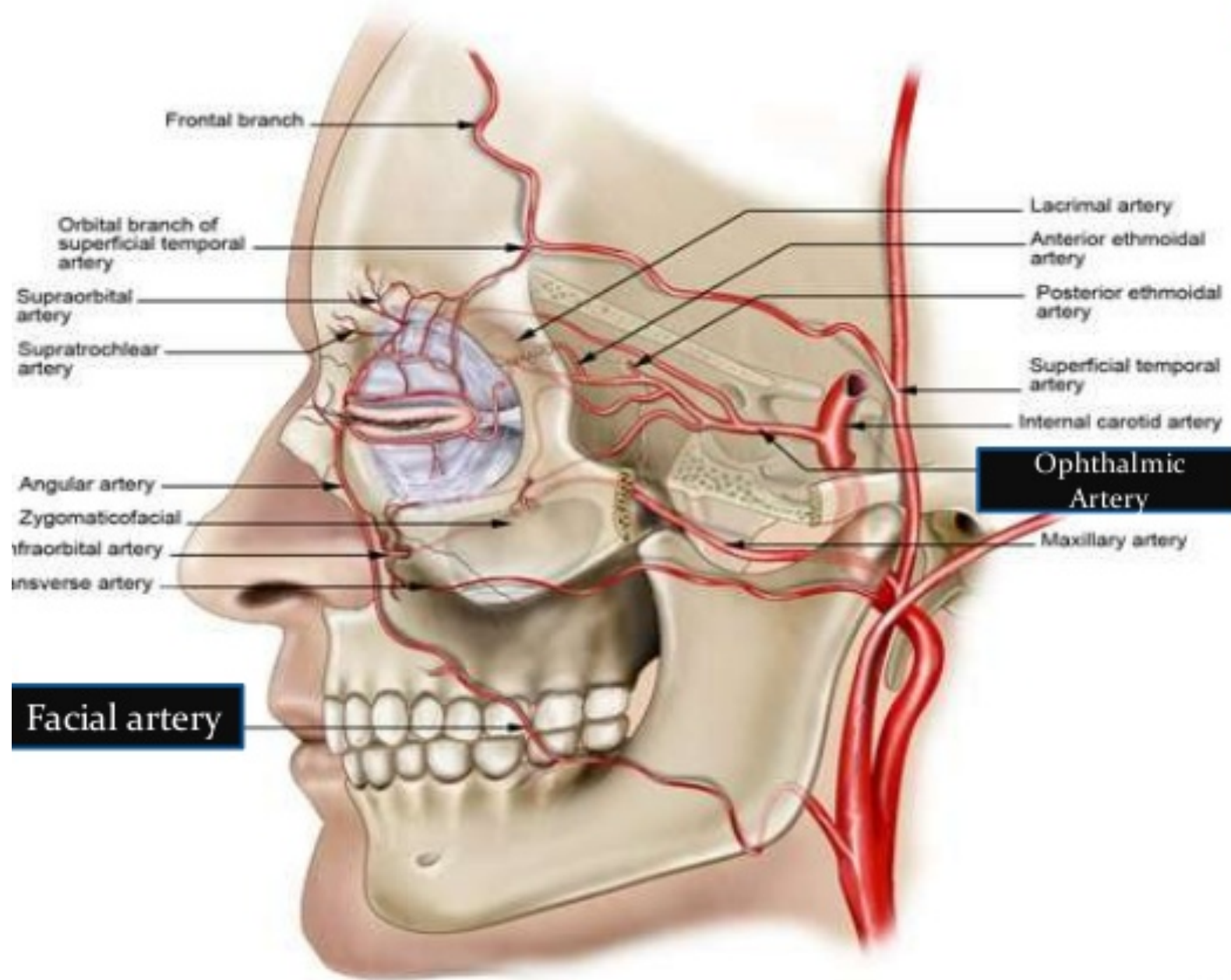
- Changes here contribute most significantly to age related changes in the midface.
- There is a predictable pattern of bony resorption



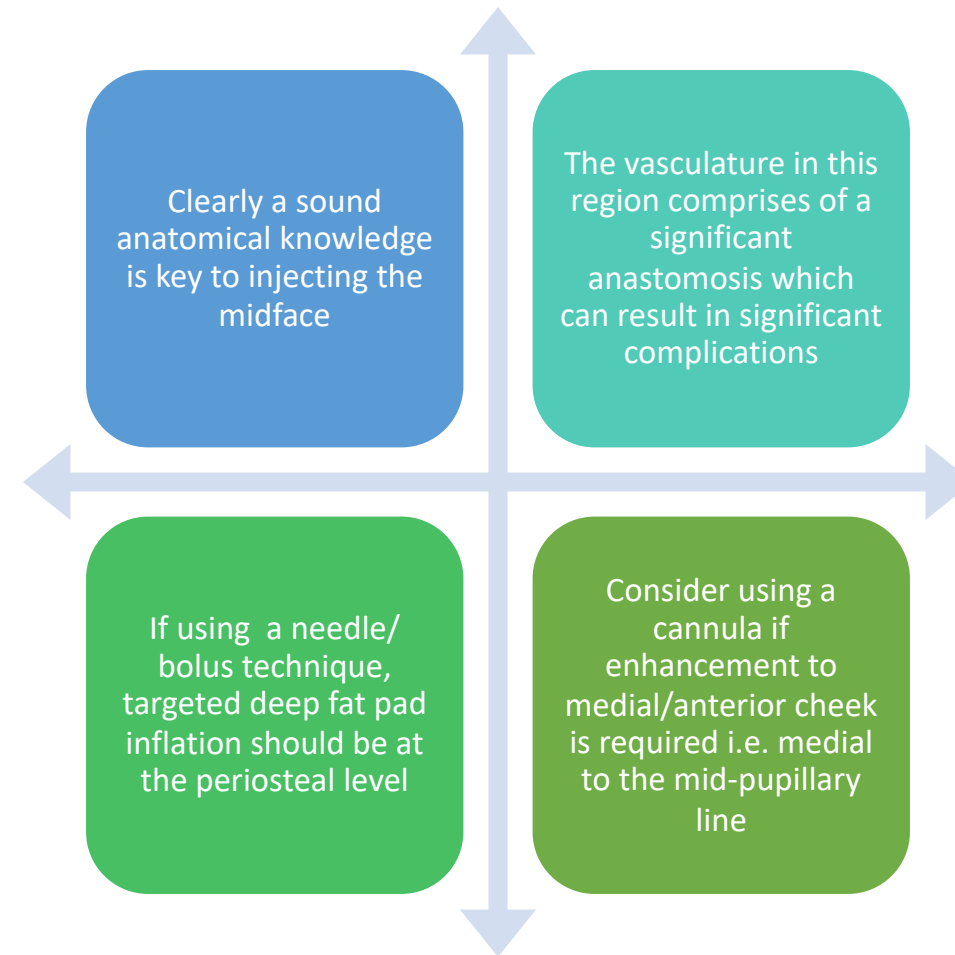
**Fig. 2** The areas of the facial skeleton that selectively resorb with

# Arteries of Midface

- Facial artery / angular artery
- Transverse Facial artery
- Infra-orbital artery



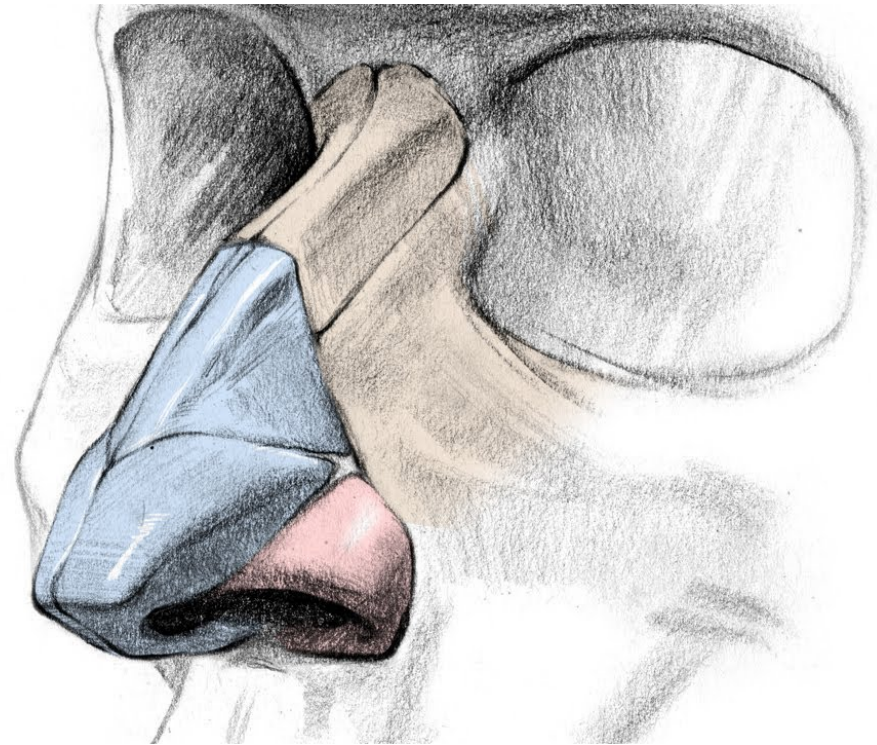
## Safe Injecting of the Midface



Safe  
Injecting of  
Midface



Nose



# Non-Surgical Rhinoplasty

Nasal contouring, reshaping, sculpting the nasal framework without surgery by using non permanent dermal filler

Very popular procedure

Satisfying for patient and injector

Cost effective with minimal downtime

Reversible

What can we  
do?

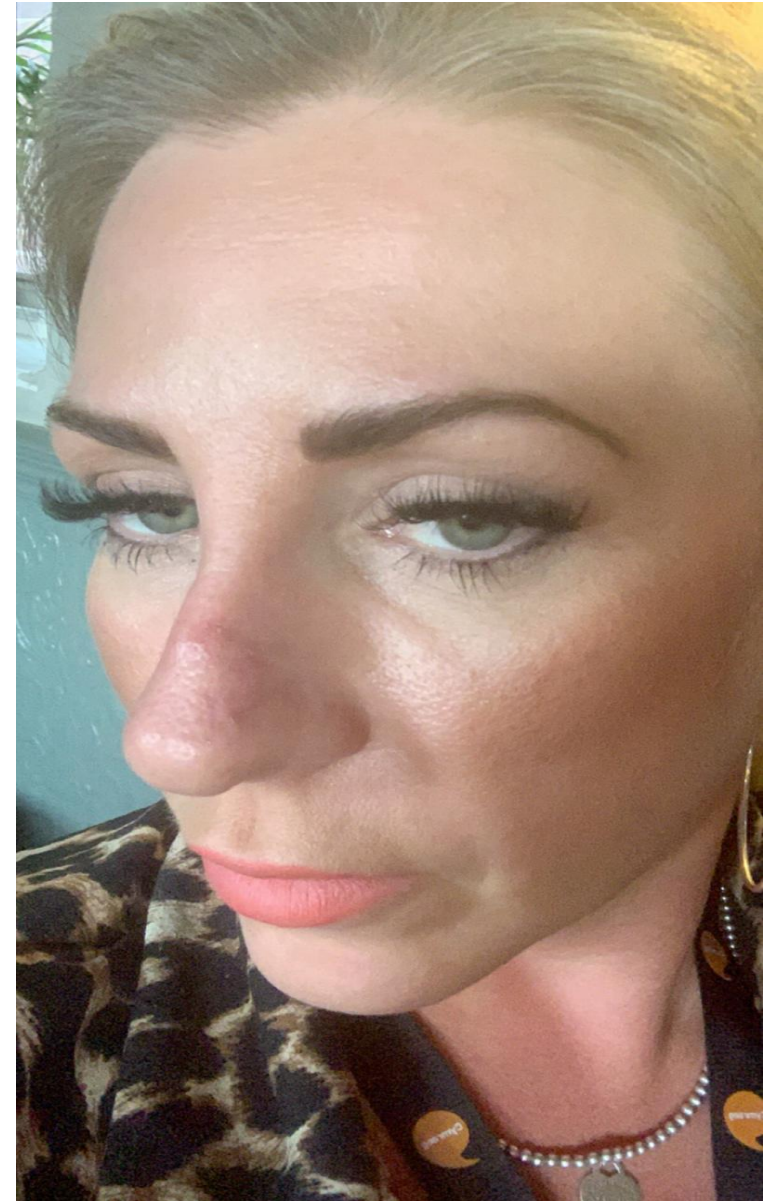
- Correct dorsal humps
- Project and elevate the tip
- Correct minor lateral deviation
- Open the naso-labial angle
- Project and slim the nose



Unfortunately

- Injection rhinoplasty can lead to significant complications
- Vascular occlusion and blindness
- To minimize these risks we need a thorough understanding of the anatomy of this highly vascular area

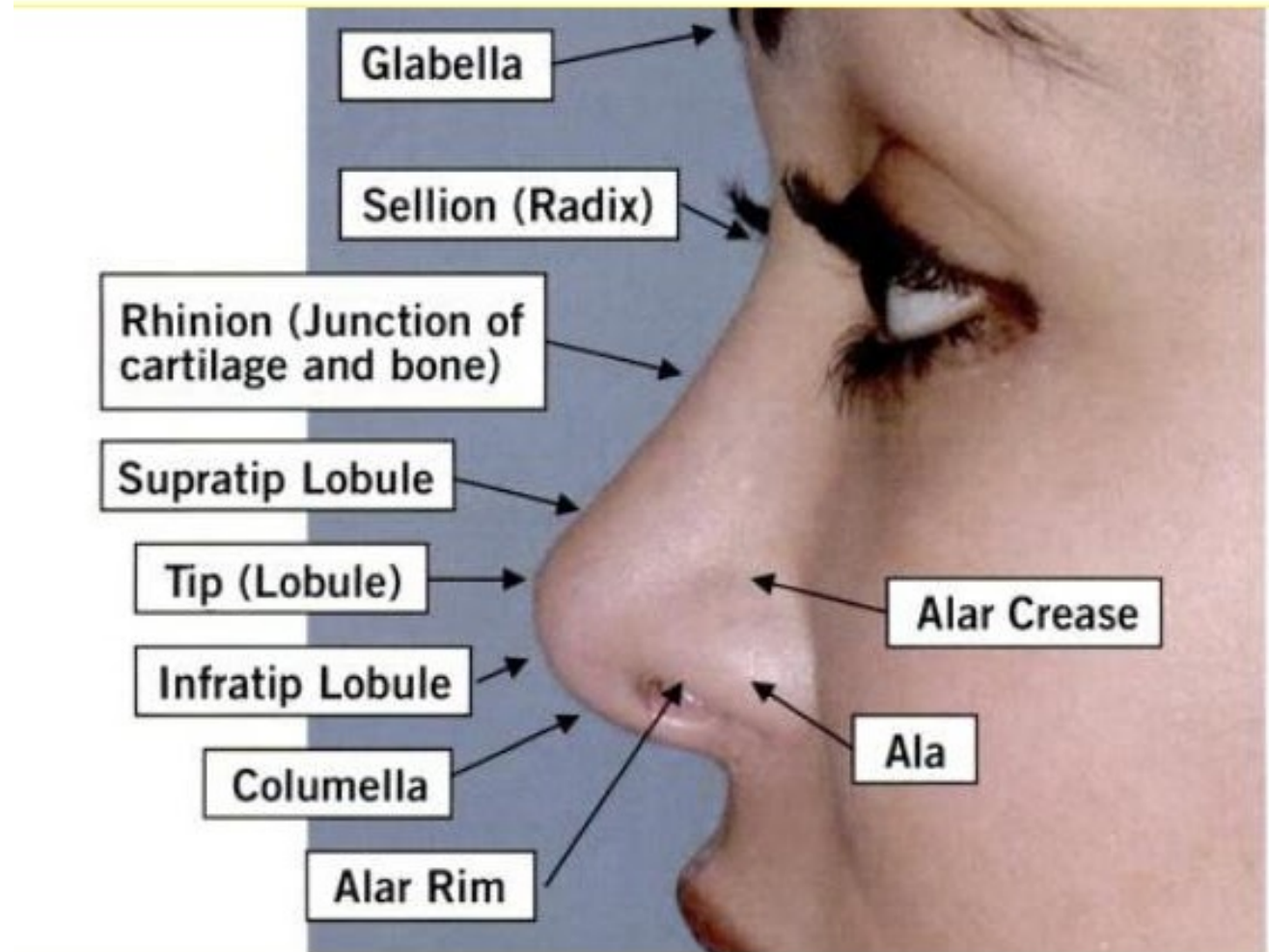
# Vascular occlusion



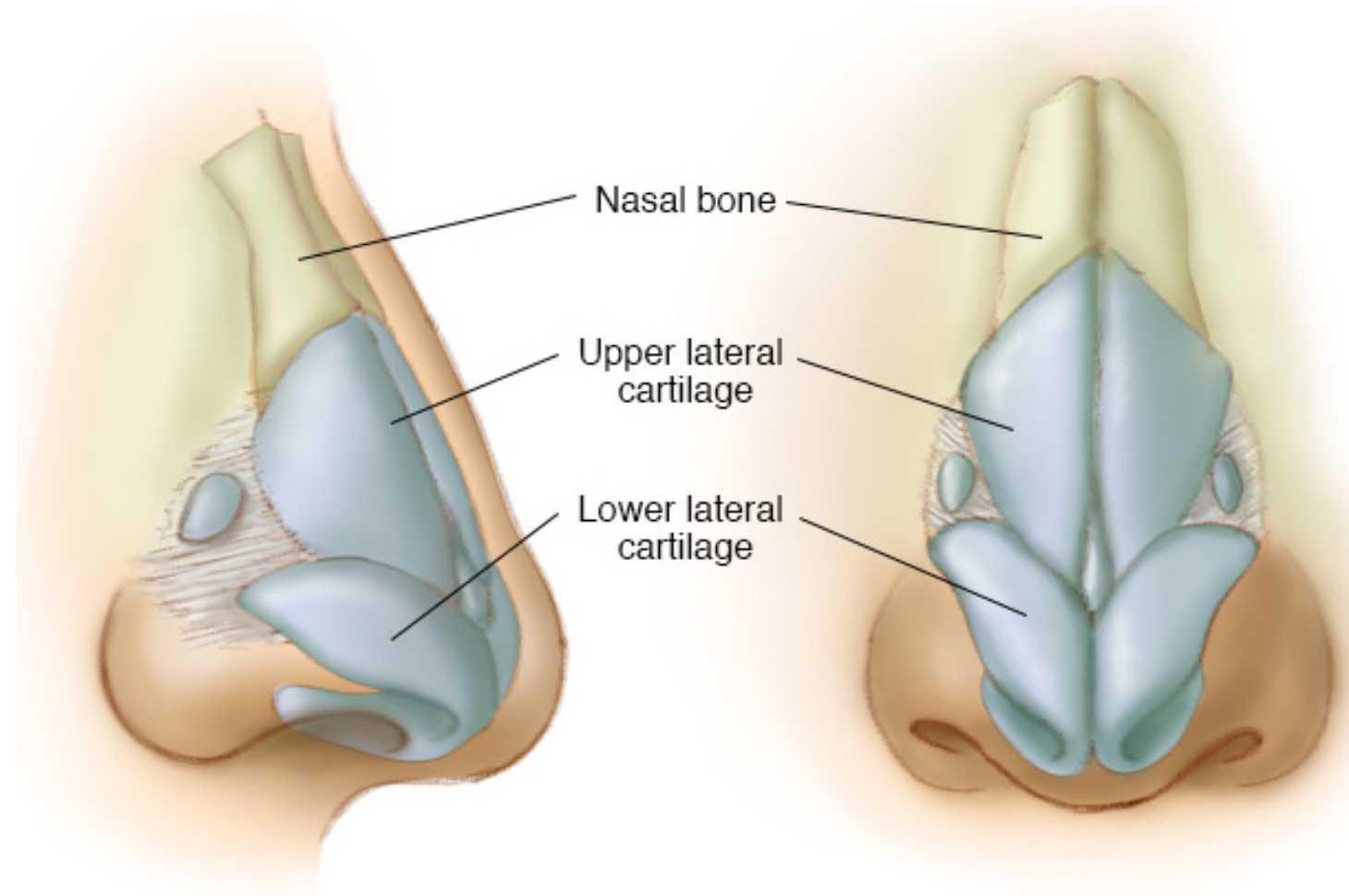
# Vascular Occlusion



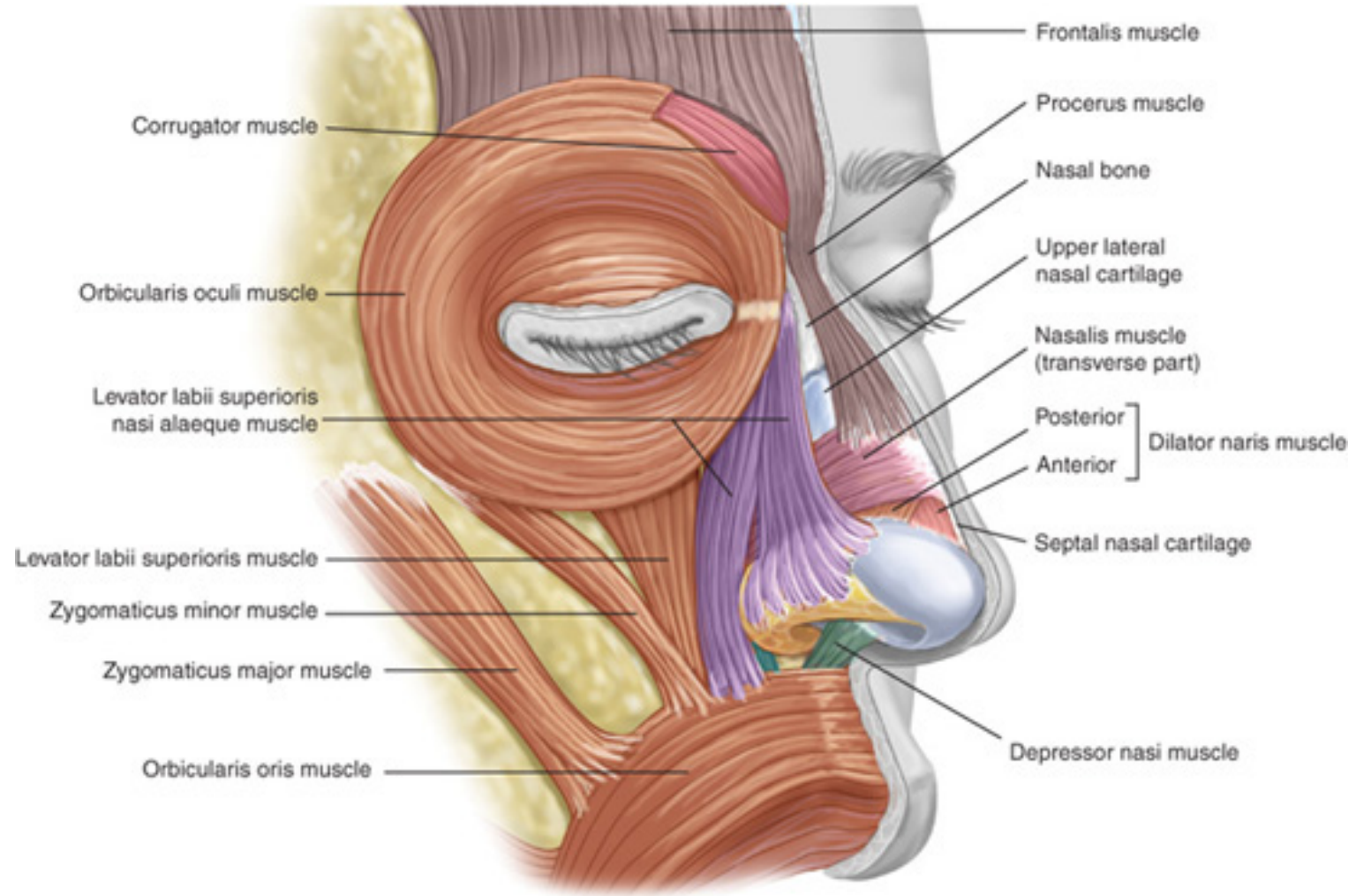
Surface  
Landmarks  
of the Nose



# Bone and Cartilage of Nose

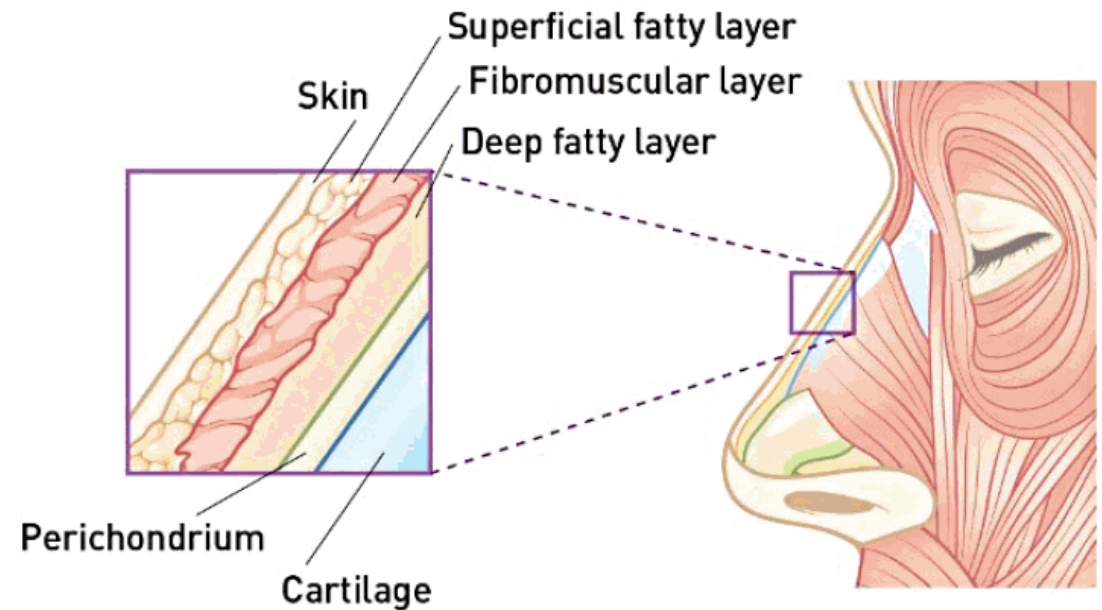
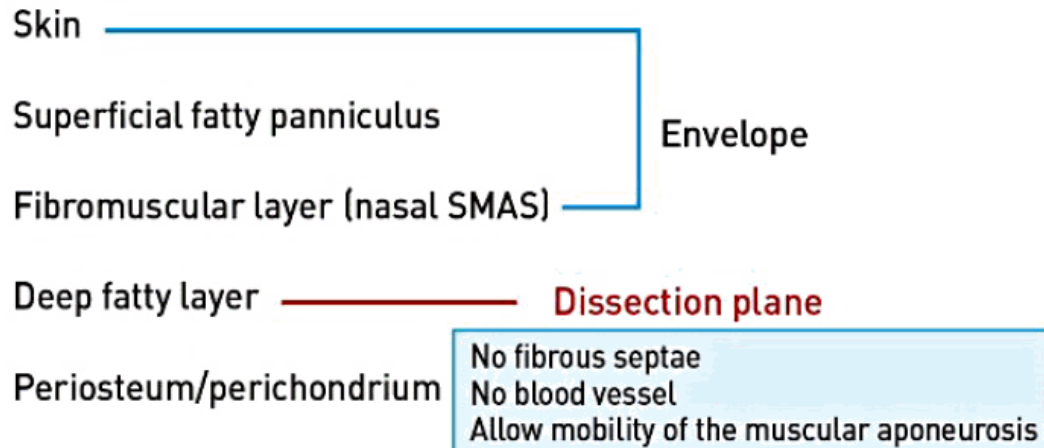


# Muscles of Nose



# Tissue Layers of Nose

## Anatomic layers of nasal envelope



# Blood Supply to Nose

Derived from both Internal and External carotid systems

Columella and lateral nasal artery are the major blood supply to the lower 2/3rds of nose derive from ECS

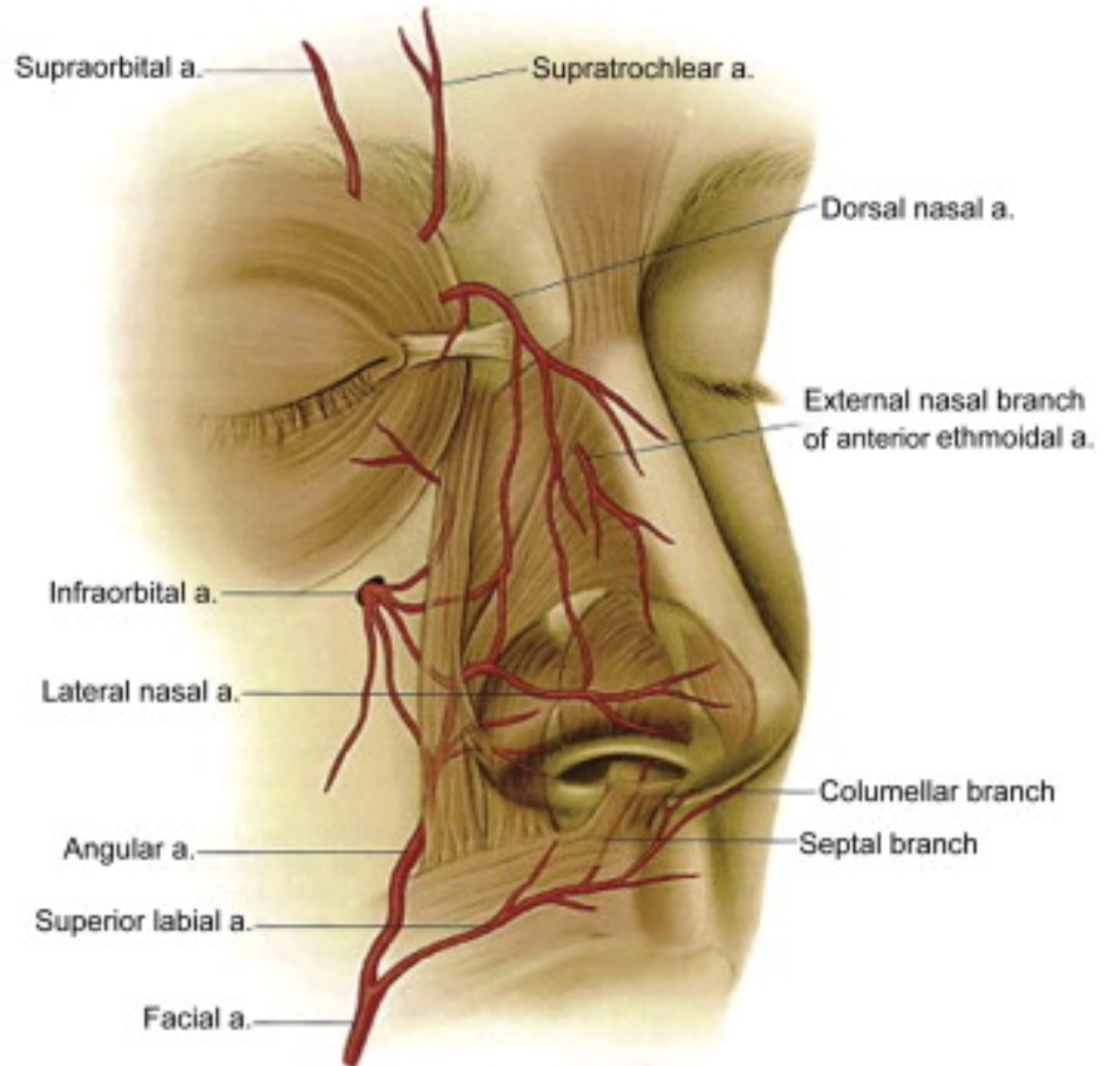
The dorsal nasal artery supplies the upper 1/2 of nose is derived from the ophthalmic artery which is a terminal branch of the ICS

There is significant anastomosis between the Internal and External systems

The blood vessels run on the upper surface of the fibromuscular layer on the nose



# Blood Supply to Nose



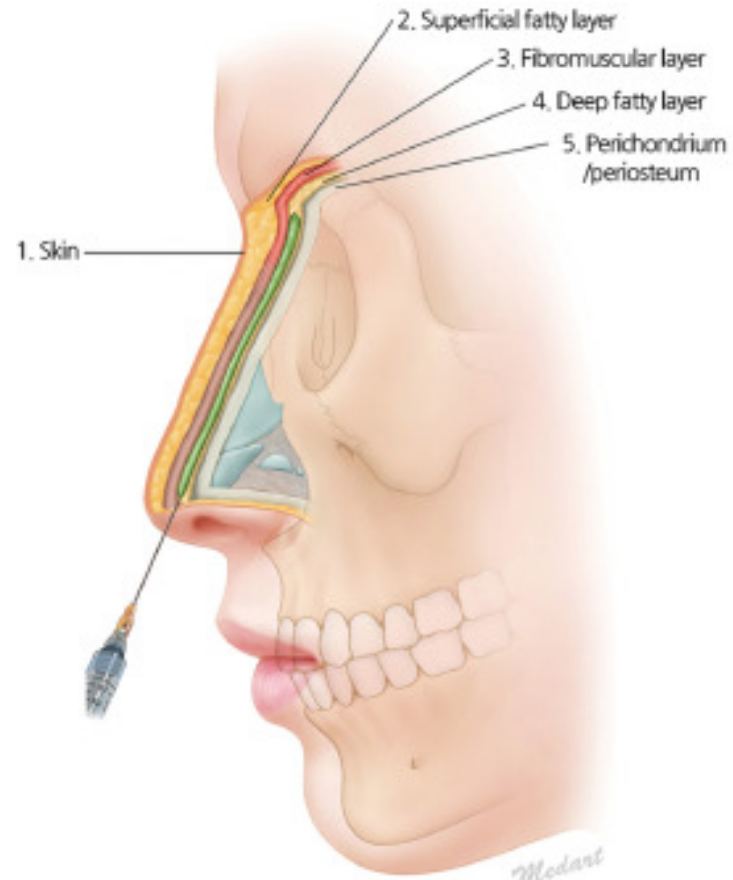
# Anatomical Considerations

- Over 100 cases of blindness linked to filler or fat injections to the glabella, forehead, nose and peri-orbital region
- Half of these are linked to fat injections
- Surprisingly 75% of these cases cannula was used
- Maybe using a cannula is not as safe as we thought
- Remember the tissue layers of the nose
- The plane of least resistance is just above or just below the fibromuscular layer. The blood vessels run on that fibromuscular plane

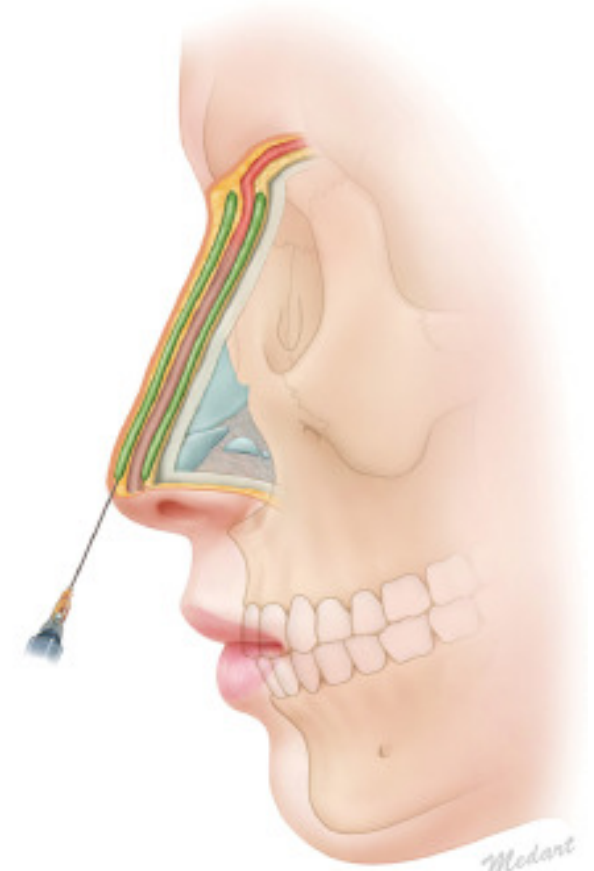
# Anatomical Considerations

- The nose is where the ICS and ECS meet
- Allowing misplaced filler to flow in a retrograde fashion into the orbit
- All the major blood vessels are paired symmetrically on either side of the nose resulting in a watershed in the midline
- Therefore it appears safest to deliver an injection of filler in the midline
- It might also be prudent to reconsider using a needle in the nose delivering the filler directly onto bone or cartilage below the vascular plane on the fibromuscular layer.
- Cannulae will glide in the path of least resistance i.e. Above or below the fibromuscular plane

Planes of  
least  
Resistance



**A**



**B**

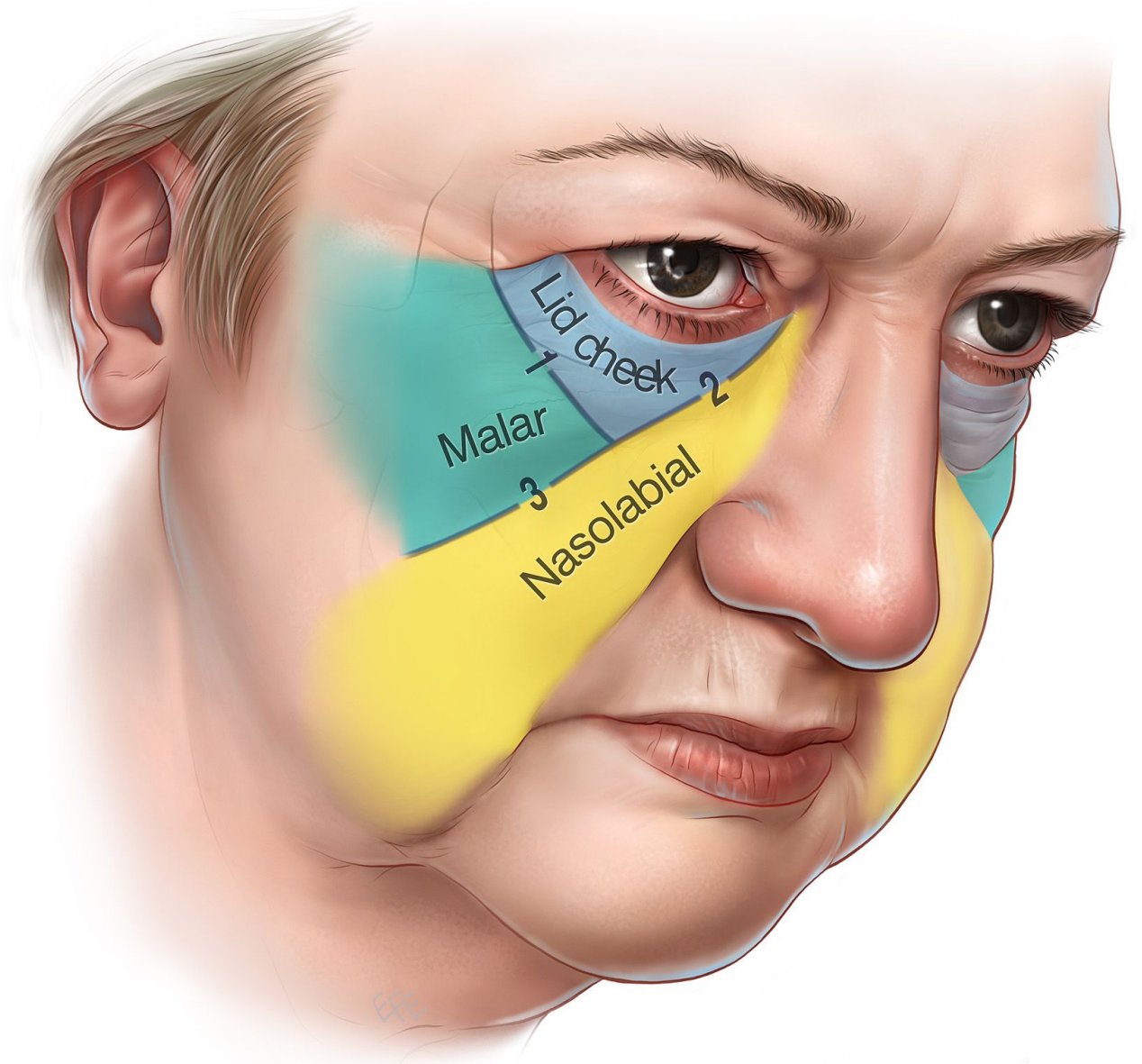
# Tips for Safe injecting

- Seat patient upright and have good lighting
- Use HA filler-you must be able to undo what you have done
- Use a medium/high G Prime filler
- Always have Hyalase ready
- If using a needle use a 30g needle and make contact with the bone
- Consider aspiration and use small aliquots
- Consider the anatomical structure and plane of injecting
- If using a cannula try and ensure the cannula tip stays on the cartilage or bone
- Stay in the midline



# Nasolabial Region

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# Nasolabial Region

This is an area which is most commonly treated with HA filler

Also an area that is usually taught at beginner level

This might imply that this is a safe area to treat

However this is clearly NOT the case given the incidence of alar, lip necrosis and blindness associated with treatment here.

The main reason for this is the close proximity of the Facial Artery

## Anatomical Considerations

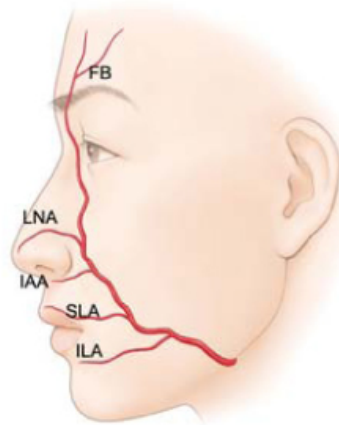
- The nasolabial fold originates from the ala of the nose and heads infero-laterally to the modiolus lateral to the corner of the mouth
- Probably multifactorial origin
- Musculo-dermal insertions of the lip and mouth elevators
- Dense fibrous attachments pulling the fold in and hypertrophy and ptosis of the overlying fat
- Bony resorption reducing support in the area



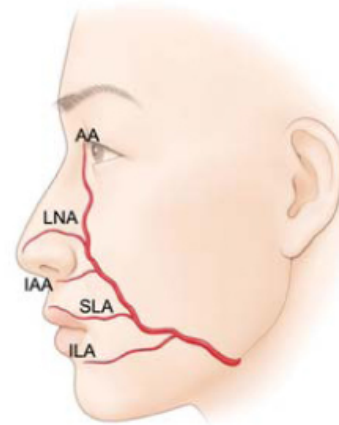
# Anatomical Considerations

- The Facial Artery is a branch of the External Carotid Artery
- Winds itself around the mandible about 1 cm in front of the anterior border of masseter
- From there it winds a tortuous route running between 8-18 mm lateral to the oral commissure
- Then ascending to run 3.2mm +/- 4.5mm lateral to the alar triangle
- At the level of the mandibular edge the artery is on bone
- As it ascends it become progressively more superficial lying some above and sometime below the muscle in the alar area
- All this implies an increasing level of variability the higher you go

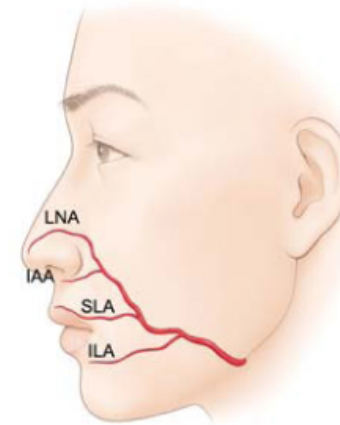
# Variability of the Facial Artery



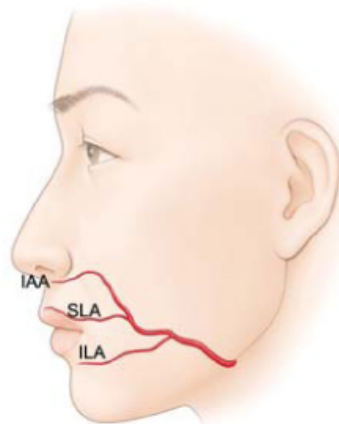
FOREHEAD 4.4%



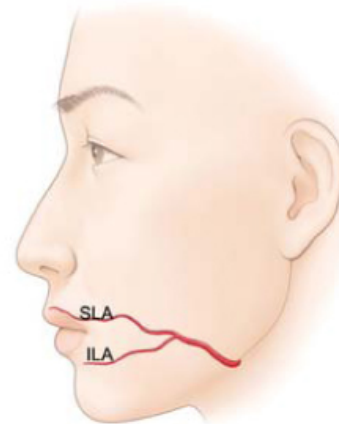
ANGULAR 36.3%



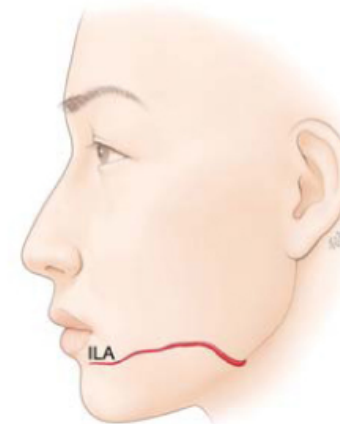
NASAL 44.0%



ALAR 3.3%



SUP LABIAL 6.6%



INF LABIAL 5.5%

# Anatomical Considerations

- This variability is worrying and difficult to predict
- What is more predicable is the DEPTH of the artery in certain anatomical areas
- As the Facial Artery emerges onto the face it is deep on the bone
- As it ascends it traverses deep to DAO and the zygomaticus muscles
- As it ascends further in most cases it emerges superficial to the lip elevators

# Safe Injecting Tips

- Don't treat. Consider volume replacement higher up the face
- Consider using a cannula. Easy technique to master
- If using a needle consider injecting perpendicular to the fold
- If using a needle consider aspiration
- Inject slowly with low pressure and watch the skin
- When injecting in the alar triangle either injection deep down on the bone ( maxilla ) or alternatively superficial



Thank You