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From Theory to Technical Excellence: Cannula Injection in the Lip and Face

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FACULTY INFORMATION

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Dr. Bloom has disclosed that he is a consultant for Allergan, Galderma, Merz, Revance Therapeutics, ThermiAesthetics, InMode, Sinclair Pharmaceuticals, Alma Lasers, Remedly, Aqua Pharmaceuticals, Cearna, MEND, and Prollenium.

LEARNING OBJECTIVES

- Describe the rationale for selecting a blunt cannula for filler injection
- Describe advanced techniques for cannula injection to optimize outcomes while minimizing adverse events

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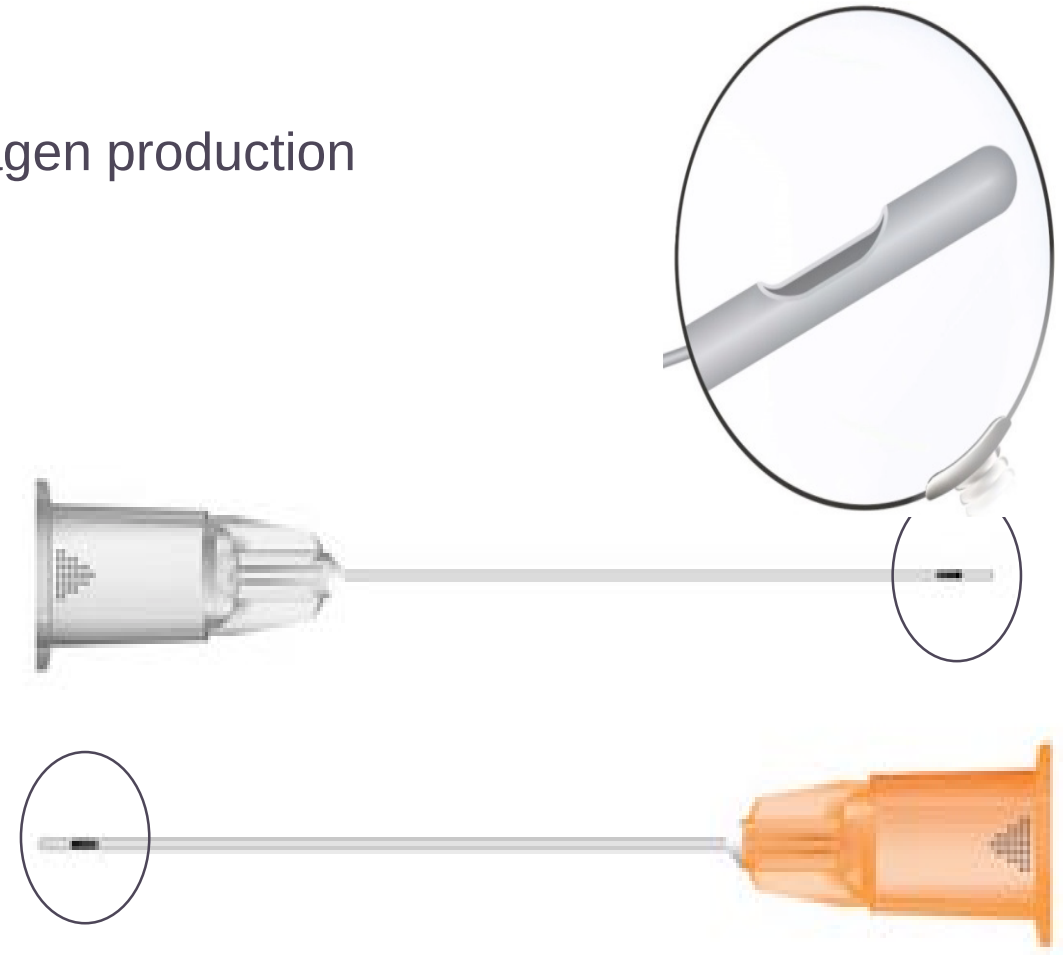
The Rationale for Blunt Cannula

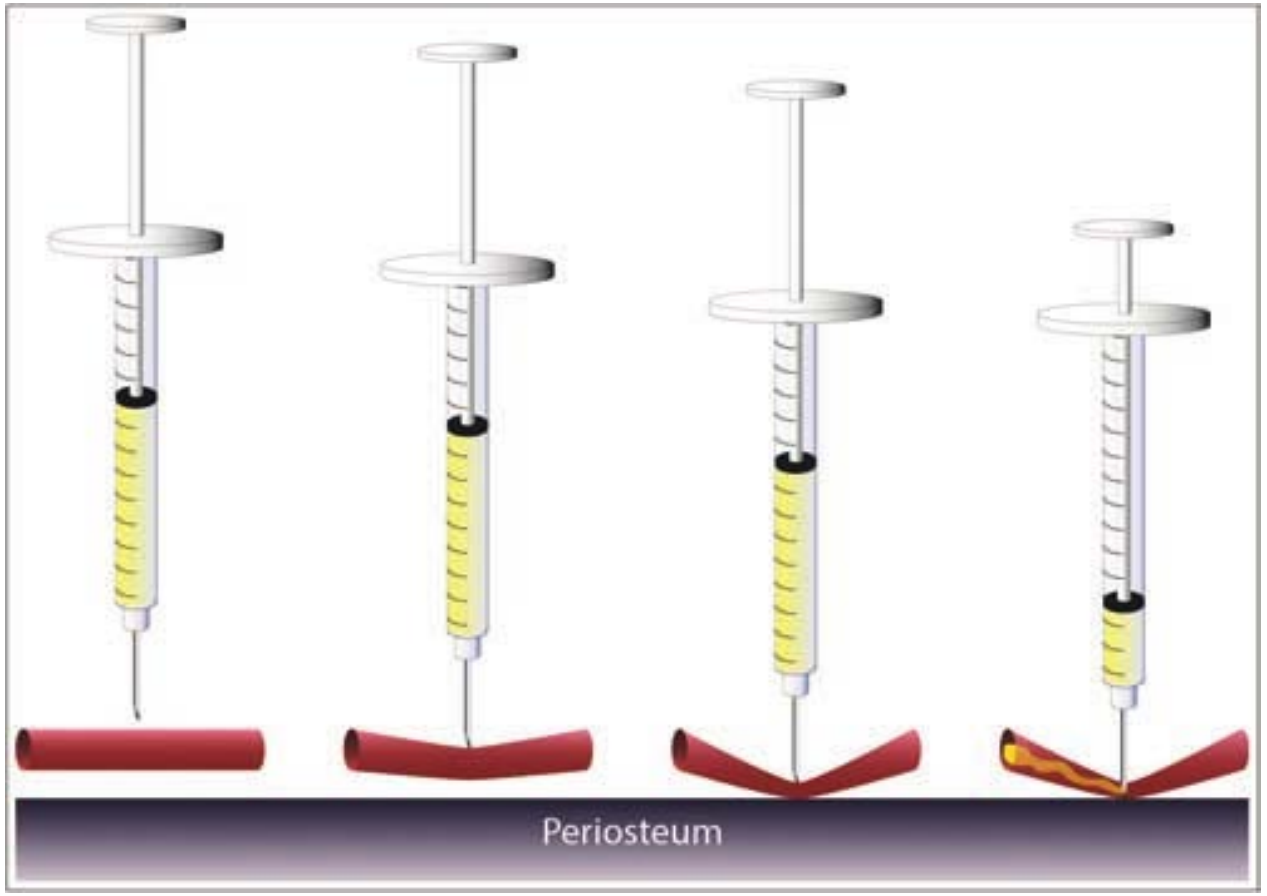
POTENTIAL ADVANTAGES OF CANNULA INJECTION

- Single point of entry for broader coverage
- Mechanical action on fibroblasts stimulates new collagen production
- Virtually no bruising
- Less pain
- Minimal downtime
- Less chance of intravascular injection reduces risk of
  - Vascular occlusion/necrosis
  - Filler embolization
  - Blindness



Chiu A, et al. Lip injection techniques using small-particle hyaluronic acid dermal filler. *J Drugs Dermatol*. 2016;15(9):1076-1082.

RISK FOR INTRA-ARTERIAL INJECTION WITH SHARP NEEDLE



Van Loghem JAJ, et al. *Aesthet Surg J*. 2017;38(1):73-88.

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Clinical Trial Data in Favor of Blunt Cannula for Filler Injections

THE IMPRECISION OF SHARP NEEDLE INJECTION?

- Cadaver study: With sharp needle technique, filler was found in supra-periosteal layer as expected, but also in subdermis and dermis

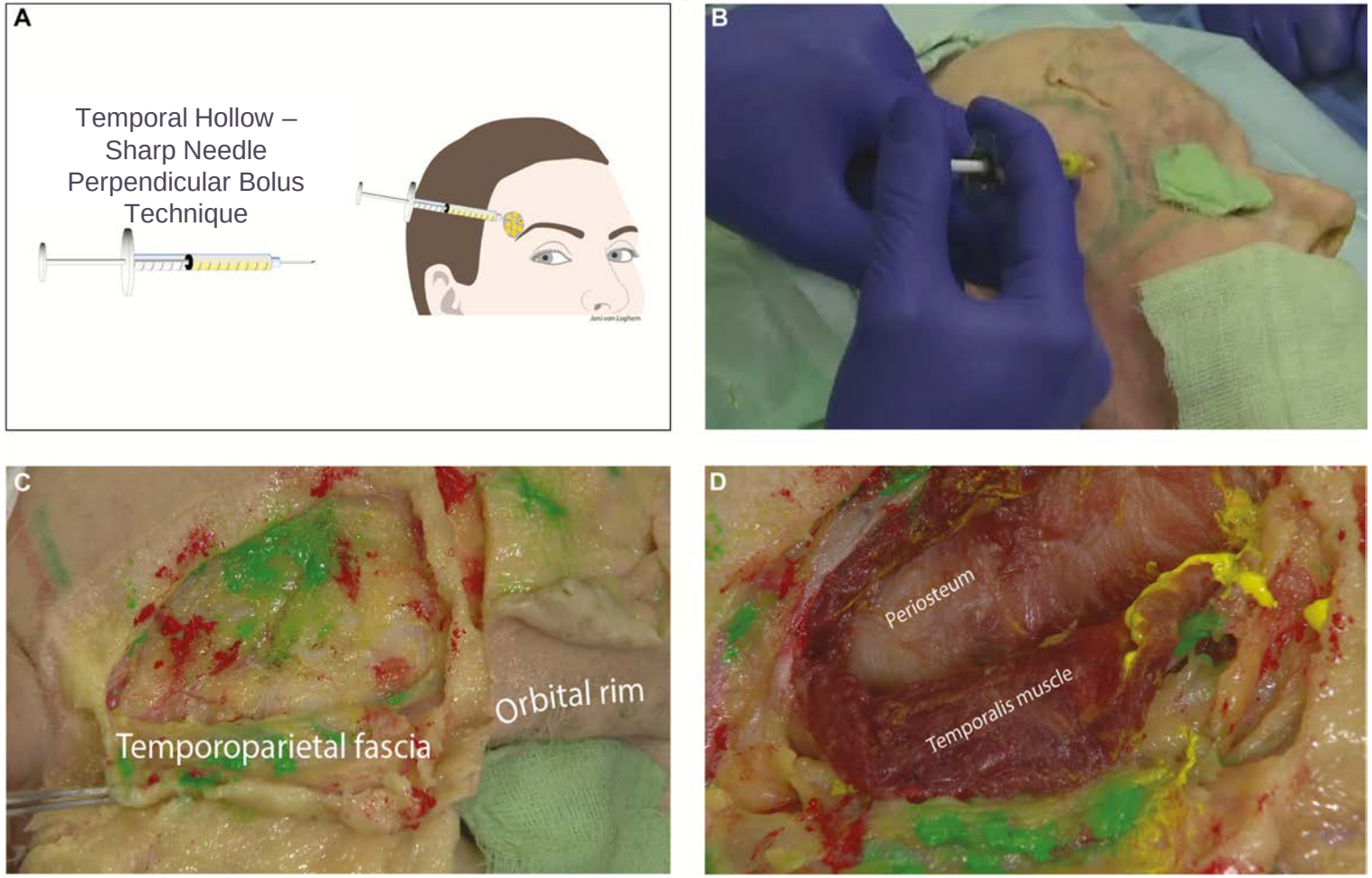
Possible Factors Influencing Spread in Tissue Layers

TECHNIQUE SPECIFICS	PRODUCT PROPERTIES

• Angled approach vs perpendicular approach
  o Needle and cannula trajectories represent possible paths of least resistance
  o When the path of least resistance traverses multiple anatomical layers, the chance of backflow to these layers increases
• Lumen of needle may influence backflow
• Applied pressure to the syringe might influence backflow positively
	• Rheologic properties influence the amount of spread in the tissue
	  o Viscosity
	  o Elasticity
	  o Cohesivity
	• Other product-related factors
	  o Particle size
	  o Concentration of HA/hydration
	  o Crosslinking
	  o Temperature

Van Loghem JAJ, et al. *Aesthet Surg J*. 2017;38(1):73-88.

TEMPORAL HOLLOW INJECTION –
SHARP NEEDLE RESULTS IN UNEVEN DISTRIBUTION IN MULTIPLE LEVELS



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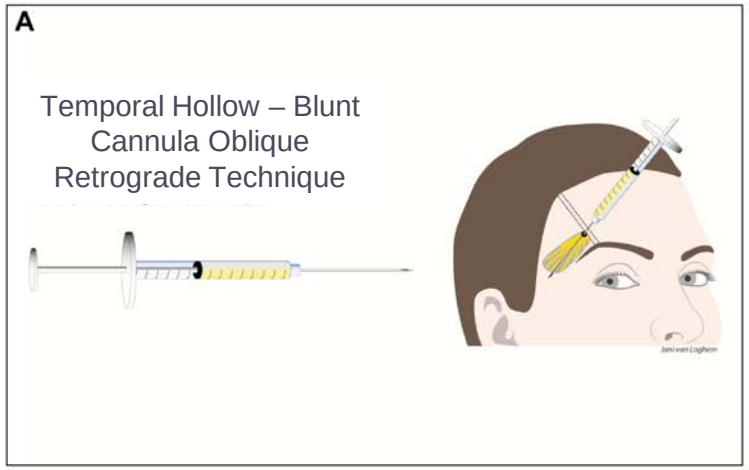
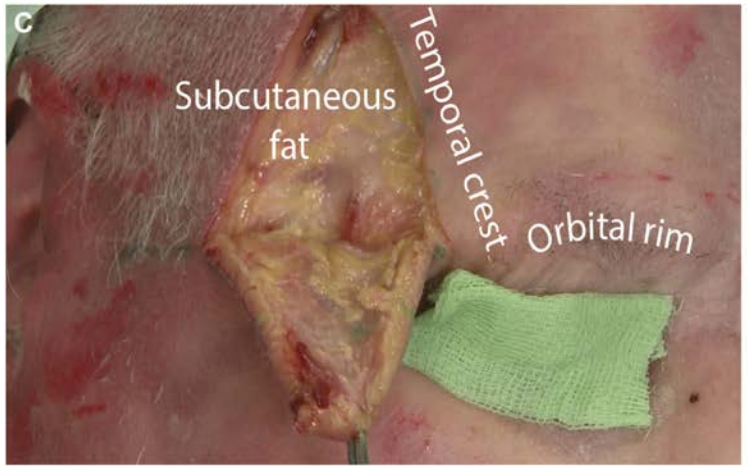
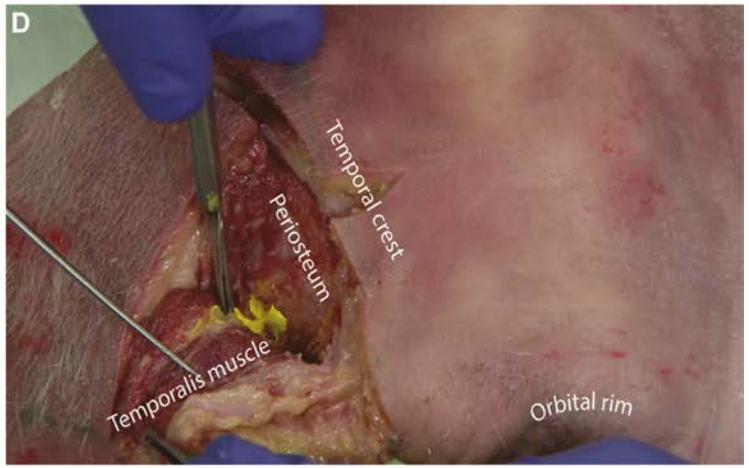
TEMPORAL HOLLOW INJECTION –
BLUNT-TIP CANNULA RESULTS IN EVEN DISTRIBUTION IN THE TARGET LAYER

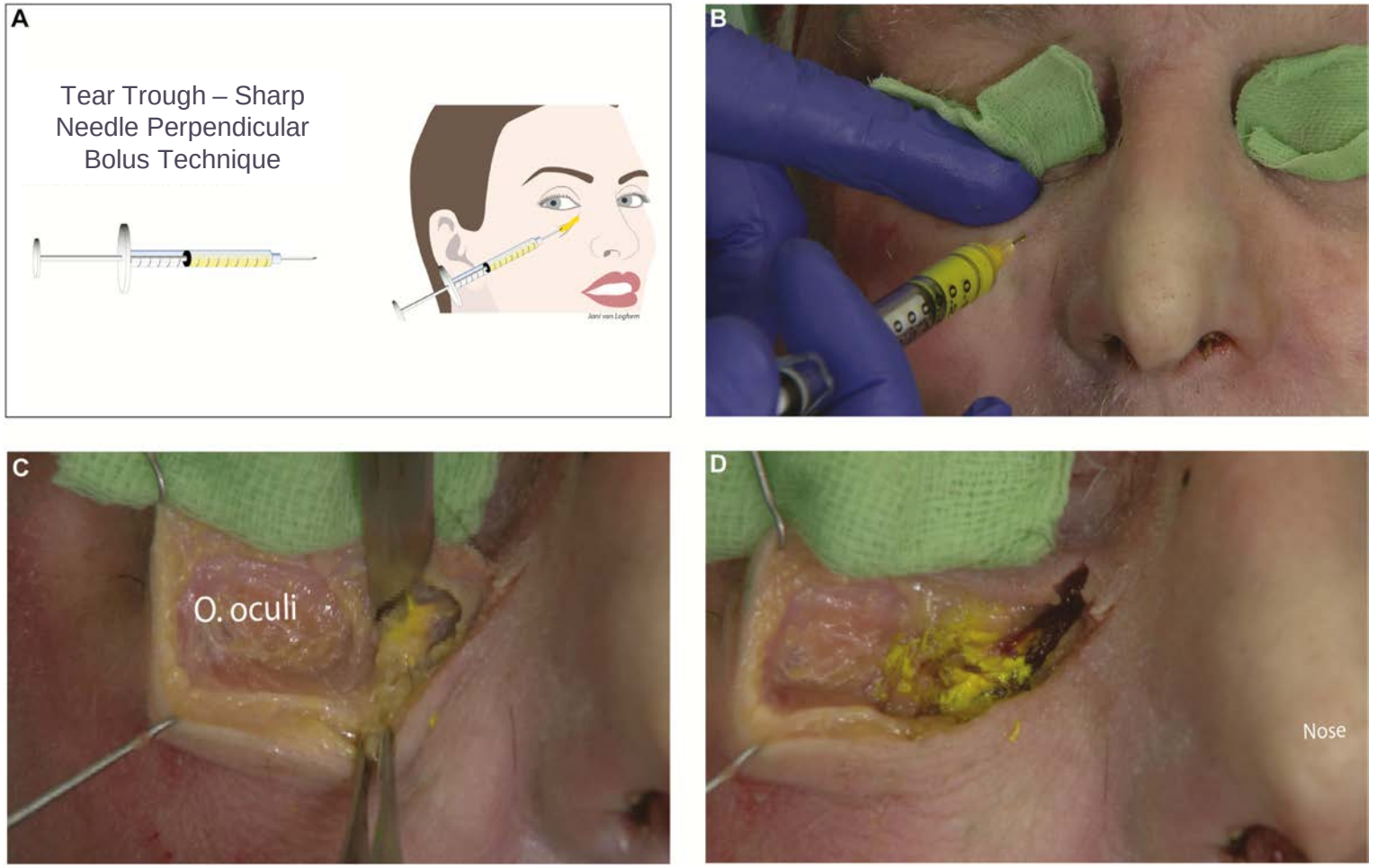






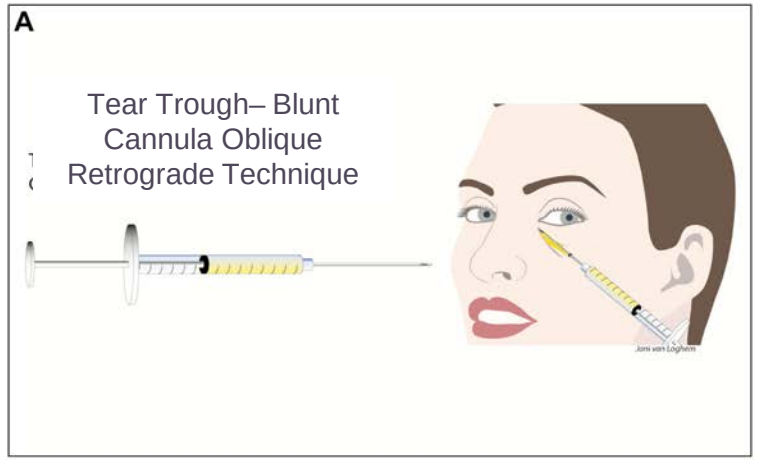
Van Loghem JAJ, et al. *Aesthet Surg J*. 2017;38(1):73-88.

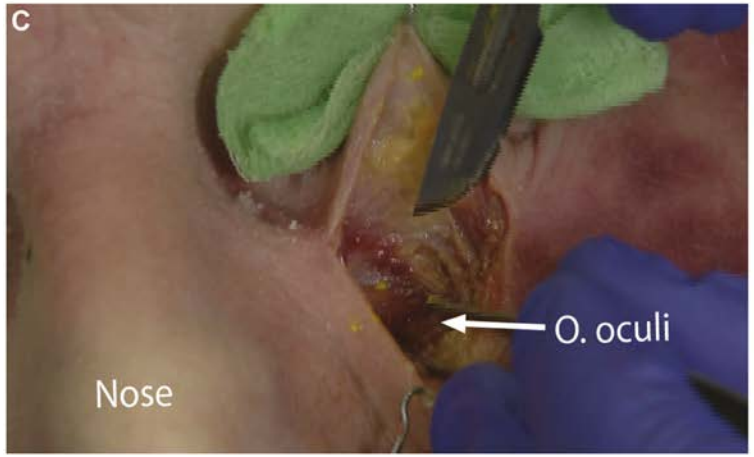
TEAR TROUGH INJECTION –
SHARP NEEDLE RESULTS IN UNEVEN DISTRIBUTION IN MULTIPLE LAYERS

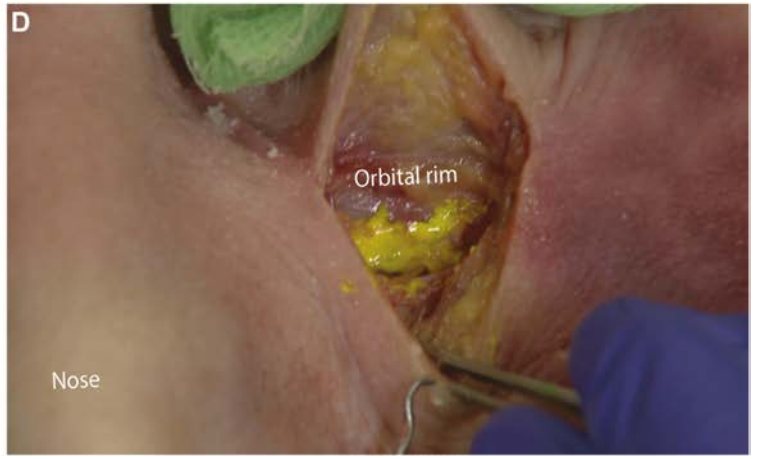


Van Loghem JAJ, et al. *Aesthet Surg J*. 2017;38(1):73-88.

TEAR TROUGH INJECTION – BLUNT-TIP CANNULA RESULTS IN EVEN DISTRIBUTION IN THE TARGET LAYER







Van Loghem JAJ, et al. *Aesthet Surg J*. 2017;38(1):73-88.

THE CANNULA ENTAILS AN INITIAL ANGLED DESCENT FOLLOWED BY MORE HORIZONTAL ADVANCEMENT OF THE CANNULA AT DEPTH

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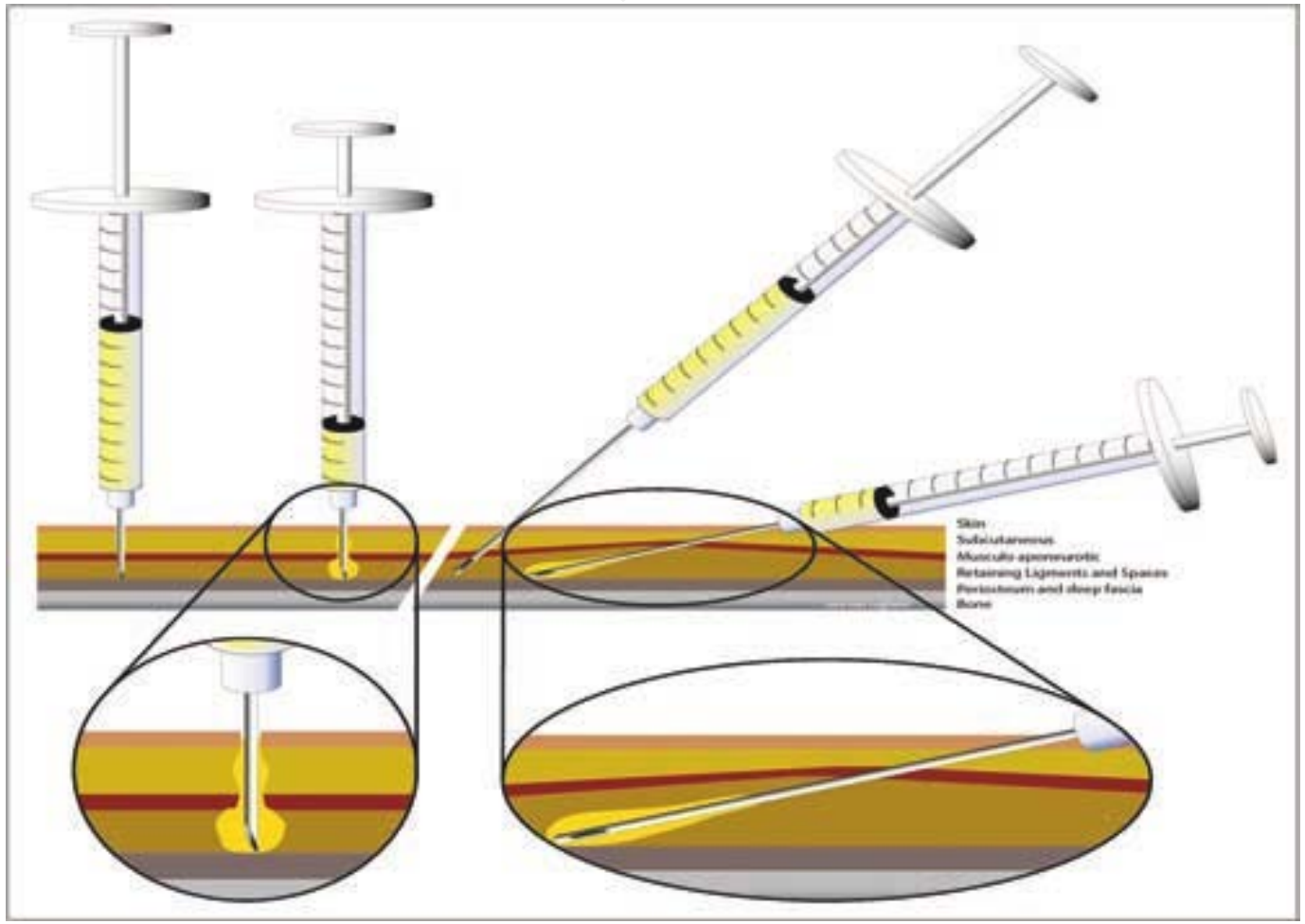

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BLUNT-TIP MICROCANNULA = LESS BRUISING/HEMATOMAS AND PAIN, WITH FASTER RECOVERY VS SHARP NEEDLE

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- 95 patients aged 30 to 76 years (facial, décolleté, and hand augmentation)
- Topical anesthesia peel-off mask of lidocaine/tetracaine
- Cross-linked HA (20 mg to 28 mg per mL) injected into the mid-dermis
  - Microcannula or needle inserted in entire length of the fold, depression, or lip
  - Filler injected in a linear retrograde fashion with variable volume
- Overall GAIS (no significant differences microcannula vs. hypodermic needle)
  - 1 month: excellent (55%), moderate (35%), somewhat improved (10%)
  - 6 months: excellent (23%), moderate (44%), somewhat improved (33%)
- Adverse events
  - Visual Analog Scale for Pain during the injections: 3 (mild) for microcannula vs 6 (moderate) for hypodermic needle
  - Bruising and ecchymosis were more marked with hypodermic needle

GAIS = Global Aesthetic Improvement Scale

Fulton J, et al. *J Drugs Dermatol*. 2012;11(9):1098-1103.

SAFETY AND EFFICACY OF CANNULA INJECTION

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SPHAL for Lip Augmentation:

- Multi-center, open-label, prospective study
- 60 subjects
- Mean total volume (ie, both lips and optional perioral rhytids) of 2.2 mL
- Clinically significant improvement at week 12
  - GAIS for both lips
    - Investigator-reported: 98.0%
    - Subject-reported: 84.3%
  - MLFS (investigator-reported): 96.1%

GAIS = Global Aesthetic Improvement Scale; MLFS = Medicis Lip Fullness Scale; SPHAL = Small-Particle Hyaluronic Acid Plus Lidocaine

Chopra R, et al. *J Drugs Dermatol.* 2018;17(1):10-16.

TREATMENT-EMERGENT ADVERSE EVENTS (TEAE)

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Injection Site Bruising		
Mild	5 Events	4 Subjects (6.7%)
Moderate	0 Events	0 Subjects
Total	5 Events	4 Subjects (6.7%)

Injection Site Swelling		
Mild	10 Events	6 Subjects (10%)
Moderate	4 Events	2 Subjects (3.3%)
Total	14 Events	8 Subjects (13.3%)

- No TEAEs for 81.7% subjects; No “severe” related TEAEs reported
- Lip safety lip assessments were reported as normal at all study points, with exception of 1 report of abnormal texture that returned to normal by week 4

Injection Site Pain		
Mild	2 Events	1 Subjects (1.7%)
Moderate	0 Events	0 Subjects
Total	2 Events	1 Subjects (1.7%)

Any Related TEAEs		
Mild	17 Events	9 Subjects (15%)
Moderate	4 Events	2 Subjects (3.3%)
Total	21 Events	9 Subjects (15%)

Chopra R, et al. *J Drugs Dermatol*. 2018;17(1):10-16

OPTIMAL TECHNIQUES FOR PRECISION CANNULA INJECTIONS

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1. Injection principles
2. Choosing the right cannula
3. Minimizing adverse events

CANNULA INJECTION PRINCIPLES

- Obtain the best possible results with optimal safety
  - Treat each area at the appropriate depth of injection (not too superficial)
    - Based largely on a knowledge of the facial anatomy
  - Use the appropriate filler for each site and expected results based on product rheology & characteristics (eg, viscosity, G', HA concentration, etc.)
- Select the correct cannula size for the product and the area to be injected
  - Delicate areas (lips, tear troughs) require thinner cannulas vs areas of thicker tissue need a more robust cannula (midface, temples)
  - The cannula pilot hole should always be one size or gauge larger than the cannula being used

SELECTING THE RIGHT CANNULA SIZE

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For low concentration and viscosity HA fillers, superficial injections

30G x 1" (25mm):
tear trough, fine lines - precise work

For fillers of medium concentration and viscosity HA fillers

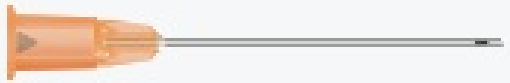
27G x 1" (25mm):
precise work

27G x 1 ½" (38mm):
most versatile size, used for most facial indications

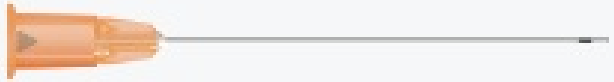
27G x 2" (50mm):
extra length to cover larger treatment area

SELECTING THE RIGHT CANNULA SIZE

For medium to thick HA and non HA fillers, median to deep injections

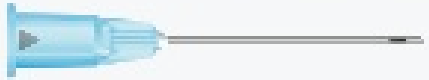


25G x 1½" (38mm)
can be used for most facial indications

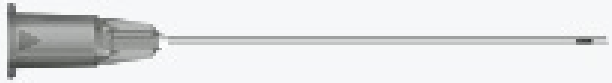


25G x 2" (50mm):
extra length to cover larger treatment area

For viscous & highly concentrated fillers, injections deep into the skin to create volume



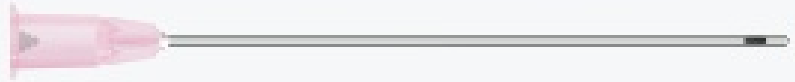
23G x 1⅛" (29mm)
precision for thick fillers



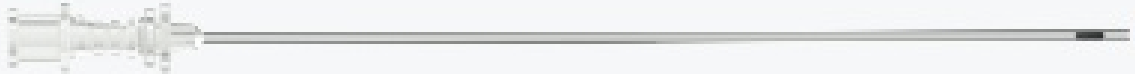
22G x 2" (50mm)
most versatile size for thick fillers

22G x 2¾" (70mm)
perfect for the hands

For facial fat graft (not recommended for fillers)



18G x 2¾" (70mm)



16G x 4" (100mm)

MINIMIZING THE RISK OF ADVERSE EVENTS WITH CANNULAS

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- Adverse events are rare
  - Risk of blindness and necrosis are rare, but firm knowledge of the vascular anatomy is key prevention and management
- Aspirate before injecting
- Inject slowly with the least amount of pressure possible
- Move tip with delivery of product
- Incrementally inject 0.1 to 0.2 mL of product
- Use small syringe to deliver precise aliquots
- Use small gauge needle (cannula) to slow injection speed
- When indicated, use blunt microcannulas
- Stop injecting if resistance is encountered or if patient experiences pain/discomfort
- Always monitor the patient during and post-injection

1. Signorini M, et al; Global Aesthetics Consensus Group. *Plast. Reconstr Surg.* 2016;137:961e. 2. Beleznay K, et al. *Dermatol Surg*. 2015;41:1097–1117.