Injectable fillers: what to choose?

**Injectable fillers**

**Thin Wrinkles around Eyes**
Small particle hyaluronic acid such as Juvederm Volbella or Restylane silk dermal fillers is the choice. Do not use large particle HAs such as Perlane, Calcium hydroxyapatite, or Poly-L-lactic acid.

**Thick Wrinkles like Nasolabial Fold, Frown Line & Marionette Line**
If you prefer completely degradable, easily removable filler, large particle hyaluronic acid (Perlane) is the choice even if its effect lasts only for 6 to 9 months. If you prefer completely degradable filler, Calcium hydroxyapatite (Radiesse) is the choice even if it is not easy to remove until it is degraded spontaneously. If you prefer longest acting filler, bio collagen stimulators like Sculptra is the choice although it takes longer to see results.

**Forehead Wrinkles**
My filler of choice for these types of lines is Juvederm ultra, but Restylane Silk and Belotero also do a fine job in this anatomical area.

**Augmentation of Lips**
If you prefer completely degradable filler in spite of short action, large particle HA Restylane is the choice. If you
Fillers:

- DROOPY EYEBROWS
- HOLLOW TEMPLES
- LOSS OF VOLUME IN CHEEKS
- UNDEFINED JAWLINE
- MARIONETTE LINES
- THIN LIPS
- CHIN WRINKLES
- LAUGH LINES
- UNDEFINED NOSE OR TIP
- LIPSTICK LINES
- SAGGING CORNERS
- EAR LOBE CORRECTION
- CREASES BETWEEN BROWS
- HOLLOWNESS UNDER EYES
Hyaluronic acid
Hyaluronic Acid (HA) Must Be Cross-linked Before Use as a Dermal Filler

HA is a naturally occurring linear polysaccharide that is a natural component of the skin.\(^2\)

Unmodified HA has a short half-life (~24 hours).\(^2\)

**THEREFORE:**

HA must be cross-linked to prevent rapid post-injection clearance.\(^3\)

BDDE is a common cross-linking agent utilized by JUVÉDERM\(^®\), Restylane\(^®\), and BELOTERO BALANCE\(^®\).\(^2\)

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Different ways of HA manufacturing

**Homogenized gel**

Different-sized particles create a uniform blend.

Resulting in a smooth-consistency gel\(^{1,2,*}\).

**Sieved gel**

Sieving creates many small particles\(^{1,2}\).

Resulting in a granular-consistency gel\(^{1,2,*}\).

*References:*

# Currently Marketed HA Fillers

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>HA Conc., mg/mL</th>
<th>Type</th>
<th>Lidocaine</th>
<th>Needle Size, G</th>
<th>US FDA Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belotero Balance</td>
<td>22.5</td>
<td>Cohesive Poly-densified Matrix HA</td>
<td>No</td>
<td>27 or 30</td>
<td>2011</td>
</tr>
<tr>
<td>Juvéderm Ultra</td>
<td>24</td>
<td>Hylacross HA</td>
<td>No</td>
<td>30</td>
<td>2006</td>
</tr>
<tr>
<td>Juvéderm Ultra XC</td>
<td></td>
<td></td>
<td>Yes</td>
<td>2006</td>
<td>2010</td>
</tr>
<tr>
<td>Juvéderm Ultra Plus</td>
<td>24</td>
<td>Hylacross HA</td>
<td>No</td>
<td>27</td>
<td>2006</td>
</tr>
<tr>
<td>Juvéderm Voluma</td>
<td>20</td>
<td>Vycross HA</td>
<td>No</td>
<td>25 or 27</td>
<td>2013</td>
</tr>
<tr>
<td>Juvéderm Volure XC</td>
<td>17.5</td>
<td>Vycross HA</td>
<td>Yes</td>
<td>30</td>
<td>March 2017 (moderate–severe facial wrinkles/folds)</td>
</tr>
<tr>
<td>Juvéderm Volbella</td>
<td>15</td>
<td>Vycross HA</td>
<td>Yes</td>
<td>30</td>
<td>June 2016 (lips)</td>
</tr>
<tr>
<td>Restylane-L</td>
<td>20</td>
<td>NASHA</td>
<td>No</td>
<td>30</td>
<td>2003, 2011 (lips)</td>
</tr>
<tr>
<td>Restylane Silk</td>
<td></td>
<td></td>
<td>Yes</td>
<td>30</td>
<td>2010, 2012 (lips)</td>
</tr>
<tr>
<td>Restylane Lyft</td>
<td>20</td>
<td>NASHA</td>
<td>Yes</td>
<td>27 or 29</td>
<td>2007, 2015 (cheek, midface)</td>
</tr>
<tr>
<td>Restylane Refyne</td>
<td>20</td>
<td>XpresHAn</td>
<td>Yes</td>
<td>30</td>
<td>2016 (moderate–severe facial wrinkles + folds)</td>
</tr>
<tr>
<td>Restylane Defyne</td>
<td>20</td>
<td></td>
<td>Yes</td>
<td>27</td>
<td>2016 (moderate–severe, deep facial wrinkles + folds)</td>
</tr>
</tbody>
</table>

Measuring Cohesivity was Made Possible With the Gavard-Sundaram Cohesivity Scale

5-point Visual Reference Scale Developed to Represent Patterns of Cohesivity

To measure cohesivity levels:
- Each HA filler was dyed blue, injected into a beaker of water and evaluated at various time intervals for its ability to maintain its shape in the water.

*In vitro* data does not imply clinical significance.
Elasticity & Viscosity Values

<table>
<thead>
<tr>
<th>Product</th>
<th>Elasticity*</th>
<th>Viscosity*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiesse</td>
<td>1,407</td>
<td>349,830</td>
</tr>
<tr>
<td>Radiesse (+) integral lidocaine</td>
<td>1,165</td>
<td>310,305</td>
</tr>
<tr>
<td>Restylane-L</td>
<td>565</td>
<td>131,310</td>
</tr>
<tr>
<td>Restylane-Lyft</td>
<td>549</td>
<td>127,090</td>
</tr>
<tr>
<td>Restylane</td>
<td>514</td>
<td>119,180</td>
</tr>
<tr>
<td>Juvéderm Voluma</td>
<td>274</td>
<td>92,902</td>
</tr>
<tr>
<td>Juvéderm Ultra Plus XC</td>
<td>136</td>
<td>32,152</td>
</tr>
<tr>
<td>Juvéderm Ultra XC</td>
<td>111</td>
<td>27,034</td>
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<tr>
<td>Juvéderm Ultra Plus</td>
<td>75</td>
<td>17,699</td>
</tr>
<tr>
<td>BELOTERO BALANCE</td>
<td>30</td>
<td>9,217</td>
</tr>
<tr>
<td>Juvéderm Ultra</td>
<td>28</td>
<td>7,307</td>
</tr>
</tbody>
</table>

*All measured at 0.7 Hz (physiologically relevant for stresses common to skin).

Rheology ReDefyned: xStrain

FLEXIBILITY IS MEASURED BY xStrain

Rheological Properties as a Scientific Rationale When Selecting the Appropriate Filler For Specific Facial Applications

<table>
<thead>
<tr>
<th>Property</th>
<th>More</th>
<th>Less</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elasticity (G’)</strong></td>
<td>Elasticity describes the ability of a gel to resist deformation when pressure is applied. <strong>Gelatin:</strong> stiffer, resists deformation. <strong>Pudding:</strong> softer, more susceptible to deformation.</td>
<td></td>
</tr>
<tr>
<td><em><em>Viscosity (n</em>)</em>*</td>
<td>Viscosity describes the ability of a gel (in the fluid phase) to resist shearing forces. <strong>Peanut butter:</strong> thicker, more resistant to spreading. <strong>Room-temperature butter:</strong> easily spreadable.</td>
<td></td>
</tr>
<tr>
<td><strong>Cohesivity</strong></td>
<td>Cohesivity describes the capacity of a material to not dissociate, because of the intrinsic affinity of the constituent molecules for each other. <strong>Honey:</strong> intrinsically sticky, resists dispersion. <strong>Brown Sugar:</strong> not sticky, more easily dispersed.</td>
<td></td>
</tr>
</tbody>
</table>

IDEAL FACIAL PROPORTIONS
A youthful look depends on having the right amount of facial fat in the right places. Redistribution, accumulation, and atrophy of fat lead to facial volume loss.\textsuperscript{1,2,4,5}

- Some areas lose fat. Examples are the forehead and cheeks.
- Other areas gain fat. Examples are the mouth and jaw.
- Modification of the fat pads leads to contour deficiencies.\textsuperscript{2-5}

In addition, the areas of fat tend to become farther apart. Instead of a smooth, almost continuous layer, the fat pads appear as separate structures.\textsuperscript{4}
Bone

There is a significant loss of facial bone with age. Aging of the craniofacial skeleton may be due to changes in the relative dynamics of bone expansion and bone resorption. Bone resorption leads to biometric volume loss.

AGE: 35
AGE: 45
AGE: 55
retaining ligaments of the face
Vycross technology

Volume is the Next Dimension

NATURAL-LOOKING RESULTS UP TO 2 YEARS WITH OPTIMAL TREATMENT\(^1,2\)

Products in the Restylane family can be used to correct moderate to severe facial wrinkles and folds. Restylane may also be used for lip enhancement in patients over 21 years.

Treatment volume should be limited to 6.0 mL in wrinkles and folds, such as nasolabial folds, and limited to 1.5 mL per lip (Restylane only), as greater amounts significantly increase moderate and severe injection site reactions. The safety or effectiveness of treatment in areas other than nasolabial folds and lips has not been established in controlled clinical studies.
Non-HA Fillers

• Calcium hydroxylapatite – CaHA
  – Radiesse and Radiesse plus
    • Indicated for subdermal implantation for the correction of moderate to severe facial wrinkles and folds such as nasolabial folds.
    • Recently approved with addition of lidocaine

• Poly-L-lactic acid (PLLA)
  – Sculptra
    • Indicated for correction of shallow to deep nasolabial fold contour deficiencies and other facial wrinkles in which deep dermal grid pattern (cross-hatch) is appropriate

• Polymethylmethacrylate (PMMA)
  – Bellafill (formerly Artefill)
    • Indicated for the correction of nasolabial folds and moderate to severe, atrophic, distensible facial acne scars on the cheek in patients over the age of 21 years
CaHa Mode of Action

Before RADIESSE®

- Destruction of collagen scaffolding is a main factor in loss of skin volume, elasticity, and firmness

Immediate 1:1 correction

- Gel matrix with CaHA microspheres immediately fills lost volume

Collagen neogenesis

- CaHA microspheres form a scaffold that stimulates fibroblasts to produce collagen

Collagen network strengthens dermis

- A firm collagen fiber network is formed in the dermis
- The aqueous gel carrier is naturally absorbed
- CaHA microspheres are naturally metabolized by macrophages

High density of collagen

- Patient’s own natural collagen is left behind, providing structural support for the dermis and facilitating the long-lasting effects of RADIESSE®

Calcium hydroxylapatite (+) Case Report
Calcium hydroxylapatite (+) Case Report
FRONTOPLASTY
Lower Eye lid rejuvenation
Thank You!