A growing number of patients are seeking non-invasive cosmetic treatments as they seek to improve skin tone and smooth wrinkles, according to survey data from the American Society for Dermatologic Surgery (ASDS). And, a growing number of physicians are injecting fillers: ASDS members performed more than 917,000 soft-tissue filler treatments in 2012, up 10.4 percent from the nearly 831,000 treatments performed in 2011, according to the 2012 ASDS Survey on Dermatologic Procedures. The ASDS Consumer Survey on Cosmetic Dermatologic Procedures asked more than 6,300 consumers for their opinions on cosmetic treatments in general and ratings for 10 specific procedures. Soft tissue fillers tied with wrinkle-relaxing injections for the highest satisfaction rating of the 10 categories (92 percent), and received the highest “extremely satisfied” rating (45 percent) from consumers. Growth is in this market is expected to continue, as 53 percent of survey respondents said they are considering soft-tissue fillers in the future.

Ahead, experts share their insights on the benefits of various fillers, along with injection tips.

ARTEFILL
By Neil S. Sadick, MD

ArteFill is comprised of 80 percent ArteFill purified bovine collagen and 20 percent polymethylmethacrylate (PMMA) microspheres, with 0.3% lidocaine for patient comfort. The bovine collagen gel used in ArteFill is sourced from a herd in the US that is controlled, bred, and monitored, according to FDA, ISO, and USDA guidelines. The collagen is highly purified and is processed to reduce potential contributors to immunogenicity. It is not cross-linked, it has the telopeptides removed, and it is partially denatured. Polymethylmethacrylate (PMMA) has a proven safety record with more than 60 years of clinical use.

The microspheres are smooth and their size is tightly controlled to be within 30 to 50 microns in diameter—the microspheres must be large enough to avoid phagocytosis by macrophages and prevent migration away from the injection site.

BENEFITS OF ARTEFILL
The FDA approved Artefill in 2006 for the correction of nasolabial folds, the most significant benefits of ArteFill are its longevity and the natural looking appearance that results from treatment. The collagen in ArteFill provides immediate wrinkle correction and is gradually absorbed by the body over time. Additionally, the PMMA microspheres have been shown to induce new collagen production and dermal remodeling.

SAFETY PROFILE
Some patients are concerned about the side effects of ArteFill, but in four-year safety studies it’s been shown that the granuloma rate is only 1.5 percent in four years. Unlike early experiences in Europe with an older generation molecule, US experience with ArteFill has been extremely positive in that its safety profile has been as good or better than any other product. A skin test is required before treatment, and there is no reversible antidote for it, but it is very simple to inject and is placed in the mid to deep dermis. Patients don’t have swelling from treatment, and it provides a natural looking outcome. Treatment with ArteFill is a bit more expensive.
than other fillers, but it lasts so much longer, offsetting any additional initial treatment costs.

**TREATMENT NICHES**

I primarily use ArteFill to treat acne scars and nasolabial folds and for local volume filling. Older patients with well-defined wrinkle lines and furrows who don’t want to come back for repeat treatments are ideal candidates for ArteFill. They love the fact that it lasts seven years and they only need to come in for one treatment.

FDA trials for ArteFill for the treatment of acne scars are currently ongoing. Most acne patients with scarring don’t want to come in for recurrent treatments every six to 12 months, so the longevity of ArteFill works in its favor for this particular niche of patients. A combination of laser resurfacing plus a long-term filler like ArteFill would be an excellent combination for acne scars. Also, the fact that the PMMA microspheres have been shown to induce new collagen production in dermal remodeling is a major advantage in treating acne scarring because it will continue to improve the contours of the acne scars. Acne scarring would be a great market for ArteFill, because it would be the first FDA approved product for acne scarring and because of its longevity. Plus, it gives you dermal remodeling.

**NEIL SADICK, MD** is in private practice in New York, and is Clinical Professor of Dermatology at Weill Cornell Medical College. He has authored more than 500 articles in peer-reviewed scientific journals, contributed more than 75 chapters of medical books, written or edited more than 10 books on cosmetic surgery, hair, and vein treatment, and has been a guest lecturer at more than 500 medical seminar classes and workshops worldwide.

Disclosure: Dr. Sadick is a clinical investigator of ArteFill.

**BELOTERO BALANCE**

By Erin Gilbert, MD, PhD

Belotero Balance is a monophasic double cross-linked hyaluronic acid gel (22.5 mg per mL with BDDE) derived from the fermentation of *Streptococcus equi* in a physiologic buffer packaged without lidocaine. The technology used to create Belotero is termed “CPM” or cohesive polydensified matrix, indicating that the particle size and density vary or are heterogeneous. These physical properties are visible on histology and may result in the improved tissue integration we see upon superficial injection clinically.

FDA-approved in 2011, Belotero has rapidly become a favorite in treating tear-trough deformity, superficial rhytids and in filling lips. Since it can be injected extremely superficially or at the level of the deeper dermis, Belotero provides the injector with a range of treatment options.

**BENEFITS OF BELOTERO**

Belotero fills a gap that has existed in our aesthetic toolbox since collagen was withdrawn from the market in 2010. Whereas the collagens ultimately proved impractical due to the required pre-injection skin testing and poor longevity, Belotero has encountered neither of these pitfalls. In clinical trials correction of nasolabial folds with Belotero persisted for 48 weeks. In my hands, correction persists for approximately six months in the tear trough, and four months in more superficially injected dynamic regions such as “smile lines.”

I most often use Belotero in the periorcular and perioral regions, as well as in acne scars. In these settings I like the natural appearing results and the softer contours I get when I inject this particular filler. One of the unique benefits if Belotero is the ability to fill and “hydrate” these regions, often at a more superficial dermal level, without undesirable side-effects, such as contour irregularities. Since I am a believer in layering product, I often use Belotero on top of, or in conjunction with other dermal fillers where I want to optimize the quality of the overlying skin.

One of my favorite qualities of Belotero is the way it integrates into more superficially injected sites when injected into thinner-skinned, or sun-damaged patients. Much like Juvederm Ultra, Belotero lacks the firmness and cohesivity of Restylane, Perlane, or Radiesse. When these fillers are placed in elastotic dermis, patients often complain of “lumps and bumps” at the injection sites. This hasn’t been the case with Belotero. My experience is that they benefit from dermal “cushioning,” textural improvement and moderate volume replacement.

**INJECTION TIPS**

If you are a new injector of Belotero, my first treatment pearl is to be sure that your luerloc needle is tightly fitted before injecting. The G’ or the elastic modulus of Belotero requires greater plunger force than might be anticipated. I advise injecting your mixed product as soon as possible, as I have also found that if you leave the mixed syringe sitting around for too long it becomes “sticky” and slightly more difficult to work with. In addition, I vary my injection technique significantly depending upon the area. In the tear trough, I inject using a serial puncture technique on periosteum. On “smile lines” or to define the vermilion border, I pull the skin taut and inject at intradermal or superficial dermal level, respectively, using a retrograde threading technique. In acne scarring I inject into the superficial dermis following gentle subcision.
PATIENT EDUCATION

I find that it is extremely important to educate your patients about what to expect following treatment with Belotero, as it is unlike any other filler they may have experienced. This is particularly true with younger patients who may request that their perioral areas or acne scars be treated. They often leave the office with visible wheals and blanching, and I let them know that this is normal, and that it will resolve within approximately 24 hours. Ice and pre-procedure anti-histamines help considerably.

Erin Gilbert, MD, PhD is a Board-Certified specialist in skin cancer prevention and treatment and in cosmetic dermatology. She is also a PhD in Neuroscience and is an authority on cutting edge research on Botulinum Toxin. She is an Assistant Professor of Dermatology, of at SUNY Downstate Medical Center, Director of Resident Education in Cosmetic Dermatology, and Chief of Dermatology, at Woodhull Hospital in Brooklyn, New York.

JUVEDERM

By Vic A. Narurkar, MD

Juvederm Ultra XC and Ultraplus XC are the most common dermal fillers used in our practice. The on-label indications for these products are for the correction of moderate to severe facial wrinkles and folds such as nasolabial folds, with an approved on-label duration of up to 12 months. They are monophasic hyaluronic acids with a high degree of cross-linking, producing greater cohesivity. In our practice, in addition to the on-label indications, the Juvederm products are our “workhorse” fillers for numerous indications, including lip augmentation, treatment of the pre-jowl sulcus, cheek augmentation, tear trough treatment, and treatment of fine lines in the perioral area and cheeks. Depending on the indication, the products may be used with or without reconstitution with normal saline, which I will discuss further ahead.

BENEFITS OF JUVEDERM

Like all hyaluronic acid based fillers, Juvederm is completely reversible with the use of hyaluronidase. This allows the physician to modify treatment in case there is improper placement or undesired cosmetic effect. The high degree of cross linking contributes to a greater cohesivity and smoother flow. Thus, there is less edema and inflammatory response compared to biphasic hyaluronic acid based fillers, particularly when used for lip augmentation. The smooth flow also produces less bumps and there is rarely a need for massage or manipulation of the product. There is a great deal of confusion about “lifting” capacity of fillers and whether a high G’ contributes a “greater lift.” For example, collagen has the highest G’ but does not produce a lift. Lifting capacities are a complex manifestation which include cohesivity and viscosity. The duration of Juvederm Ultra and Ultraplus exceeds that of comparable hyaluronic acid based fillers currently approved by the FDA, and there is increasing evidence that repeat injections even extend the duration of Juvederm. This makes it highly appealing to patients as a greater value. Finally, Juvederm contains lidocaine, which makes it extremely comfortable for patients. We rarely perform nerve blocks when injecting Juvederm.

INDICATIONS FOR JUVEDERM

While the on-label indication for Juvederm Ultra XC and Juvederm Ultraplus XC is the treatment of moderate to severe lines and folds, we now think of using these fillers in panfacial rejuvenation, which includes volumizing and filling. In other words, it is no longer just about filling nasolabial folds. Our top locations for using Juvederm Ultra plus XC are in the marionette lines, pre jowl sulcus, and chin augmentation, as well as for rebuilding loss of volume in cheeks, while our top locations for using Juvederm Ultra XC are for lip augmentation and tear trough treatment.

Dilution of Juvederm Ultra XC 1:1 with normal saline is done to treat perioral rhytids, glabellar lines, which have maximized treatment with botulinum toxin, and fine lines in the cheeks (accordion lines). Other areas of placement include the lateral brow for a brow lift using Juvederm.
Ultra Plus XC, and dilute multiple injections of Juvederm ultra XC with vigorous massage for temporal atrophy.

**TREATMENT TECHNIQUES**

While there are two different needles that come with Juvederm XC (30g) and Juvederm Ultra plus XC (27g), we prefer to use the 30g 1/2” needle for both products. For diluted Juvederm Ultra XC for the treatment of fine lines, we utilize the 32g needle. Cannulas can also be used for both products and we prefer to utilize these in areas where there are concerns about inadvertent vascular injury and for high volume indications. Patients are advised to hold any blood thinners one week prior to treatment (such as ASA, NSAIAS, and fish oil). We advise patients to come to the office without make-up or skincare products, which should be vigorously removed. The actual treatment is a clean procedure. The entire face is assessed and placement of filler is based on the indication, starting with deep placement first (for volumizing) and layering for moderate rhytids and superficial rhytids. All of our patients are offered a courtesy visit one week after treatment to re-assess the filler.

**PATIENT FEEDBACK**

The overwhelmingly positive feedback from patients has made the Juvederm family of products our number one dermal filler. The ease of injection, smooth flow, and “instant gratification” achieved make this a very desirable treatment.

In addition, it is an integral part of combination therapies, which we perform routinely in our office for panfacial rejuvenation. This includes facial resurfacing with photofacials, fractional lasers, and peels for facial canvas anomalies, treatment of dynamic rhytids of the upper and lower face with botulinum toxin, treatment of laxity with skin tightening devices, and the treatment of static rhytids, volume depletion, and lip volume corrections with the Juvederm family of products (Figure I).

**OPTIMIZING TREATMENT OUTCOMES**

As with any dermal filler treatment, knowledge of the facial anatomy is essential for proper filler placement. Facial assessment is performed at the initial visit, and areas that would benefit from dermal filler are identified. For the new patient, we take a conservative approach and discuss the idea of serial treatment with Juvederm, focusing on the area that would benefit dermal filler the most and then follow with other areas. We also are candid about the number of syringes that will be required to achieve optimal outcomes and discuss the patient’s budget. This is another reason to perform serial treatments, as it may be more conducive from a financial perspective. Proper patient preparation is essential for optimizing outcomes, which includes avoidance of blood thinning agents, removal of all make up and products, and discussing realistic outcomes of what fillers can achieve. Too often, we are told “I don’t like the chipmunk look,” or the “huge lip” look because of the over volumization and inappropriate use of dermal fillers. Slow and steady injections reduce the risks of adverse events. Bruising, if it occurs, can be treated with a vascular laser or intense pulsed light source the following day.

**CONCLUSIONS**

Juvederm Ultra XC and Ultraplus XC are the workhorse fillers in our practice. Panfacial rejuvenation with these fillers are optimized when used in a layering fashion, with Juvederm Ultraplus XC for deeper placement, Ultra XC for more superficial placement and diluted Juvederm Ultra XC for fine lines. Patients appreciate the softer feel of the HA filler, the duration, and versatility for a variety of indications. When used as a part of combination therapy with botulinum toxins for dynamic rhytids and energy based devices and peels for facial canvas anomalies, the Juvederm family of products is an integral component of total non-surgical facial rejuvenation.

Vic A. Narurkar, MD, FAAD is Director and Founder of the Bay Area Laser Institute (www.bayarealaserdr.com) and Chairman of Dermatology at the California Pacific Medical Center (www.cpmc.org).

Disclosures: Dr. Narurkar is a clinical investigator for Allergan and Merz Aesthetics.

**Radiesse**

By Heidi Waldorf, MD

Radiesse has become one of my go-to filler products. Patients are happy with it, I’m happy with it, and I love the fact that I can give patients consistent, long-lasting results with a product that is both safe and effective.

Radiesse is comprised of calcium hydroxylapatite (CaHA) microspheres suspended in an aqueous gel carrier. Once injected, it provides immediate volume and correction, and then continues to work by stimulating the body to produce its own natural collagen. The gel is absorbed, and the body metabolizes the CaHA microspheres leaving behind only a patient’s own natural collagen over time.

**THE VALUE OF RADIESSE**

Based on its elasticity and viscosity, Radiesse provides an excellent lift—a lot more lift per volume than the
other currently FDA-approved products in the United States. The product rheology plus the availability of 1.5 ml syringes translates into more bang for the patient's buck. One of these 'volume advantage' syringes of Radiesse can generally provide the lift of two average hyaluronic acid products. For patients who require hyaluronic acid fillers also—for areas where Radiesse would not be appropriate—the overall amount of filler used can generally be reduced. Hyaluronic acid gel fillers can be safely layered over Radiesse at the same visit or a later time.

TREATMENT TIPS

Radiesse is available without lidocaine included but comes with FDA-approved mixing kits. The clinician can tailor the dilution to the needs of the patient. If I need more lift—in essence a stiffer scaffolding or sharper edge—in one area, I use less lidocaine. And in another area where being able to spread and mold the filler more easily either because of the anatomy (the hands or temples) or to harness its biostimulating qualities, more lidocaine is used for a greater dilution/lower viscosity effect.

Although the on-label use of Radiesse is for the nasolabial folds, a recent study confirmed my own personal experience of using Radiesse in the upper cheeks to provide lift. By replenishing the upper and middle face, the ptosis of the nasolabial folds is reduced below and the tear trough above. The product flows well both in the provided 28g Exel needle (on label) or through a 22 or 25 gauge 1.5 inch cannula (off label).

PATIENT SATISFACTION

My patients are thrilled with Radiesse treatment because in addition to seeing immediate improvement, they see longer terms results in skin quality. Calcium hydroxyapatite serves as a nidus to stimulate neocollagenesis. That means that over the course of six months to a year, as the Radiesse is gradually being taken away by the patient’s body which should reduce the volume, the natural skin structure is improving. So the skin is better afterward even if you never use the product again. But happily these patients come back again and again so that we can continue to treat them with the product as their aging skin concerns evolve.

Heidi A. Waldorf, MD, FAAD is Director of Laser and Cosmetic Dermatology at The Mount Sinai Medical Center. She is also in private practice in New York.

RESTYLANE AND PERLANE

By Andrea Trowers, MD

Restylane and Perlane are transparent hyaluronic acid gels that are produced by Medicis. Each of these products is also available with 0.3% lidocaine added to the syringe (Restylane-L and Perlane-L) to increase patient comfort. Perlane’s hyaluronic gel size particles are larger and it contains more crosslinks than Restylane. As a result, Perlane lasts longer than Restylane and is more viscous. Restylane is FDA approved for injection into the mid and deep dermis, while Perlane is approved for injection into the deep dermis and superficial subcutis. Both products are volumizers that treat folds and wrinkles in the skin. They also stimulate collageneisis and act as humectants, thus improving the skin’s appearance beyond wrinkle correction.

TREATMENT PEARLS

Restylane and Perlane are two of my favorite tools for achieving a natural aesthetic. They are both very malleable products. In order to increase the range where these products are typically utilized, I always dilute each 1cc of either product with 0.2ccs of lidocaine and epinephrine (even if it is the L version of either product). This allows the product to be extruded with less pressure on the syringe and results in more exact placement. I believe that these fillers are the best for recreating the soft contours of the apple of the cheek that are lost with age. They are also great for...
moderate volume loss in the nasolabial fold with overlying etched in wrinkles. In this situation, Perlane can replace the volume loss, while Restylane can be layered above with microdroplets into the mid dermis (depending on the patient’s skin type and the experience of the injector). This combined layered approach produces better results than either product could produce alone.

In my opinion Restylane produces the most natural recreation of the vermilion border, cupids bow, and pillows in the upper and lower lip. In my practice, I utilize both products, once diluted, to fill the hollows underneath the eyes. It is important to not place the products superficially, which can result in bumps, swelling, and the Tyndall effect. Also, patients need to be screened as to whether they swell sometimes underneath their eyes. If they do, the water binding properties of Restylane and Perlane can significantly worsen this problem.

**BENEFITS OF RESTYLANE AND PERLANE**

There are a number of benefits to these fillers. One is that they are man-made versions of a naturally occurring substance in humans. As a result, allergy testing is not required. Also, both products can be injected (after drawing back on the syringe to make sure a blood vessel has not been entered) as boluses in the cheek areas and massaged until smooth. This technique allows the material to act as a bolster to the age-related downward slide of the cheeks. In my patient population, this age related change is common due to their interest in exercise.

I frequently tell my patients that if you want to have a good body you are eventually going to have to put filler in your face. Otherwise regular exercise combined with the natural aging process can result in hollows under the eyes, loss of cheek fullness and deepening of the nasolabial folds. Besides stimulating collagenesis, these products are also excellent humectants. This is especially evident in the tear trough area, where crepiness is frequently first apparent as an age-related skin change. Many patients comment on the glow their skin obtains following injections of Restylane and Perlane.

**MANAGING PATIENT EXPECTATIONS**

In my cosmetic practice I have found that the best-prepared patients are the happiest. It is always better to under promise and over deliver. My staff and I make sure that each patient knows that every line will not disappear with my treatment. The goal is to restore some volume loss without producing the dreaded “chipmunk face.” However, in order to prevent frantic phone calls, it is stressed to my patients every time that they are injected that they may swell and that it can take up to two weeks for the filler to settle. Just because they never swelled before doesn’t mean that they won’t this time...even if it’s their fifth time receiving treatment. Remember Murphy’s law!

I also discuss with my patients any plans for a new diet or exercise regimen. Weight changes can cause a significant change in some patients’ faces, even when the weight change is small. The option is for the patient to wait until s/he has reached his/her goal weight to be injected or to accept that more filler may be required as the weight drops.

No one ever wants to bruise a patient, but it is always a possibility when injecting fillers. There is the possibility that the vasoconstrictive effect of the epinephrine that I use to dilute Restylane and Perlane may limit bruising. But until that study is done, I have backup from my medical assistants who are always on hand to apply pressure as soon as a bruise starts to form.

Andrea Trowers, MD is a Board Certified Dermatologist, practicing general & cosmetic dermatology in North Miami, FL. She is a voluntary faculty member at the University of Miami, Department of Dermatology.

**SCULPTRA AESTHETIC**

By Susan Weinkle, MD

Sculptra Aesthetic is made of a synthetic material called poly-L-lactic acid, which works to replace lost collagen. Poly-L-lactic acid is safe and absorbed naturally by the body.

In 2009, the FDA granted approval of Sculptra Aesthetic in the US for the correction of shallow to deep nasolabial fold contour deficiencies and other facial wrinkles. Sculptra Aesthetic works to target the underlying causes of the signs of aging, such as collagen loss.

**THE BENEFITS OF SCULPTRA**

I’ve been using Sculptra since 2004 when it was originally FDA approved for the treatment of lipoatrophy in HIV patients. For anyone who is willing to realize they won’t see an immediate effect but will get a lasting and enduring effect, Sculptra creates facial magic.

The problem is there has been little direct-to-patient consumer marketing of Sculptra Aesthetic, so educating patients about this product, what it does, and how it works is on the shoulders of the physicians. Because of the original FDA approval for Sculptra for lipoatrophy, many patients have the concept that Sculptra replaces fat, which is really a misnomer. It really doesn’t have anything to do with fat.

A large majority of patients over the age of 45 experience some facial redistribution of their fat, and even if they’re
not thin, many of those patients can benefit from Sculptra. Sculptra is a biostimulator that stimulates fibroblasts to produce collagen, which in turn thickens the collagen layer. When you thicken a patient’s collagen, you change the way light reflects off his/her skin, resulting in more youthful looking skin. As we age, our collagen amount decreases and our epidermis thins, so Sculptra is very helpful for overall facial rejuvenation.

INJECTION TIPS

Another great thing about this product is that you really can inject globally all over the face. You can accentuate some areas with cross hatching if you want to lay down a little more product in a certain area, or you can treat the face globally. We now know and understand that there are certain fat pads that decrease with aging, and when the fat goes down, if you thicken the collagen over it, you improve the aesthetic appearance of the patient.

I don’t use Sculptra to treat the lips, tear troughs, or the glabella. I do use Sculptra to treat the temple, and I treat globally on the face. I don’t treat the neck, but I do treat the décolleté. To treat the décolleté, I reconstitute it up to 20ccs as opposed to the normal 8-10ccs. When I first started treating this area, I used to reconstitute it 5ccs as the package insert instructs, but now I know that I really get a better response with fewer side effects if I reconstitute it even higher.

If a patient has had or expects to have extensive dental work done, I don’t treat with Sculptra, since anecdotally, I’ve seen significant nodular formation associated with dental work.

I give my patients Arnica because I’m sticking them with a needle, and many of my patients are on anticoagulants or aspirin therapy and bruising is a factor, which Arnica helps alleviate. I give them ice after I inject them, and instruct them to massage five times a day, five minutes at a time for five days. That seems to diminish the formation of nodules by keeping the product evenly disbursed.

THE IDEAL SCULPTRA PATIENT

I live in Florida and most of my patients are more mature; the good news is that even mature fibroblasts are responsive to this treatment.

The price point is a little more expensive than other fillers, but the results last a lot longer–18 to 24 months.

Patients who are right for Sculptra Aesthetic treatment are those who are willing to be patient, because the results last longer and emerge subtly and naturally over time. Patients who are willing to come in for treatment with one to two vials to start, then come back in four to six weeks for another session, and again in another four to six weeks are all happy with the outcome. The average patient in my practice needs three treatment sessions. For patients who want an immediate result on the day of treatment, this isn’t the product for them. Patients typically begin to see improvement after the second and third sessions. Many of my patients also come back in once a year for my Sculptra booster because we don’t stop aging.

Another nice thing about this product is that even if a patient becomes ill and loses weight and her fat continues to go down, her collagen stays. I saw this with my mother, who had a lot of treatment and still looked beautiful even when she passed away at 88. It was really amazing to see.

Susan H. Weinkle, MD is an internationally renowned expert and speaker in the areas of aesthetic procedures and dermatologic surgery. She has served on the Board of Directors and chaired numerous committees for the American Academy of Dermatology and is also Past President of the Women’s Dermatological Society and Immediate Past President of the American Society for Dermatologic Surgery. In addition to running a private practice and serving as an Assistant Clinical Professor of Dermatology at the University of South Florida, Dr. Weinkle has authored numerous articles on skin carcinomas, surgical techniques, and cosmetic therapies.