Aging Gracefully Or Not?

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The Desire for Beauty

- People tend to respond positively to good-looking people without expectation of reward.
- Good-looking people tend to get away with everything.

Reversal of Aging

- Competitive job pressures
- Divorce and return to dating
- The barrage of advertising media
- The wide availability of cosmetic services
- Less social stigmata about cosmetic procedures
- Explosion of medical and surgical technology
What defines beauty?

What creates age?

The Golden Ratio – Divine Proportion

\[
\frac{a+b}{a+b} = \frac{a}{b}
\]

a\ +\ b\ is\ to\ a\ as\ a\ is\ to\ b
What happens to the face with aging?
Multiple Factors Contribute to Timing and Degree of Facial Aging

- **Intrinsic factors**
  - Genetics
  - Time
  - Evolution
  - Expressivity
  - Atrophy of dermis and subcutaneous tissue
  - Bone resorption and change

- **Extrinsic factors**
  - Sun exposure
  - Gravity
  - Smoking


Aging

- Photoaging
- Gravitational aging
- Volumetric aging

[Diagram of UV rays and their effect on skin]
UV Damage

How does the sun affect your skin?

Skin Type – Your Ability to Tan

- Fitzpatrick skin phototype (1975)
  1. Always burn, never tan
  2. Always burn, but sometimes tan
  3. Sometimes burn, but always tan
  4. Never burn, always tan
  5. Moderately pigmented skin
  6. Darkly pigmented skin
Clinical Signs of Photoaging

- Lentigines
- Dyschromia
- Keratosis
- Telangiectasia
- Loss of translucency
- Loss of elasticity
- Sallow color

Glogau – Photoaging Scale

<table>
<thead>
<tr>
<th>Type</th>
<th>Early Photoaging</th>
<th>Moderate Photoaging</th>
<th>Advanced Photoaging</th>
<th>Severe Photoaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>Mild pigmentary changes</td>
<td>Early senile lentigines</td>
<td>Obvious dyschromia</td>
<td>Yellow-gray color of skin</td>
</tr>
<tr>
<td></td>
<td>No keratosis</td>
<td>Palpable keratosis</td>
<td>Visible keratosis</td>
<td>Prior skin cancer</td>
</tr>
<tr>
<td></td>
<td>Minimal wrinkles</td>
<td>Parallel smile lines</td>
<td>Parallel smile lines static</td>
<td>Wrinkles throughout</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type II</td>
<td>20'-30'</td>
<td>40'-50'</td>
<td>50' and older</td>
<td>60'-70' and older</td>
</tr>
<tr>
<td></td>
<td>No to light foundation</td>
<td>Light to moderate foundation</td>
<td>Heavy foundation</td>
<td>&quot;Cakes and cracks&quot;</td>
</tr>
</tbody>
</table>

Stages of Photoaging
UV Camera:  
*The Damage Beneath Your Skin*

Resurfacing Without Volume Replacement –  
“Better but not younger”

The Loss of Subcutaneous Fat

- Forehead
- Temporal fossa
- Premalar area
- Perioral area
- Earlobes
Changes in the Underlying Cartilage and Bone

Dermal atrophy + Lipoatrophy
+ Muscle atrophy + Bone and Cartilage Loss
= Biometric Volume Loss

Gravitational Aging:
Inherent Loss of Elasticity

- Stretching
- Sagging of soft tissue
Biometric Volume Loss and Gravitational Aging Inverts Geometry

The Triangle of Youth Evolves Into...The Pyramid of Age

Approach of the Face - Non-Surgical Facial Rejuvenation

Aging Gracefully?

Enhancement  Rejuvenation  Restoration
Treatment Approach to the Aging Face

- Photoaging
- Gravitational aging
- Volumetric aging
- Resurfacing
- Retightening
- Refilling

Goals

- Reshape
  - Retighten
  - Refill
  - Revolumize
- Resurface
  - Retexture
  - Recolor

Combination Therapies

- Dyschromia – Topicals, peels, IPL, laser
- Wrinkles
  - Dynamic – Botulinum Toxin
  - Static – Filler, laser resurfacing
- Volume loss – Fillers, fat transplantation, implants
- Gravitational loss – Blepharoplasty, face lift
The dark and bright side of sun exposure

From sun tan oils to sunscreens

Public attitude toward tanning

“Pale is the new tan”
FDA new sunscreen regulations

- Broad Spectrum designation
- Only SPF>15 can claim to reduce the risk of skin cancer and can be broad spectrum
- Ultra high SPF is misleading
- "Waterproof," "sweat proof" or "sun block" banned

What does broad spectrum mean?

What does SPF mean?
What’s in the bottle?

- Zinc oxide
- Titanium dioxide
- Avobenzone
- Mexoryl

Inorganic vs. organic sunscreen

How to apply sunscreen?

1. How much
How to apply sunscreen?

1. How much
2. When
   Physical – anytime
   Chemical – min 15 minutes
3. How often
   Physical – when wet, sweaty
   Chemical – every 2 hours of sun

Is there a safe way to tan?

Vitamin D: wonder pill or overkill
Vitamin D Controversy

<table>
<thead>
<tr>
<th>Low level of Vit D</th>
<th>How to increase level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone fractures</td>
<td>Tanning</td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td></td>
</tr>
<tr>
<td>Decreased immune system</td>
<td></td>
</tr>
<tr>
<td>Multiple sclerosis</td>
<td></td>
</tr>
</tbody>
</table>

Sources of Vitamin D

- Sunlight (90%)
- Dietary intake (10%)
- Vitamin supplements

How does sun give you vitamin D?
**Skin type determines rate of vitamin D production**

- Light skin burns readily, but achieve maximal vitamin D photosynthesis
  - DNA damage, photoaging
- Darker skin does not burn, but also photosynthesize relatively limited amounts of vitamin D
  - Limited DNA damage and photoaging

**Less than 10 minutes of UVB is sufficient**

- If you have light skin: maximum photosynthesis reached in 2-8 min midday
- Twice weekly midday sun exposure to face, arms and legs for 5-30 min provides healthy level of vitamin D

**AAD Safe Sun Position**

- UV irradiation causes
  - Non melanoma skin cancer
  - Melanoma
  - Photoaging
- The only established health benefit of UV irradiation is vitamin D synthesis
  - HOWEVER vitamin D can be obtained from diet and supplements
“Vitamin D from UV exposure is free and easy to get – why pass up the simplest way to improve your odds of preventing cancer?”

Tanning beds

- FDA does not regulate it
- UVB similar to the sun in older units
- UVA 10-15 times higher than the sun

Pre-vacation tanning

- UVB induced tan = SPF 3
- Tanning bed induced tan = SPF 1.3
Tanning Bed UVA vs. Vitamin D UVB

- High pressure tanning beds: no or minimal UVB emission
- UVB needed for Vitamin D production
- Tanning bed emitting 1.5% UVB increases D3 levels, plateau reached after 4 sessions x 6 min

Artificial tanning is “carcinogenic to humans”

- Tanning bed exposure before age 30, increases melanoma risk by 75%
Lasers and Other Light Devices

- Intense Pulse Light
  - Non-coherent high intensity light filtered to achieve ranges of wavelength
  - 550-900 nm
  - Multiple applications
    - Redness
    - Pigment
    - Hair
    - Photorejuvenation

Intense Pulse Light

Photorejuvenation
Solar Lentigo

Vessels

RESURFACING
There is Always Airbrushing…

Skin Resurfacing

- Dermabrasion
  - superficial
- Chemical Peeling
  - Superficial
  - Medium depth
  - Deep - ablative
- Laser resurfacing
  - Fractionated
  - Ablative

Laser Resurfacing
Skin Regeneration Process

After Fractional CO2 Laser

Immediately After Laser

- Ablated epidermis and dermis

Post 2 days

- Re-epithelialization and collagen synthesis

Post 14 days

- Complete epidermal regeneration
- Continua collagen

Improvement of fine lines

Before

After

(RE)TIGHTEN
New Techniques

Radiofrequency Technology

Clinical Application -Tightening

- Face
  - Best for jawline, submental region
- Non-facial
  - Neck – excellent results
  - Abdomen, arms and upper thighs
- Cellulite
US vs. RF vs. Laser

<table>
<thead>
<tr>
<th>Ultherapy</th>
<th>RF</th>
<th>Lasers</th>
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</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>60-70°C</td>
<td>55-65°C</td>
</tr>
<tr>
<td>Depth</td>
<td>4.0 mm, 3.0 mm &amp; 1.5 mm</td>
<td>3.0 mm</td>
</tr>
<tr>
<td>Precise</td>
<td>Precise &amp; Fractional</td>
<td>Precise &amp; Fractional</td>
</tr>
</tbody>
</table>

Cryolipolysis

- Deoxycholic acid injection to dissolve fat
- Non-surgical option for the treatment of submental fullness

Kythera’s ATX-101
How do lines and wrinkles form?

- “Wrinkles merely mark where smiles have been” – Mark Twain
- Extensive sun (UVA) exposure
- Movement of muscles causes the skin to crease
- Skin becomes less elastic over time; repeated muscle movement creates lines and wrinkles
- Weakening muscles prevent wrinkle formation

<table>
<thead>
<tr>
<th>Wrinkles</th>
<th>Dynamic</th>
<th>Static</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lines, grooves and furrows</td>
<td>Fine to deep lines with weathered skin</td>
</tr>
<tr>
<td></td>
<td>Glabella, forehead, periorbital and</td>
<td>Cheeks, lips, forehead</td>
</tr>
<tr>
<td></td>
<td>perioral lines</td>
<td></td>
</tr>
</tbody>
</table>

Corrugator muscle

Procerus muscle
**Botulinum Toxin**

- A purified protein complex derived from the bacterium *Clostridium botulinum*
- Seven serotypes: A, B, C1, D, E, F and G.
- Block release of acetylcholine from presynaptic terminal of neuromuscular junction (NMJ), causing local paralysis in area of functional denervation

**Approved for Aesthetic Use**

- **BOTOX Cosmetic** (onabotulinumtoxinA)
  - FDA-approved in 2002
  - Approved in 80+ countries
  - 20+ years of experience worldwide
  - 50 U, 100 U per vial
  - BOTOX and BOTOX Cosmetic are same formulation

- **DYSPORT** (abobotulinumtoxinA)
  - FDA-approved in 2009
  - Approved in 75+ countries
  - 20+ years of experience worldwide
  - 300 U per vial

- **XEOMIN** (incobotulinumtoxinA)
  - FDA-approved in 2009
  - Approved in 80+ countries
  - 20+ years of experience worldwide
  - 300 U per vial

**Contraindications and Adverse Effects**

- **Contraindications**
  - Myastenia Gravis
  - Amyotrophic Lateral Sclerosis
  - Myopathies
  - Calcium channel blockers
  - Aminoglycoside antibiotics
  - Pregnancy, lactation

- **Adverse effects**
  - Temporary bruising, nausea, headache, blepharoptosis, skin rashes (rare), flu-like symptoms (rare)
Glabellar Frown Lines

Horizontal Forehead Lines

Crow’s Feet Injections
Bunny Lines Injection

Perioral Wrinkles

Mouth Frown
Peau d'orange Chin

Horizontal Necklace Lines

Platysmal Bands
REVOLUMIZE

Volume loss with aging

Liquid face lift – Y lift
Do they all look the same?

Pillow Face, Chipmunk Cheeks, Piggy Eyes: The New Cosmetic Epidemic
Following blindly the injection points

The danger of over volumizing – aging gracefully?

HA & Non-HA Soft Tissue Fillers

<table>
<thead>
<tr>
<th>Temporary biodegradable</th>
<th>Semipermanent biodegradable</th>
<th>Permanent nonbiodegradable</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA fillers</td>
<td>CaHA microspheres</td>
<td>PMMA microspheres</td>
</tr>
<tr>
<td>PLLA microspheres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultured human fibroblasts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hyaluronic Acid Fillers

- Cross-linked glycosaminoglycan polymers
  - Low rate of hypersensitivity reaction
- Minimally invasive
  - Little or no postprocedural recovery time
- Reversible
  - If desired after implantation, can be removed with hyaluronidase
- May stimulate collagenesis

NASHA, nonanimal stabilized hyaluronic acid.

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>FDA Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restylane</td>
<td>NASHA</td>
<td>No</td>
<td>30</td>
<td>2006, 2011</td>
<td></td>
</tr>
<tr>
<td>Restylane-L</td>
<td>NASHA</td>
<td>No</td>
<td>30</td>
<td>2010</td>
<td></td>
</tr>
<tr>
<td>Juvederm Ultra</td>
<td>24</td>
<td>Hylacross HA</td>
<td>No</td>
<td>30</td>
<td>2006</td>
</tr>
<tr>
<td>Juvederm Ultra Plus</td>
<td>24</td>
<td>Hylacross HA</td>
<td>No</td>
<td>27</td>
<td>2006</td>
</tr>
<tr>
<td>Perlane</td>
<td>NASHA</td>
<td>No</td>
<td>27 or 29</td>
<td>2007, 2010</td>
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</tr>
<tr>
<td>Restylane Silk</td>
<td>NASHA</td>
<td>Yes</td>
<td>30</td>
<td>2014</td>
<td></td>
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<tr>
<td>Belotero Balance</td>
<td>22.5</td>
<td>Yes</td>
<td>30</td>
<td>2011</td>
<td></td>
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</tbody>
</table>

Currently Marketed Non-HA Fillers

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Source</th>
<th>Depth</th>
<th>Particle Size (diameter)</th>
<th>Lidocaine</th>
<th>Needle Size</th>
<th>FDA Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiesse²</td>
<td>CaHAP</td>
<td>Deep dermis</td>
<td>25–45 μm microspheres</td>
<td>No</td>
<td>26 G</td>
<td>2006</td>
</tr>
<tr>
<td>Artefill³</td>
<td>PMMA</td>
<td>Reticular dermis</td>
<td>30–50 μm microspheres</td>
<td>Yes</td>
<td>26 G</td>
<td>2006</td>
</tr>
<tr>
<td>Sculptra aesthetic²</td>
<td>PLLA</td>
<td>Deep dermis</td>
<td>40–65 μm microspheres</td>
<td>No</td>
<td>26 G</td>
<td>2009</td>
</tr>
<tr>
<td>laViv²</td>
<td>Autologous fibroblasts</td>
<td>Superficial papillary dermis</td>
<td>10–15 μm</td>
<td>No</td>
<td>30 G</td>
<td>2011</td>
</tr>
</tbody>
</table>

Calcium Hydroxyapatite (Radiesse®)

- Calcium based-microspheres suspended in a natural gel.
- Microspheres form scaffold to support and stimulate collagen.

Stimulatory Fillers

- Poly-L-Lactic Acid (Sculptra®)
  - A biodegradable aliphatic polyester
  - Series of 3 injection, lasts 2 years
  - Approved for facial lipoatrophy in people with HIV lipodystrophy syndrome

Flow Characteristics of Fillers: Elasticity (\(G'\)) and Viscosity (\(\eta^*\))

- Firm to palpation
- More tissue lifting
- Contour stability
- Higher extrusion force during injection

- Soft to palpation
- More tissue spreading
- Moves with facial movement
- Lower extrusion force during injection

Flow Characteristics of Fillers: Elasticity & Viscosity

<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 + 0.3% lidocaine</td>
<td>554</td>
<td>143,100</td>
</tr>
<tr>
<td>Restylane-L</td>
<td>565</td>
<td>131,310</td>
</tr>
<tr>
<td>Perlane-L</td>
<td>549</td>
<td>127,090</td>
</tr>
<tr>
<td>Restylane</td>
<td>514</td>
<td>119,180</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>
</tr>
<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).


Tailoring Treatment for Optimal Outcomes

Tear Through Correction
Melolabial Folds

Lip Augmentation

Hand Rejuvenation
Pan-Facial Restoration

Most Common Side Effects

Significant persistent swelling (particularly the lips)

Tyndall effect from overly superficial placement

Overcorrection with lumpiness

Arterial and Venous Occlusion
SUMMARY

• Protect your skin from the sun
• Don’t compete with the stars or your neighbor
• Be the best you can be
• Never retire but put new tires on; resurface, revolumize, refresh and relax
• Never stop playing
• Age with grace; young at heart, slightly older at other places.

The recipe for what makes a woman sexy at any age is simple: beauty, brains and class, all served straight up, with a healthy dose of confidence.