

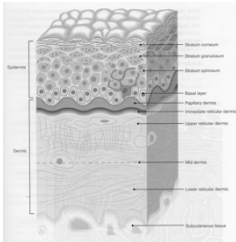
***Skin Conditions Appropriate for
Chemical Peels***

Aurora Badia, MD

***Choosing the Correct Peeling Agents
Aurora Badia, DO***

*The following potential conflict of interest relationships are
germane to my presentation.*

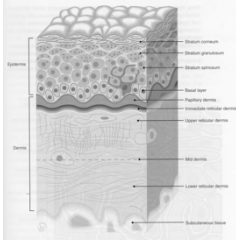
***Histological Depth of
Penetration of Chemical Peels***



- **Superficial, very light**
 - Wounding to level of stratum spinosum
- **Superficial, light**
 - Wounding through entire epidermis

Obagi ZE. 1999. Obagi Skin Health Restoration & Rejuvenation. New York, Springer Science & Business Media.

Histological Depth of Penetration of Chemical Peels



- **Medium depth**
 - Wounding to level of upper reticular dermis
- **Deep**
 - Wounding to midreticular dermis

Obagi ZE. 1999. Obagi Skin Health Restoration & Regeneration. New York, Springer Science & Business Media.

Classification of Chemical Peeling Agents

- **Superficial, very light**
 - TCA 10-20%
 - Low potency alpha hydroxy acid
 - Beta hydroxy acid
 - Retinoin
- **Superficial, light**
 - TCA 20-30%
 - Jessner' s solution
 - 70% glycolic acid

Classification of Chemical Peeling Agents

- **Medium depth**
 - 35-40% TCA
 - 88% phenol (unoccluded)
 - Solid CO₂ plus 35% TCA
 - Jessner' s solution plus 35% TCA
 - 70% glycolic acid plus 35% TCA
- **Deep**
 - Baker Gordon phenol peel

***Choosing Chemical Peeling
Agents: General Guidelines***

- Sagging skin only responds to phenol peel and only if skin is relatively thin
- Neck does not respond well to chemical peels
- Expression wrinkles benefit from botulinum toxin type A treatment prior to any peel; allows skin to regenerate on non-moving base
- Photoaging and free radical aging from smoking and pollution can be treated with chemical peels; healing speed and quality of results depends on peel depth

***Choosing Chemical Peeling
Agents: General Guidelines***

- Active acne should only be treated by medium peel after it has been treated medically and infection has cleared
- Facial acne scars are difficult to treat
- Results of treatment of hyperpigmentation disorders depend entirely on depth of problem and depth of treatment; only way to treat melasma permanently is to completely destroy melanocytes
- Solar lentigines respond to peels in Grenz zone and papillary dermis
- Peels are not intended for hypertrophic scars

Acne

Pathophysiology of Acne

- Sebaceous follicle ductal hypercornification
- Hyperseborrhea
- Increased number of P. acnes
- inflammation

Types of Acne

- Acne vulgaris
- Acne conglobata
- Acne fulminans
- Acne excoriee
- Other types include mechanical, occupational, drug-induced, neonatal, and infantile

Acne Vulgaris



- Most common
- Three types of lesions
 - Non-inflamed lesions
 - Inflamed lesions
 - Scars

Vivier A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

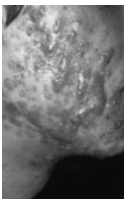
Acne Vulgaris

- **Non-inflamed lesions**
 - Microcomedones
 - Closed comedones (whiteheads)
 - Open comedones (blackheads)
- **Inflamed lesions**
 - Papules
 - Pustules
 - Nodules
 - cysts

Acne Vulgaris

- **Scars**
 - Atrophic scars
 - Ice pick
 - Rolling
 - Boxcar
 - Hypertrophic
 - Keloids

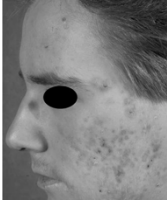
Acne Conglobata



- Chronic, severe form of inflammatory acne
- Characterized by grouped comedones, cysts, abscesses, draining sinus tracts and scars

Vivier A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

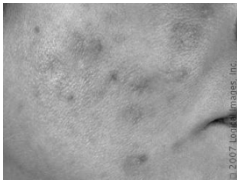
Acne Fulminans



- Multiple, intensely inflamed nodules, cysts, and plaques

Wivier A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

Acne Excoriee



- Predominantly found in young adult women
- Picking and scratching of lesions leads to inflammation and crusting

Wivier A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

Chemical Peels for Acne

- Glycolic acid 70%
- Jessner's solution
- Salicylic acid 25%
- Pyruvic acid 40-70%
- TCA 25-30%
- Unna paste (resorcinol 40%)
- Phenol 45-80%

Indications

- **Comedonal acne**
 - Glycolic acid
 - Jessner
 - Salicylic
 - Pyruvic acid
 - Unna paste

Indications

- **Mild/moderate inflammatory acne**
 - Salicylic acid
 - Pyruvic acid
 - Glycolic acid
 - Jessner
 - Unna paste
- **Severe nodulo-cystic acne**
 - Pyruvic acid

Indications

- **Superficial post acneic scars**
 - Pyruvic acid
 - TCA
 - Salicylic plus TCA
- **Medium-deep post acneic scars**
 - Phenol
 - TCA >40%

Frequency of Application

- Glycolic acid: 3-6 peels every 1-2 weeks
- Jessner's solution: 3 peels every 2 weeks
- Salicylic acid 25%: 3-8 peels every 2-4 weeks
- Pyruvic acid 40-70%: 3-8 peels every 2-4 weeks
- Salicylic acid plus 25-30% TCA: 5-6 peels every 4-5 weeks
- Phenol: 1 treatment

Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Advantages of Various Agents

- Salicylic acid
 - Safety and efficacy in darker phototypes (V-VI)
 - Possible association with other substances such as TCA and pyruvic acid to improve absorption
 - Easier to manage than glycolic acid in terms of uniformity of application
- Salicylic acid and pyruvic acid better than glycolic and Jessner in terms of risk of side effects and patient discomfort
- Glycolic acid preferred over Jessner: equal treatment effect but lesser degree of exfoliation in glycolic acid

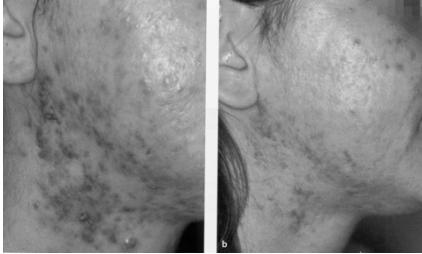
Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Acne Results



Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

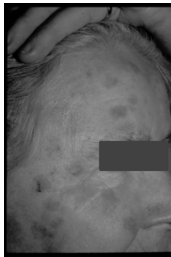
Acne Results



Tosti A, Grimes PE, DePaolove MP, et al. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Actinic Keratoses

Actinic Keratoses



- Most common epithelial precancerous lesions occurring on sun-exposed skin of middle-aged and elderly people as multiple erythematous macules or papules with dry adherent scale

Vivier A. Atlas of Clinical Dermatology Third Edition. London: Elsevier Limited, 2002.

Causes of Actinic Keratoses

- Prolonged exposure to sunlight
- UV light from artificial sources
- X-radiations

Types of Actinic Keratoses

- Asymptomatic: developments such as tenderness, induration, erosions, and enlarging diameter may lead to squamous cell carcinoma
- Hypertrophic: may appear clinically as cutaneous horn due to significant hyperkeratosis

Types of Actinic Keratoses

- Spreading pigmented: displays variation in pigmentation with smooth, verrucous or scaly surface and centrifugal spreading, usually greater than 1cm in diameter; referred to as a proliferative AK when spreading to more than 3 cm diameter with undefined borders

Types of Actinic Keratoses

- Lichenoid: solitary or multiple violaceous or brown flat-topped papules, resembling lesions of lichen planus
- Actinic cheilitis: typical of vermillion of lower lip; diffuse scaling, with blotchy and atrophic appearance; erosions may indicate squamous cell carcinoma

Pathophysiology of Actinic Keratoses

- Epidermal dysplasia with alterations in cell polarity and mild nuclear atypia
- Hyperkeratosis, parakeratosis, irregular acanthosis and thinning of granular layer
- Atypical keratinocytes extend into papillary dermis
- Dermis reveal solar elastosis

Differential Diagnosis

- Basal cell carcinoma: nodule with telangiectatic surface or ulcerated lesion with pearly translucent border
- Discoid lupus erythematosus: disc like patches with adherent thick scales and follicular plugging, atrophic scarring
- Seborrheic keratosis: uneven, verrucous surface, soft consistency; presents on non sun-exposed areas

Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Differential Diagnosis

- Solar lentigo: circumscribed pigmented macule, no surface scaling
- Verrucous naevi: present at birth or developed during childhood
- Warty diskeratoma: elevated papule with keratotic umbilicated center, occasionally found on non-sun-exposed skin

Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Treatment of Actinic Keratoses with Chemical Peels

- Superficial chemical peel
 - 25-30% TCA
- Medium depth chemical peel
 - 35% TCA
 - 50-70% pyruvic acid

Actinic Keratoses Results



Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Melasma

Melasma



- Acquired hyperpigmentation disorder characterized by tan, brownish macules and patches that occur on sun-exposed skin
- Most commonly observed in women skin types IV-VI

Winer A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

Causes of Melasma

- Idiopathic
- Sun exposure
- Genetic predisposition
- Pregnancy
- Oral contraception
- Elevated LH, FSH, estradiol levels
- Thyroid dysfunctions
- Antiseizure drugs
- Cosmetics

*All significantly increase tyrosinase activity in producing melanin

Clinical Patterns of Melasma

- Centrofacial
- Malar
- Mandibular

Types of Melasma

- Epidermal: increased melanin in basal, suprabasal, and stratum corneum layers; clinically, melasma is light brown
- Dermal: increased melanin in superficial and deep dermis; clinically, melasma is dark brown to gray

Types of Melasma

- Mixed: increased melanin in epidermis and dermis; clinically, melasma is dark brown
- Indeterminate melasma: melasma in patients with Fitzpatrick skin type VI

Wood's Lamp

- Epidermal melasma appearance will be enhanced by Wood's lamp
- Dermal melasma will not show under Wood's lamp
- Mixed melasma will not show under Wood's lamp

Melasma Area and Severity Index (MASI)

- Subjective classification
- Face divided into four areas
 - F: forehead (30%)
 - MR: right malar (30%)
 - ML: left malar (30%)
 - C: chin (10%)

MASI

- Melasma graded in each of these areas according to
 - A: percent total area involved
 - 0=no involvement 6=90-100% involvement
 - D: darkness
 - 0=absent 4=maximum
 - H: homogeneity or hyperpigmentation
 - 0=minimal 4=maximum

MASI

- **MASI formula = 30%(DF+HF) + 30% (DMR +HMR)AMR + 30%(DML+HML)AML + 10%(DC +HC)AC**
- **Maximum value of MASI= 48 meaning severe hyperpigmentation**

Melasma Therapy Objectives

- **Slow proliferation and growth of melanocytes**

- **Inhibit formation of melanin and promote melanosome destruction**

Melasma Treatment Options

- **Broad spectrum sunscreens**
- **Topical depigmenting agents**
 - Tyrosinase inhibitors
 - Antioxidants
 - Melanogenesis inhibitors
 - Exfoliants
- **Chemical peels**
- **Laser**
- **Cryotherapy**

***Treating Melasma with
Chemical Peels***

- **Superficial peeling**
 - 25% salicylic acid
 - Glycolic acid 50-70%
 - TCA 15-20%
 - Resorcinol
- **Combined peeling**
 - 25% salicylic acid and 10% TCA
- **Medium peeling**
 - Pyruvic acid 50%

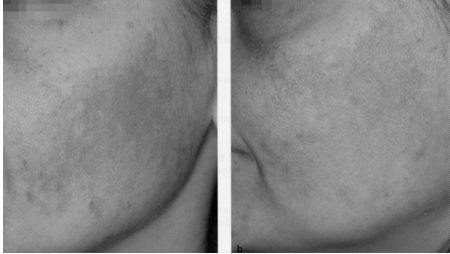
***Treating Melasma with
Chemical Peels***

- Patients should undergo superficial peeling every 2 weeks or medium peeling every month
- 3 week pre-procedure and 10 day post-procedure
 - Morning regimen
 - Alpha-hydroxy cleanser
 - UVA/UVB sunscreen
 - No sun exposure
 - Evening regimen
 - Alpha-hydroxy cleanser
 - Hydroquinone/kojic acid every 2 days
 - Topical retinoid every 2 days

Effect of Combination Peels

- Salicylic has keratolytic effect, eliminating superficial pigmented, keratinocytes and stimulating cell turnover
- Allows TCA to act at low concentration to remove pigmented keratinocytes to papillary dermis
- Results in moderate to low inflammation
- Lower number of treatments required

Melasma Results



Torali A, Grimes PE, DePadova MP, et al. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Photoaging

Photoaging



- Superimposed effects of photodamage on intrinsically aging skin
- Consequence of chronic, UV exposure

Vivier A. Atlas of Clinical Dermatology Third Edition. London: Elsevier Limited, 2002.

Features of Extrinsic Aging

- Fine and coarse wrinkles, sallowness, laxity, mottled pigmentation, textural roughness, telangiectasia
- Epidermal “basket-weave” or compact stratum corneum, acanthosis, and/or atrophy, keratinocyte atypia, flattened rete ridges
- Dermis: prominent Grenz zone, elastogenesis, elastosis, collagen degeneration, loss of anchoring fibrils

Glogau’s Classification of Photoaging

Glogau Type I (Mild)



- Ages 20’ s-30’ s
- Early photoaging
- Mild dyschromia
- No keratoses
- Minimal wrinkling
- Minimal or no scarring

Glogau Type II (Moderate)



- Last 30' s-40' s
- Early senile lentigines
- Dyschromia
- Early actinic keratoses
- Parallel smile lines
- Early wrinkling
- Some makeup worn
- Mild acne scarring

Glogau Type III (Advanced)



- Usually aged 50-65
- Dyschromia, telangiectasia
- Visible keratoses
- Wrinkling at rest
- Always wears make-up
- Moderate acne scarring

Glogau Type IV (Severe)



- Patient age 60-75
- Actinic keratoses
- Prior skin cancers
- Wrinkling throughout
- Make-up cakes and cracks
- Severe acne scarring

***Therapeutic Treatment Options
for Photodamage***

- **Topical**
 - Broad spectrum sunscreens
 - Retinoids
 - Vitamin C
 - Alpha hydroxy acids
 - Polyhydroxy acids
 - Beta hydroxy acids
 - Bleaching agents

***Therapeutic Treatment Options
for Photodamage***

- **Resurfacing**
 - Microdermabrasion
 - Superficial chemical peeling
 - Medium-depth chemical peels
 - Deep chemical peeling
 - Ablative laser resurfacing
 - Nonablative laser treatment
 - Radiofrequency

***Treating Photodamage with
Chemical Peels***

- **Mild to moderate photodamage**
 - Glycolic acid 50-70%
 - TCA 30%
 - Salicylic acid 20-30%
 - Salicylic acid plus TCA <25%
- **Extensive photodamage**
 - Glycolic acid 70% plus TCA 35%
 - Jessner's solution plus TCA 35%
 - Pyruvic acid 60-70%
 - Phenol 45-80%

Photodamage Results



Tosti A, Grimes PE, DePadova MP, et al. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

***Post-Inflammatory
Hyperpigmentation***

***Post-Inflammatory
Hyperpigmentation***



- Acquired presence of darker macules and skin patches occurring at sites of previous cutaneous inflammatory conditions

Vivier A. Atlas of Clinical Dermatology Third Edition. London: Elsevier Limited, 2002.

***Post-Inflammatory
Hyperpigmentation***

- Usually a result of allergic reactions, inflammatory skin disorders, therapeutic interventions, mechanical injuries
- Usually occurs in Fitzpatrick skin types IV-VI
- Appears to be an increase in melanin production and/or abnormal distribution of pigment

Differential Diagnosis

- Fixed drug eruption
- Systemic drug-induced hyperpigmentation
- Macular amyloid
- Ashy dermatosis
- Melasma
- Medication: tetracyclines, antimalarial drugs, arsenic, bleomycin, doxorubicin

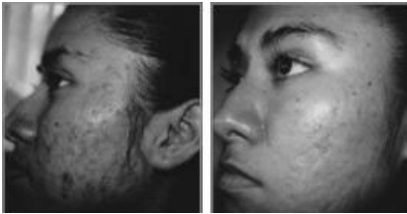
PIH Therapy

- Prevention of further pigment deposition
- Diminish altered discoloration
- Treatment/removal of etiologic insult
- Broad spectrum sunscreens
- Topicals agents
 - Retinoids
 - Bleaching agents

Chemical Peels for PIH

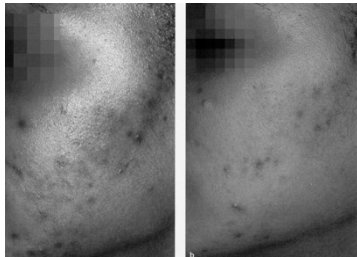
- Salicylic acid 20-30%
- Glycolic acid 70%
- Jessner's solution
- Pyruvic acid 40%

PIH Results



Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

PIH Results



Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Rosacea

Rosacea

- Chronic inflammatory disorder affecting central facial area
- Vascular irregularity complicated by inflammatory changes
- Endocrine, psychological, pharmacological, immunological, infectious, thermal, alimentary factors contribute to vascular instability and tissue damage
- Symptoms include skin dryness and sensitivity, stinging and burning

***Erythemato-Telangiectatic
Rosacea***



- Flushing and persistent central facial erythema usually associated with telangiectasia

Vivier A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

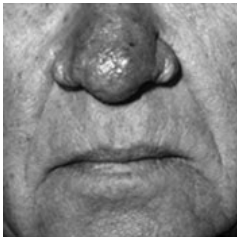
Papulo-pustular Rosacea



- Persistent central facial erythema associated with inflammatory papules and pustules

Vivier A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

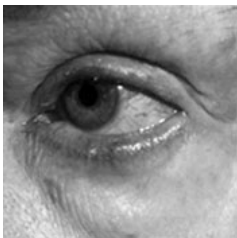
Phymatous Rosacea



- Irregular skin thickening due to sebaceous hyperplasia

Vivier A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

Ocular Rosacea



- Eye involvement common and may precede skin lesions
- Ocular symptoms include foreign body sensation, burning, or stinging, dryness, itching, photosensitivity, telangiectasia

Vivier A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

Granulomatous Rosacea



- Papular and nodular lesions affecting cheeks and perioral areas

Winer A. Atlas of Clinical Dermatology Third Edition. London: Elsevier Limited, 2002.

Differential Diagnosis

- Acne vulgaris
- Seborrheic dermatitis
- Systemic lupus erythematosus
- Lupus miliaris disseminatus faciei
- Sarcoidosis

Melasma Therapy

- Avoidance of factors that trigger or cause flushing via vasodilation

Flushing Triggers

- Climatic
 - Sun exposure
 - Extreme heat or cold
 - Humidity
 - Windy weather
- Emotional
 - Anger
 - Anxiety
 - Embarrassment
 - Stress
- Temperature
 - Sauna, hot bath
 - Working in high temperatures
- Physical exercise
- Food/beverage
 - Alcohol
 - Spicy foods
 - chocolate

Flushing Triggers

- Food/beverages
 - Vinegar
 - Certain fruits/vegetables
- Drugs
 - Antidepressants
 - ACE inhibitors
 - Statins
 - Vasodilators
 - Topical corticosteroids
- Cosmetics
 - Containing alcohol, perfume, and other ingredients that irritate sensitive skin
 - soaps

Chemical Peels for Rosacea

- Salicylic acid peels performed at 3 to 4 week intervals
- Salicylic acid produces antimicrobial activity, reduces erythema and prevents relapses

Erythrosis Treatment

- 15% to 25% to 30% salicylic acid peels performed at 3 week intervals
- Combine with topical treatment of metronidazole cream and sunblock

Papulo-Pustular Treatment

- 25% -30% salicylic acid performed at 3 week intervals
- Combine with systemic treatment with metronidazole or antibiotics

Rosacea Results



Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Solar Lentigo

Solar Lentigo



- Macular area of brown pigmentation appearing after acute or chronic sun exposure
- Caused by photoaging

Vivier A. Atlas of Clinical Dermatology Third Edition, London: Elsevier Limited, 2002.

Solar Lentigo Pathology

- Linear increase of melanocytes at dermal-epidermal junction
- No cytological atypia
- Elongation of papillae and interpapillary ridges

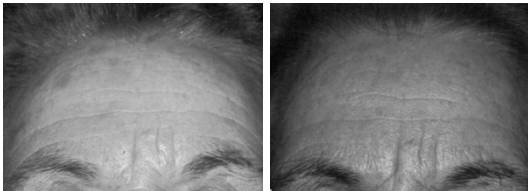
Solar Lentigo Therapy

- Sunscreen
- Topical depigmenting agents
 - Tyrosinase inhibitors
 - Antioxidants
 - Peeling agents
 - Melanogenesis inhibitors
- Cryotherapy
- Laser

Chemical Peels for Solar Lentigo

- TCA >25%
- Salicylic acid 25% plus TCA 25-30%
- Pyruvic acid 50-70%
- Phenol 45-80%

Solar Lentigo Results



Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.

Chemical Peels and Ethnic Skin

Ethnic Skin

- Fitzpatrick skin types IV-VI
- Melanocytes of darker skin produce more epidermal melanin
- Melanosomes distributed throughout epidermis in darker skin
- Increased stratum corneum layers, increased desquamation, increased lipid content, decreased ceramide content

Peel Indications for Ethnic Skin

- Melasma
 - Post-inflammatory hyperpigmentation
 - Acne
 - Pseudofolliculitis barbae
 - Textural changes
 - Oily skin
 - Wrinkles
 - Photodamage
- **benefits of chemical peeling in dark skin can be achieved utilizing superficial peels

Peeling Preparation

- Pretreatment 2-4 weeks with bleaching agent
- Discontinue 1-2 days before peel
- Peels performed at 2-4 week intervals in a series of 3-6 treatments
- Post treatment includes topical products and bleaching agents

Peels for Ethnic Skin

- Salicylic acid 20-30%
- Jessner's solution
- Glycolic acid 20, 35, 50, 70%
- TCA 10-30%

Ethnic Skin Results



Tosti A, Grimes PE, DePadova MP, ed. Color Atlas of Chemical Peels. New York, Springer Publications 2006.
