

# Senescent Skin

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## SUMMARY

The cutaneous surface is continually influenced by aging and environmental factors. A longer life span is accompanied by an increase in the frequency of problems associated with aging skin. Although most of these changes and lesions are not life threatening, the premalignant lesions must be recognized and treated. The common aging and actinic skin changes are discussed and appropriate management is described.

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ALL TISSUES and organs develop, alter and mature from the antenatal period, through birth, childhood, puberty and advancing years. Aging is a biologic-philosophic term applied by some to this continuous process, while others select an arbitrary chronologic period in which certain involutinal alterations are expected. The most conspicuous aging changes occur in the skin, an organ readily accessible for observation and evaluation. Age is primarily estimated by the appearance of the exposed portions of the skin and its appendages. The onset of these objective changes is determined by a complex combination of genetic, systemic and external factors. Senescent cutaneous modifications can occur in young people, while older skin may be free of the usual stigmata of aging. Usually there is a marked contrast between exposed and unexposed skin related more to the environmental effects of sunlight, wind and heat than to aging alone.

Elderly skin may be yellowish or sallow in appearance. Its surface tends to become wrinkled, furrowed, shiny, loose or taut. The skin feels thinner due to a loss of elastic fibers and subcutaneous fat. Coarse folds appear over flexures and in areas related to the muscles of expression, resulting in a change of facial contour. The fine wrinkles, which increase with age, are related to the atrophy of dermal papillae and epithelial flattening. The keratin layer is less able to retain water, and therefore becomes dry and fissured with scaling, redness and macular hyperpigmentation. The nails become coarse, brittle, thicker or thinner with slower growth.

There is a tendency for loss of scalp and body hair. While men can be concerned about the loss of scalp hair, women can be unhappy about the hairs which appear on the chin and above the upper lip. The soft hairs of the nose and ears become coarse, while the eyebrows tend to be bushy. Although grey hair is popularly associated with aging, it depends more on genetic influences than on age. Accelerated hair loss can be related to anticoagulants, antimitotic drugs and other medications. Endocrine dis-

orders, nutritional difficulties and neoplastic diseases add to this problem.

## Unexposed Skin Changes

Visible aging alterations are related to temporal morphologic and functional changes, which differ in type and degree in covered skin regions and in areas subject to sunlight exposure. Although aging atrophy of covered epidermis has been accepted, there are indications that this might not occur at this site.<sup>1</sup> Both regions demonstrate increased epidermal mitoses, aberrant epidermal cells with collagen, elastin and ground substance changes. There is a decrease in the number of melanocytes in both areas, with variability in their size and function. Eccrine sweat glands are reduced in number and function. Sebaceous and apocrine secretions are also decreased.

## Sun Exposed Skin Changes

Changes in exposed skin are modified primarily by the damaging effects of sunlight exposure. It would be an error to attribute all pathologic changes in exposed skin entirely to old age. The complex effects of ultraviolet radiation injure both the epidermis and dermis. Basophilic degeneration in the upper half of the dermis is the most striking feature. A loss of the epidermal rete ridges results in a flat, thinned atrophic epidermis. Continued solar damage results in disorderly maturation of the epidermal cells, blending with the premalignant changes of actinic keratoses.

## Dry Skin Pruritus

The aging are subject to most of the symptoms and dermatoses which afflict others. Pruritus, the commonest symptom in dermatology, is usually related to altered cutaneous physiologic functions but may also be caused by renal, metabolic and neoplastic disorders. It is magnified in the aged by dehydrated keratin, diminished sebum, arteriosclerosis and psychiatric disturbances. During the winter months, lower relative humidity, over-zealous cleanliness,

woollen underclothing and heavy bed clothes contribute to 'the winter itch'.

### Dehydrated Keratin

The elderly patient with chronic or cyclic pruritus can benefit from judicious manipulation of these factors. Keratin must contain at least 10 percent moisture to remain supple. Sweat contributes to this moisture level, while sebum retards moisture loss. This loss is increased by the high room temperatures, low humidity and air currents of central heating. Soaps, detergents and solvents remove the surface sebum with a resultant loss of moisture, but soap substitutes are less active in this respect. Keratin can be rehydrated by soaking the skin in clear water for several minutes. This moisture is then trapped in the keratin by the application of simple effective hydrophobic substances such as petrolatum jelly, mineral oil or vegetable oil. However, too generous application can result in a greasy skin feeling.

### Moisturizing Creams

Some may prefer to use one of the 'nicer' moisturizing cosmetic creams or lotions containing oleaginous material, water, emulsifiers and perfume. Bath oils containing mineral or vegetable oils, fatty esters and dispersing agents achieve similar results. These substances adsorb to the skin during bathtub soaking, helping the keratin retain its moisture. Glycerine is of doubtful use as a moisturizing agent. It will aggravate dryness by withdrawing moisture from the skin when the humidity is low. Atmospheric moisture will be extracted for the skin's benefit only when the humidity is high.

Topical antipruritic preparations containing menthol and

phenol, in a lotion or an oily base, can relieve itching. Appropriate systemic antipruritics such as Forhistal, Panectyl, Periactin, etc., are useful in certain individuals. However, the potential side effects of these medications can be exaggerated in the elderly. Many receive relief from aspirin alone. Vasodilating alcoholic and caffeine beverages intensify pruritus; these are contraindicated.

### Wrinkles and Reality

The earliest signs of the aging process appear on the exposed portions of the face and neck as part of the general cutaneous changes. Atrophic, less elastic skin is associated with a diminution of subcutaneous fat and muscles. Normal transient muscular lines about the eyes are converted into permanent 'crow's feet' wrinkles radiating from the outer canthi, while transverse wrinkles develop on the lower eyelids. Loose redundant lower eyelid tissue permits fat herniation to produce pouches in this region. Lax skin changes can also be prominent on the upper eyelids, cheeks and neck. These manifestations are usually tolerated as a badge of time by most people. Some women are greatly distressed at the signs of this natural waning of youth which they cannot conceal, even with the skillful use of cosmetics. Much to the joy of the multi-million dollar cosmetic industry, many will begin a long hopeful search for their rejuvenating agent from a bewildering number of substances which have included queen bee royal jelly, bovine blood extract, placenta extract, orchid pollen, mink oil, shark oil and turtle oil. Estrogens in cosmetics do not have any beneficial effects on aging skin. Pregnenolone may create temporary 'plumping' of tiny 'crow's feet'. Any temporary improvement in fine skin surface lines is probably due

Fig. 1.

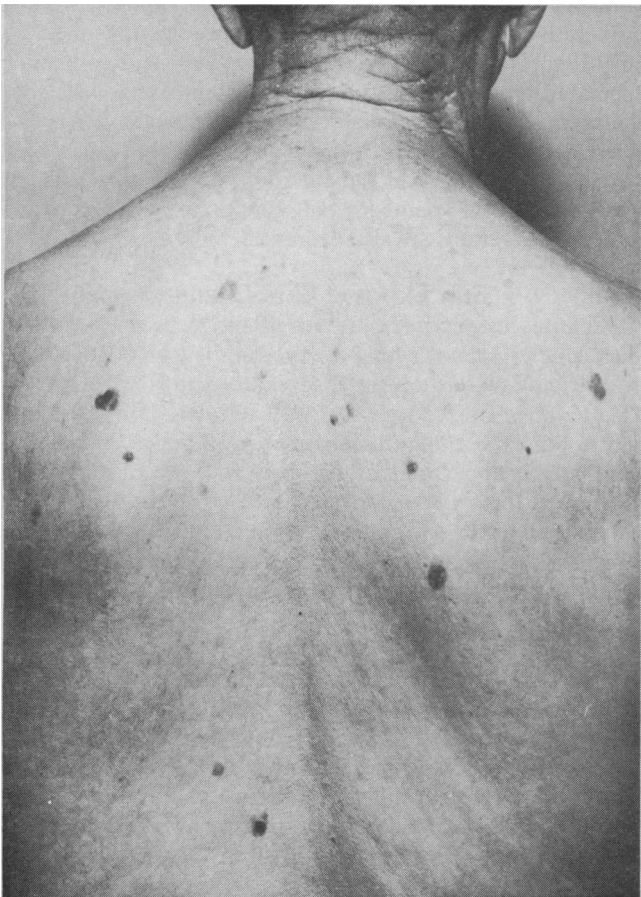
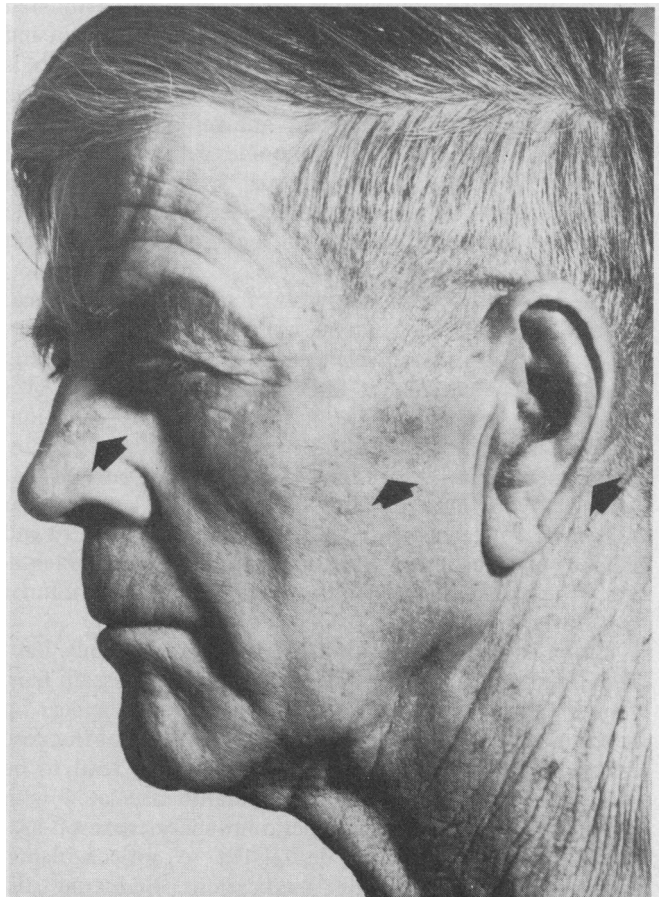


Fig. 2.



entirely to the emollients in the cream base.

Plastic surgery will improve wrinkles, redundant skin and pouches, but not all individuals are suitable for this form of management. Each must be evaluated on a physical and psychic basis. Although physical changes can be improved, it may be impossible to alter psychological attitudes which lead to disappointment with the surgical results. Many are very grateful for the restored confidence which is associated with a more youthful appearance.

### Cosmetic Preparations and Their Uses

Cosmetic preparations can be used to help women of any age to achieve self-assurance in their appearance. They add color and will cover minor skin imperfections. Their opaque powder ingredients assist in filtering out ultraviolet radiation and in postponing aging changes. Emollient lotions and creams temporarily soften and smooth the skin with the oil and moisture they supply. Since basic formulae are similar, the price of a cosmetic usually has very little relationship to its effectiveness. The most economic product which feels and smells acceptable can be just as effective as a higher priced preparation.

### Seborrheic Keratoses

Seborrheic keratoses are found on the trunk (Fig. 1), limbs and face of persons past middle life. They are benign, well localized, thickened brownish lesions appearing stuck on the skin surface. The soft, friable verrucous surface has a greasy feeling. These lesions increase in number over the years. Treatment of solitary lesions is usually simple light electrocautery or curettage. It may be impossible and impractical to accede to a patient's request for total

eradication of a hundred or more seborrheic keratoses. Where diagnosis is uncertain, a biopsy will rule out melanocytic lesions and pigmented basal cell epitheliomas.

### Actinic Keratoses

Actinic, 'solar', 'senile' keratoses are usually limited to sun injured areas of the face (Fig. 2), neck, arms and dorsa of the hands (Fig. 3). This damage is more pronounced in older, fair skinned individuals but it can occur in youth. Localized disorderly maturation of the epidermal cells (Fig. 4) results in circumscribed, telangiectatic, reddish-brown, harsh scaly growths. Bleeding points are prominent when the tenacious scale is removed. Frank squamous cell carcinoma occurs in 25 percent of the patients. Metastases are less likely when a squamous cell carcinoma arises from an actinic keratosis than at other sites. Enlarging, inflamed, infiltrating and ulcerating actinic keratoses should be biopsied to determine whether or not carcinomatous changes have occurred. No clinician is astute enough to rule out these changes on clinical grounds alone.

Actinic keratoses are treated by whichever destructive means are compatible with the removal of a potentially malignant nidus and acceptable cosmetic results. Electrocautery, electrodesiccation and curettage must be more thorough in this precancerous lesion than in the treatment of the benign seborrheic keratosis. Extensive multiple lesions are best treated by the use of 5-fluorouracil preparations.<sup>2</sup> This drug selectively interferes with the replication of abnormal epidermal cells, sparing normal skin. It has a capacity for seeking out areas of subclinical epidermal dyskeratosis. The one percent 5-fluorouracil cream, Fluoroplex Cream (Allergan), is rubbed into the

Fig. 3.



Fig. 4.

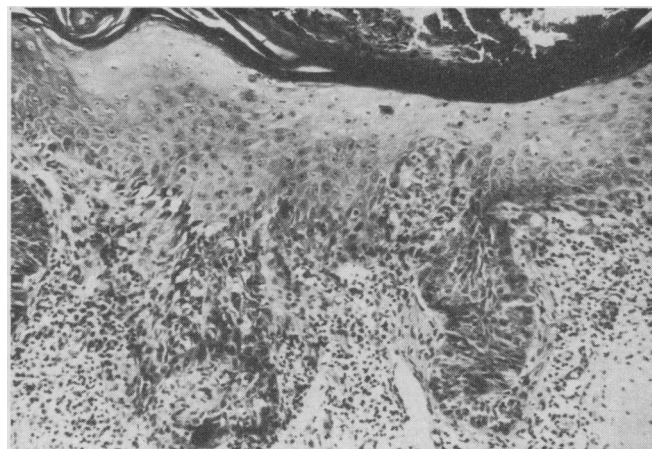


Fig. 1. Multiple seborrheic keratoses on the back in various stages of development. Rhomboidal actinic, 'farmer's skin' changes on the neck. (All illustrations are of the same patient).

Fig. 2. Multiple actinic keratoses on the ear and cheek with a large inflamed actinic keratosis on the side of the nose.

Fig. 3. Wrinkled actinic degeneration of the skin on the hands, with multiple actinic keratoses.

Fig. 4. Photomicrograph of a biopsy from the inflamed nose actinic keratosis, showing hyperkeratotic scale, epidermal acanthosis, dyskeratosis with premature epidermal cell keratinization and a chronic inflammatory infiltrate in the dermis.

affected areas twice daily with a cotton applicator, avoiding the regions about the mouth and eyes. A tender erythematous reaction begins in the lesions within four to ten days, reaching a peak after 10-14 days. The cream is discontinued at this point. This reaction is followed by necrosis, ulceration and epidermal separation with usually scar-free healing in one or two weeks. Treated areas should be protected from sunlight exposure, since ultraviolet radiation aggravates the reaction. Lesions on the hands and arms are less responsive. Patients with multiple lesions would be well advised to learn the application technique and effects on a test lesion. Although improvement is sustained, retreatment may be necessary, since these individuals are vulnerable to the development of new actinic keratoses.

### Cherry Angiomas

The earlier ominous significance of cherry angiomas (senile angiomas, Campbell de Morgan spots) as the hallmarks of visceral cancer is unfounded.<sup>3</sup> They can appear in early age, become more frequent after adolescence and are almost universal in the sixties and seventies. Cherry angiomas increase in number and size with advancing age. These circumscribed cherry red maculopapules are created by an over-growth of dilated blood vessels. The trunk and limbs are most frequently involved. Although they are best left alone, surgery or electrofulguration will remove the lesions of cosmetic concern or those subject to traumatic bleeding.

### Senile Lentiginos

The reduced number of melanocytes in exposed skin have an abnormal structure and function, resulting in an irregular distribution of melanin,<sup>4</sup> giving the skin a mottled hypopigmented and hyperpigmented appearance with the formation of senile lentiginos — 'liver spots'. These flat, uniformly brown, 1-2 mm sized macules show a predilection for the backs of the hands, forearms and neck. They are benign and of only cosmetic importance. Treatment consists of protection from sunlight exposure and the daily application of hydroquinone bleaching creams. It takes several months before the lesions become lighter in color. The patient must be warned to discontinue the hydroquinone cream if a contact reaction appears at the site of treatment.

### Malignant Lentigo

It is estimated that one third of these premalignant lesions of melanocytes develop into malignant melanoma over a period ranging from one to 30 years. This uncommon 'malignant freckle' usually appears past middle life as a brown macule or patch, 10 mm to several centimeters in diameter, predominately located on exposed areas with preference for the face. The lesion enlarges slowly over several years, with color alterations of brown-black and a reticulated black stippling on the brown background. Since the lesion develops over many years, it may be neglected until there is evidence of melanoma transformation with marked color change, induration and bleeding. The early lesion of malignant lentigo differs from the benign senile lentigo in size, color, progression and pathology. Small malignant lentigo lesions, proven by biopsy, can be re-

moved by simple surgical means with minimal cosmetic defect. Larger lesions will require more extensive surgical removal and plastic repair. Destructive procedures may not be thorough enough to remove the depths of the lesion.

### Perleche

Perleche is an uncomfortable angular cheilitis of the labial commissures with a bilateral crusted, whitish, fissured, macerated inflammation which may extend to the adjacent mucosa and facial skin. In the elderly, the sagging facial tissues and malocclusion of ill-fitting dentures create pockets of moisture which become infection sites for bacteria and candida. Perleche responds well to the topical application of the neomycin-nystatin-triamcinolone Kena-comb ointment (Squibb) and to a correction in the denture fitting. Although perleche usually appears in individuals who have no evidence of vitamin lack, similar changes occur in riboflavin deficiency. Combined vitamin deficiencies may be factors in some of the elderly who have reduced vitamin intake related to economics or to poor dietary habits. The addition of a multiple vitamin will often assist their response to topical treatment.

### Regression and Prophylaxis of Actinic Changes

Despite the fact that there is no controlled experimental evidence to prove regression of actinic changes, there are indications that protection from continued actinic exposure can promote some improvement. Partial resolution has been noted in actinically damaged skin when it was transplanted to protected areas.<sup>5</sup> Aging and actinic changes can be delayed on exposed skin by protection from sunlight. This entails early prophylactic avoidance of undue sunlight exposure, such as sunbathing, the use of topical sunprotective preparations and shading apparel. Such measures are essential for the fair skinned individual and for those who already have experienced precancerous and cancerous skin lesions.

### Comments

Because we are still unable to halt the aging process, its associated skin problems assume greater importance with the steady increase in life expectancy. Physicians must be prepared to assist older patients to maintain good cutaneous health for their physical and emotional well-being. Appropriate skin symptoms and lesions should be treated and the patient must receive considered advice for retarding the expected changes with reassurance about the variety of lesions occurring at this stage of life. ◀

### References

1. FREEMAN, R. J.: *The Skin*, edited by Helwig, E. B. and Mostofi, F. K., Baltimore, Williams and Wilkins, 1971, p. 246.
2. RICHARDS, R. N.: *The Use of Topical 5-fluorouracil in Actinic Keratoses*. *Canad. med. Assn. J.* 105: 1314-1315, 1971.
3. BEAN, W. B.: *Vascular Spiders and Related Lesions of the Skin*. Springfield, Charles C. Thomas, 1958, p. 228.
4. MITCHELL, R. E.: *The Effect of Prolonged Solar Radiation on Melanocytes of the Human Epidermis*. *J. Invest. Dermat.* 41: 199-212, 1963.
5. GERSTEIN, W., and FREEMAN, R. G.: *Transplantation of Actinically Damaged Skin*. *J. Invest. Dermat.* 41: 445-450, 1963.

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### CORRECTION

In Dr. H. A. Pickard's article (CFP March 1974 p. 53) the bibliography was inadvertently omitted. This is available as a reprint on request.