







## What types of freckles are there?

There are two basic types of freckles: simple freckles and sunburn freckles. Simple freckles are usually tan, round, and small -- about the size of a common construction nail head. Sunburn freckles are often darker, have irregular jagged borders, and may be larger than a pencil eraser. Sunburn freckles are more common on the upper back and shoulders where people frequently get their most severe sunburns.

*Ephelides* (singular: *ephelis*) is the Greek word and medical term for freckle. This term refers to flat spots that are tan, slightly reddish, or light brown and typically appear during the sunny months. They are most often found on people with light complexions, and in some families, they are a hereditary (genetic) trait. People with reddish hair and green eyes are more prone to these types of freckles. Sun avoidance and sun protection, including the regular use of sunscreen, may help to suppress the appearance of the some types of freckles.

*Lentigines* (singular: *lentigo*) comes from the Latin word for *lentil* and is the medical term for certain types of darker freckles and sunburn freckles. Lentigines tend to be darker than the common freckle and do not usually fade in the winter. This kind of spot is referred to as *lentigo simplex*. Although occasionally lentigines are part of a rare genetic syndrome, for the most part they are just isolated and unimportant spots.

### **What are "liver spots" or "age spots"?**

"Liver spots" or "age spots" are the common names of the darker spots seen in adults, frequently on the back of the hands. The term "liver spot" is actually a misnomer since these spots are not caused by liver problems or liver disease. While freckles do tend to appear over time, they are not in themselves a sign of old age. Instead, they appear generally on sun-exposed areas, more so in people who have a genetic tendency to develop them. So, they are by no means purely a function of age.

These spots are just the *lentigo*-type freckles that are commonly seen on the skin of older adults with a history of sun exposure.

Sometimes, older people who have these *lentigo*-type freckles also have raised, brown, crusty lesions called *seborrheic keratoses* in or around the same areas. *Seborrheic keratoses* are also benign (not malignant) growths of the skin. Some patients call these growths "barnacles" or "Rice Krispies." Although they are most often medium brown, they can differ in color ranging anywhere from light tan to black. They occur in different sizes, too, ranging anywhere from a fraction of an inch (or centimeter) to an inch (2.5 cm) in diameter. Typically, these growths are around the size of a pencil eraser or slightly larger. Some *keratoses* begin as a flat *lentigo* and gradually raise and thicken to form a *seborrheic keratosis*.

The telltale feature of *seborrheic keratoses* is their waxy, stuck-on, greasy look. They look like they have either been pasted on the skin or may look like a dab of melted brown candle wax that dropped on the skin. *Seborrheic keratoses* may occur in the same areas as freckles. *Seborrheic keratoses* are also more common in areas of sun exposure, but they may also occur in sun-protected areas. When they first appear, the growths usually begin one at a time as small rough bumps. Eventually, they may thicken and develop a rough, warty surface.

Seborrheic keratoses are quite common especially after age 40. Almost everybody may eventually develop at least a few seborrheic keratoses during their lifetime. They are sometimes referred to as the "barnacles of old age."

## **How do freckles develop?**

Freckles are thought to develop as a result of a combination of genetic tendency (inheritance) and sun exposure. Two people receiving the same sun exposure may not have an equal chance of developing freckles. Natural sunlight and artificial tanning lights emit ultraviolet (UV) rays. After exposure to ultraviolet rays, the outer layer of the skin (the epidermis) thickens and the pigment-producing cells (the melanocytes) produce the pigment melanin at an increased rate. (This production of melanin may in fact give some protection against future sun exposure.)

Of course, people differ a great deal in their reaction to sunlight. To take an extreme example, there is no pigmentation in the skin of an albino because of a defect in melanin metabolism. On the other hand, people with dark complexions are relatively less sensitive to sun exposure than fair-skinned people. However, people with dark skin are not entirely resistant to the effects of the sun, and they, too, can become sunburned with prolonged exposure. People with blond or red hair, light-colored eyes, and fair skin are especially susceptible to the damaging effect of UV rays.

Irrespective of skin color, freckling is caused by the uneven distribution of the melanin pigment in the skin.. A freckle is essentially nothing more than an unusually heavy deposit of melanin at one spot in the skin.

## **How important is heredity with freckles?**

Heredity and skin type are very important factors for the tendency to develop freckles. Freckles

tend to be inherited genetically and are most common in individuals with fair skin and/or with blond or red hair.

Research in twin siblings, including pairs of identical twins and pairs of fraternal (nonidentical) twins, have found a striking similarity in the total number of freckles found on each pair of identical twins. Such similarities were considerably less common in fraternal twins. These studies strongly suggest that the occurrence of freckles is influenced by genetic factors. In fact, the variations in freckle counts appear to be due largely to heredity.

Ongoing research in a rare disease called xeroderma pigmentosum has also confirmed the genetic tendency of freckles. Excessive freckles in dark-haired individuals are quite common in this disease.

Further, freckles are also found in skin folds like the underarms in another uncommon genetic disease called neurofibromatosis.

### **What is the medical meaning of freckles?**

True freckles pose essentially no health risk at all. They are all absolutely harmless. They are not cancerous and generally do not become cancerous.

Rare concerns about freckles may arise when they are associated with other diseases like xeroderma pigmentosum and neurofibromatosis or when they are confused with the following, more serious conditions:

- Lentigo maligna ("malignant freckle"): This is an uncommon fairly superficial skin cancer that generally occurs on the faces of older adults who have a history of considerable sun exposure. Over the course of months to years, this condition may, if untreated, develop into a more aggressive malignant variety called lentigo maligna melanoma. There are, of course, many hundreds of ordinary facial freckles for every one that is potentially malignant. A simple in-office test called a skin biopsy can help diagnose lentigo maligna.

- Melanoma: This very dangerous form of skin cancer may appear even in young people and on parts of the body that are sun-exposed as well as those that are protected.. While the exact cause of melanoma is not entirely known, ultraviolet rays (particularly UVA) are known to play a part. Melanomas can arise from a previously normal mole or pigmented spot that has been present many years or lifelong. Melanomas can also arise from completely normal skin without an apparent preexisting mole. In comparison with benign (noncancerous) freckles, melanomas tend to be larger, darker, and have more irregular color and shape variations.. Most melanomas are actually flat and not raised as many people tend to incorrectly assume.

- Basal cell carcinoma: This is the most common type of skin cancer. These are usually pearly, pink or reddish in color and may bleed easily. Pigmented basal cell carcinoma is a type of basal cell that may be confused for a freckle or seborrheic keratosis because of its brown or dark color. A simple procedure called a skin biopsy can help diagnose this growth.

### **A warning:**

Anyone who has one or more uncertain pigmented spots should have their physician or dermatologist evaluate them. Even verbal descriptions and photographs cannot convey enough information for satisfactory self-diagnosis. As always, it is better to be safe than sorry.

The American Academy of Dermatology recommends a full-body skin examination for adults as part of a routine annual health exam. It is important to have any new, changing, bleeding mole or growth examined by your physician or dermatologist as soon as possible. Skin cancers are curable if diagnosed and treated at an early stage.

### **How can freckles be prevented?**

Since we cannot change our own genetic component of freckling, our main prevention measures are aimed at sun avoidance and sun-protection, including

1. use of sunscreens with SPF (sun protection factor) 30,

2. use of wide-brimmed hats (6 inches),
3. use of sun-protective clothing (shirts, long sleeves, long pants),
4. avoidance of the peak sun hours of 10 a.m. to 4 p.m., and
5. seeking shade and staying indoors.

Ideally, freckle prevention is more effective than later trying to remove freckles that have already developed. Freckle-reduction treatments are more difficult and not always satisfactory.

People with known hereditary tendencies of freckling should start sun protection early in childhood. Much of the sun and UV skin damage occurs often while children are under age 18.

Fair-skinned people who are more prone to freckling and sunburns are also generally more at risk for developing skin cancers. Freckles may be a warning sign of sensitive skin that is highly vulnerable to sunburn and to potential skin cancer.

## **How can freckles be treated?**

Several safe and effective methods are available to help lighten or reduce the appearance of freckles: Frequently, multiple or a combination of treatments may be required for best results. Not everyone's skin will improve with similar treatments and freckles can easily recur with repeated UV exposures.

1. Bleaching or fading creams: Products containing hydroquinone and kojic acid can be purchased with and without a prescription. Higher concentrations of hydroquinone (over 2%) require a prescription. These products can help lighten freckles if they are applied consistently

over a period of months. Bleaching or fading creams are most effective in combination with sun avoidance and sun protection.

2. Retinoids: Sometimes used in conjunction with other bleaching creams, tretinoin (vitamin A acid, Retin-A), tazarotene (Tazorac), adapalene (Differin) also may help lighten freckles when applied consistently over a period of several months.

3. Cryosurgery: A light freeze with liquid nitrogen in the physician's office can be used to treat some types of freckles. Not all spots respond to freezing or burning.

4. Laser treatment: Multiple types of lasers may help lighten and decrease the appearance of freckles safely and effectively. Like cryosurgery, this is a simple and safe procedure with a high success rate and a low risk of scarring or skin discoloration.

5. Photofacials or Intense Pulsed Light treatments are another method to lighten and remove freckles. This is not a true laser technique but an intense light source.

6. Chemical peels can also help lighten freckles and improve irregular pigmentation.

## **The value of freckles?**

Some people like their freckles, while others may be more bothered by their appearance. The cosmetic improvement of the skin is a frequent request among people with freckles. On the other hand, freckles are desirable by some people who like the special character or uniqueness these give them.

Freckles can have their value. One is in poetry. For example, without freckles, Oliver Wendell Holmes (1809-1894), the American physician, professor, and man of letters, could not have written:

His home! the Western giant smiles,  
And twirls the spotty globe to find it;  
This little speck, the British Isles? 'Tis but a freckle, never mind it.

### **Freckles At A Glance**

- Freckles are usually friendly, small tan or light brown spots on sun-exposed skin.
- Freckles can be mistaken for moles and other skin growths.
- Freckles themselves are quite harmless and rarely develop into skin cancer.
- Freckles can be confused with more serious skin problems.
- Skin cancer can at times masquerade or hide as a freckle.
- Uncertain colored or pigmented spots should be examined by your physician or dermatologist.
- Effective treatments are available to help lighten or eliminate bothersome freckles