



## **What is melasma?**

Melasma is a common acquired skin disorder that presents as a bilateral, blotchy, brownish facial pigmentation.

## **Who gets melasma?**

Melasma is more common in women than in men, with an onset typically between the ages of 20 and 40 years. Melasma is most common in people who tan easily or have naturally brown skin. It is less common in people with very light skin or very dark skin.

## **What causes melasma?**

The cause of melasma is complex. It has been proposed to be a photoaging disorder in genetically predisposed individuals. The pigmentation ultimately results from overproduction of melanin by melanocytes (pigment-producing cells). The pigment is either taken up by keratinocytes (superficial/ epidermal melasma) and/or deposited in the dermis (deep/dermal melasma).

Factors implicated in the development of melasma include:

- Family history — 60% report affected family members
- Sun exposure — ultraviolet and visible light promote melanin production
- Hormones — pregnancy and the use of estrogen/progesterone-containing oral contraceptives, intrauterine devices, implants, and hormone replacement therapy, are implicated in one-quarter of affected women; thyroid disorders can be associated with melasma
- Medications and scented products — new targeted therapies for cancer and perfumed soaps, toiletries, and cosmetics may cause a phototoxic reaction to trigger melasma
- Researchers are examining the roles of stem cell, neural, vascular, and local hormonal factors in promoting melanocyte activation.

## **What are the clinical features of melasma?**

Melasma normally presents as bilateral, asymptomatic, light-to-dark brown macules or patches with irregular borders.

Distinct patterns include:

- Centrifacial — forehead, cheeks, nose, upper lip (sparing the philtrum); 50-80% of presentations
- Malar — cheeks, nose
- Mandibular — jawline, chin
- Erythosis pigmentosa faciei — reddened or inflamed
- Extrafacial — forearms, upper arms, shoulders in a sun-exposed distribution.

Melasma can be separated into epidermal, dermal, and mixed types, depending on the level of increased melanin in the skin.

### **Epidermal melasma**

Epidermal melasma is defined by:

- Border: well-defined
- Colour: dark brown
- Woods lamp: appears more obvious
- Dermoscopy: Scattered islands of brown reticular network with dark fine granules
- Treatment: usually has a good response.

### **Dermal melasma**

Dermal melasma is defined by:

- Border: ill-defined
- Colour: Light brown to blue-grey
- Wood lamp: no accentuation
- Dermoscopy: reticuloglobular pattern, telangiectasia, arciform structures
- Treatment: usually has a poor response.

### **Mixed melasma**

Mixed melasma is the most common type, and is defined by:

- Combination of blue-grey, light and dark brown colors
- Mixed patterns seen with Woods lamp and dermatoscope
- Treatment usually shows a partial improvement.

### **What are the complications of melasma?**

Melasma can have a severe impact on quality of life due to its visibility.

### **How is melasma diagnosed?**

Melasma is usually a clinical diagnosis based on the clinical appearance, and examination with a Wood lamp and dermatoscope.

Occasionally a skin biopsy may be taken. Histology varies with the type of melasma, but typically the following features are seen:



- Melanin deposited in basal and suprabasal keratinocytes
- Highly dendritic (branched) intensely pigmented melanocytes
- Melanin within dermal melanophages
- Solar elastosis and elastic fibre fragmentation
- An increase in blood vessels.

Serial photography and severity indices such as the Melasma Area and Severity Index (MASI) or modified MASI can be used to monitor response to treatment.

## What is the treatment for melasma?

A combination of measures is required for the best control of pigment.

### General measures

- **Year-round, life-long sun protection** — broad-brimmed hat, broad-spectrum very high protection factor (SPF50+) sunscreen containing iron oxides (tinted sunscreen) and mineral blockers (zinc oxide and titanium dioxide), and sun smart behavior (sun protective clothing, sun avoidance)
- Discontinue hormonal contraception if possible
- Cosmetic camouflage such as Dermablend full coverage foundation.

### Topical therapy

The most successful formulation has been a combination of **hydroquinone, tretinoin**, and sometimes a mild potency topical steroid, is reported to clear or improve 60–80%.

Other topical agents used alone or, more commonly, in combination have included:

- Azelaic acid
- Kojic acid
- Ascorbic acid (Vit. C)
- Tranexamic acid

Many other agents are under investigation.

### Oral treatment

**Tranexamic acid** blocks conversion of plasminogen to plasmin, with downstream effects inhibiting synthesis of prostaglandin and other factors involved in melasma.



## Procedural techniques

**Chemical peels** and lasers can be used with caution but carry a risk of worsening melasma or causing post-inflammatory hyperpigmentation. **Patients should be pretreated with a tyrosinase-inhibitor, such as hydroquinone.**

Superficial epidermal pigment can be peeled off using alpha-hydroxy acids (AHA), such as glycolic acid, or beta-hydroxy acids (BHA), such as salicylic acid, or mixed chemical peels containing a combination of ingredients.

Microneedling, intense pulsed light (IPL), and lasers including Q-switched Nd:YAG, ablative and non-ablative fractionated and picosecond lasers carry a high risk for relapse and the disease becoming more resistant to treatment, so require expert use.

## What is the outcome for melasma?

Melasma can be frustrating to treat, both for the patient and the medical practitioner. It is slow to respond to treatment, especially if it has been present for a long time.

Even in those who get a good result from treatment, pigmentation may reappear on exposure to summer sun.

The chronicity and risk for relapse with the need for lifelong sun protection should be emphasized to set realistic goals and outcomes.

Dr. Moenster and her team have hand-selected an extensive, medically-directed skin care protocol for your pre and post 3-Step Peel procedure. These products are science-based to improve your results as the ideal, at home skin care plan. We recommend you start this system 4-8 week prior and up to the night before your chemical peel procedure. You will resume this skin care regimen 3-5 days post-procedure, or as directed by your provider. See next page.



# Dermatology & Plastic Surgery of Arizona

## **MORNING**

### **Step 1: CLEANSE- Gentle Cleanser**

Apply a small amount of cleanser to damp face and massage in. Rinse face thoroughly.

### **Step 2: EXFOLIATE- Exfoliating Polish**

Apply a small amount to damp skin after cleansing. Gently massage in a circular motion, adding water as necessary for 30-45 seconds. Rinse thoroughly. Use 2-3 times per week for normal skin and daily for oily skin.

### **Step 3: TONE- Complexion Renewal Pads**

gently apply 1 complexion renewal pad to clean dry skin.

### **Step 4: Daily Power Defense**

Apply 2-3 pumps to face and neck to strengthen skin. Massaging into skin increases absorption, penetration, and stimulation.

### **Step 5: Pigment Control Creme**

Apply 2 pumps (1 gram) to affected area avoiding eyes.

**Step 6: UVA/UVB SPF 30+** Apply generously and evenly to exposed areas 30 minutes before sun exposure. Reapply every 1-2 hours as needed.

## **EVENING**

### **Step 1: CLEANSE- Gentle Cleanser**

Apply a small amount of cleanser to damp face and massage in. Rinse face thoroughly.

### **Step 2: TONE- Complexion Renewal Pads**

gently apply 1 complexion renewal pad to clean dry skin.

### **Step 3: Pigment Control Creme**

Apply 2 pumps (1 gram) to affected area avoiding eyes.

### **Step 4: Pigment Control Blending Creme + Tretinoin**

When using without tretinoin apply 2 pumps (1 gram) every night to affected area avoiding eyes.

If using with tretinoin use 1 gram of tretinoin and 1 pump of **Pigment Control Blending Creme** (mix equal parts). Apply mixture to affected area 1-2 times weekly increasing use of tretinoin to every other night and then every night as tolerated. You may experience some dryness, irritation, and peeling, which typically develops 3-7 days following the first application.