Haircoloring in the Salon

Developed by

Western Massachusetts Coalition for Occupational Safety and Health

Funded by

The Massachusetts Toxics Use Reduction Institute

HAIRCOLORING

- Types of Haircolor
- Haircoloring Processes
- Health Concerns
- Health and Safety Precautions
- Less Hazardous Product Alternatives

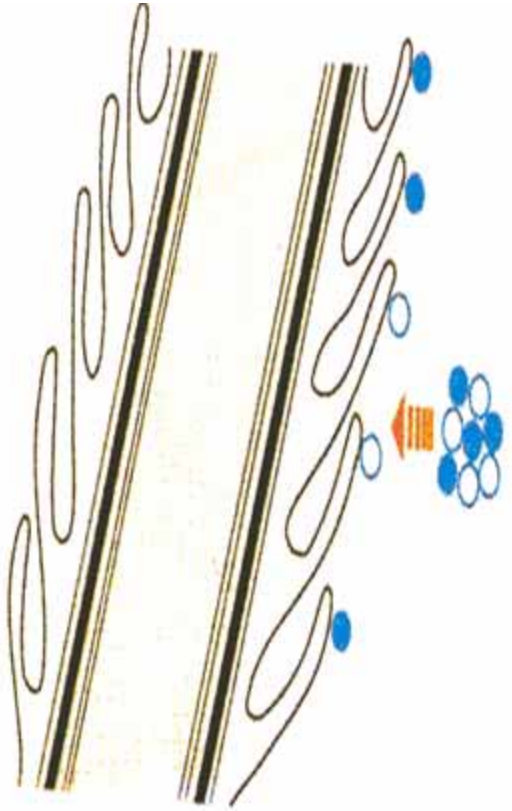
Types of Haircolor

- Temporary
- Semi-Permanent
- Demi-Permanent:
  - Oxidative Deposit - Only
- Permanent:
  - Non-Oxidative – Lift/Deposit
  - Oxidative

Types of Hair Color

1. Temporary

- ***Coats the outside*** **of the hair. Uses large molecules too big to penetrate the hair shaft.**
- **There is a physical action (*coating*) on the hair, not chemical action (*penetrating*).**
- **Does not lighten or change the structure of the hair.**



Milady's Standard – A Cosmetology Textbook, 2000

Types of Hair Color – *1. Temporary*

- **These are the least hazardous of all dyes. Uses food grade dyes approved by FDA. *Recently there have been non-certified direct dyes introduced into the market which may require a patch test.***
- **Spray-on temporary haircoloring that contain metallic salts can build-up and can cause adverse chemical reactions with future chemical services.**
- **These dyes are flammable.**

Types of Hair Color

2. A. Permanent
2. B. Semi-Permanent Hair Colors

Often both use Aniline Derivative Tints
from Para-Phenylediamines

Also known as:

- **Oxidation Tints**
- **Penetrating Tints**
- **Peroxide Tints**
- **Synthetic Organic Tints**
- **Para-dyes**
- **"Tints"**

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Chemicals of Concern

Permanent and Semi-Permanent Hair Dyes

- ***Para-Phenylediamines***
  - **Derivatives from coal tar**
  - **Darker dyes have more phenylediamine**

- ***Health Affects***
  - **Skin, eye, respiratory sensitizer**
  - **Severe allergies – e.g., facial and neck swelling**
  - **Dermatitis – e.g., rashes**
  - **Mutagenic when mixed with peroxide**

Types of Hair Color

2) A. Semi-Permanent - Traditional

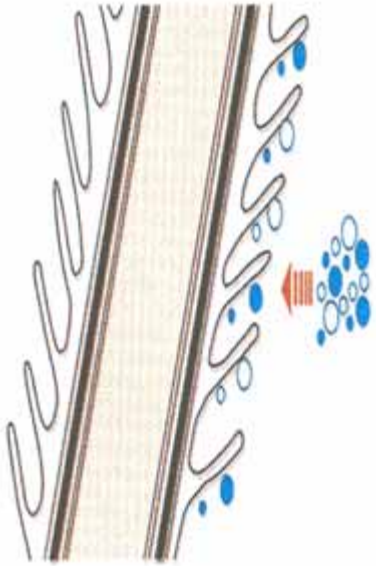
- **Uses a medium size molecule.**
- **Has a pH of 8.0 to 9.0 which causes a slight alkaline reaction to *swell* the hair shaft, causing the cuticle to *rise*.**
- **This allows some color molecules to *enter* the cortex, and some to *coat* the cuticle.**
- **A neutral or slightly acid after-rinse is used to stop the alkaline swelling reaction, allow the cuticle to close, and trap the color molecules inside.**

Types of Hair Color

2. A. Semi-Permanent - Traditional

Less damaging than permanent dyes since it does not lighten.

Causes a mild *chemical* and *physical change* in the hair shaft.



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Chemicals of Concern

Semi - Permanent Hair Dyes: Azo Colors

- **Derived from from benzidine, a known carcinogen.**
- **Can revert back to benzidine in the body.**
- **Azo Direct Black 38 and Direct Blue 6 are carcinogenic in their own right.**

Types of Haircolor

2) B. Semi-Permanent - Polymer

- **They are different than traditional semi-permanent dyes in chemical composition.**
- **They combine many molecules to form a chain called a *polymer*. Polymers *coat* the hair shaft rather than *penetrate*. They do not change the melanin.**
- ***Heat* is used to deepen the color penetration *rather* than the use of the *chemical oxidation* process.**

Types of Hair Color

3. Demi-Permanent (Oxidative Deposit-Only)

- **Process falls between the semi-permanent and permanent dye process.**
- **Uses a catalyst such as a 10% mild peroxide developer with a non-ammonia alkali to *swell* the cuticle, allow dye molecules to *penetrate* into the cortex and deposit color *inside* the hair shaft.**
- **A neutral or slightly acid after-rinse is used to stop the alkaline swelling reaction, allow the cuticle to close, and trap the color molecules inside.**
- **The mild chemical reaction does not lighten the melanin and hardly changes the hair structure.**

Chemicals of Concern

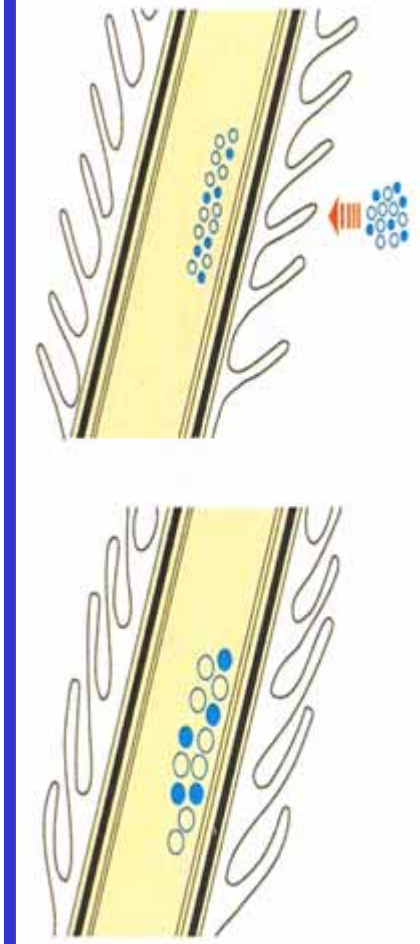
Demi-Permanent - Oxidative Deposit-Only

- **Uses mostly aniline derivative dyes.**
- **The alkali (high pH) used to swell the cuticle is from either monoethanolylamine (MEA) or amino methyl propanol (AMP).**
- **MEA is a pH adjuster that can release nitrosamines which cause cancer in animals and can cause severe eye irritation in humans.**

Types of Hair Color

4. Permanent - Oxidative/Lift Deposit

- **An alkaline reaction causes the cuticle to swell, allowing hydrogen peroxide and dye to enter.**
- **The hydrogen peroxide "*oxidizes*" (diffuses) the melanin, and "*lifts*" (lightens) the color.**
- **The hydrogen peroxide also causes the dye to "*develop*" and "*deposit*" color.**
- **A neutral or slightly acid after-rinse stops the alkaline reaction, allows the cuticle to close, and traps the color molecules inside.**



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Types of Hair Color

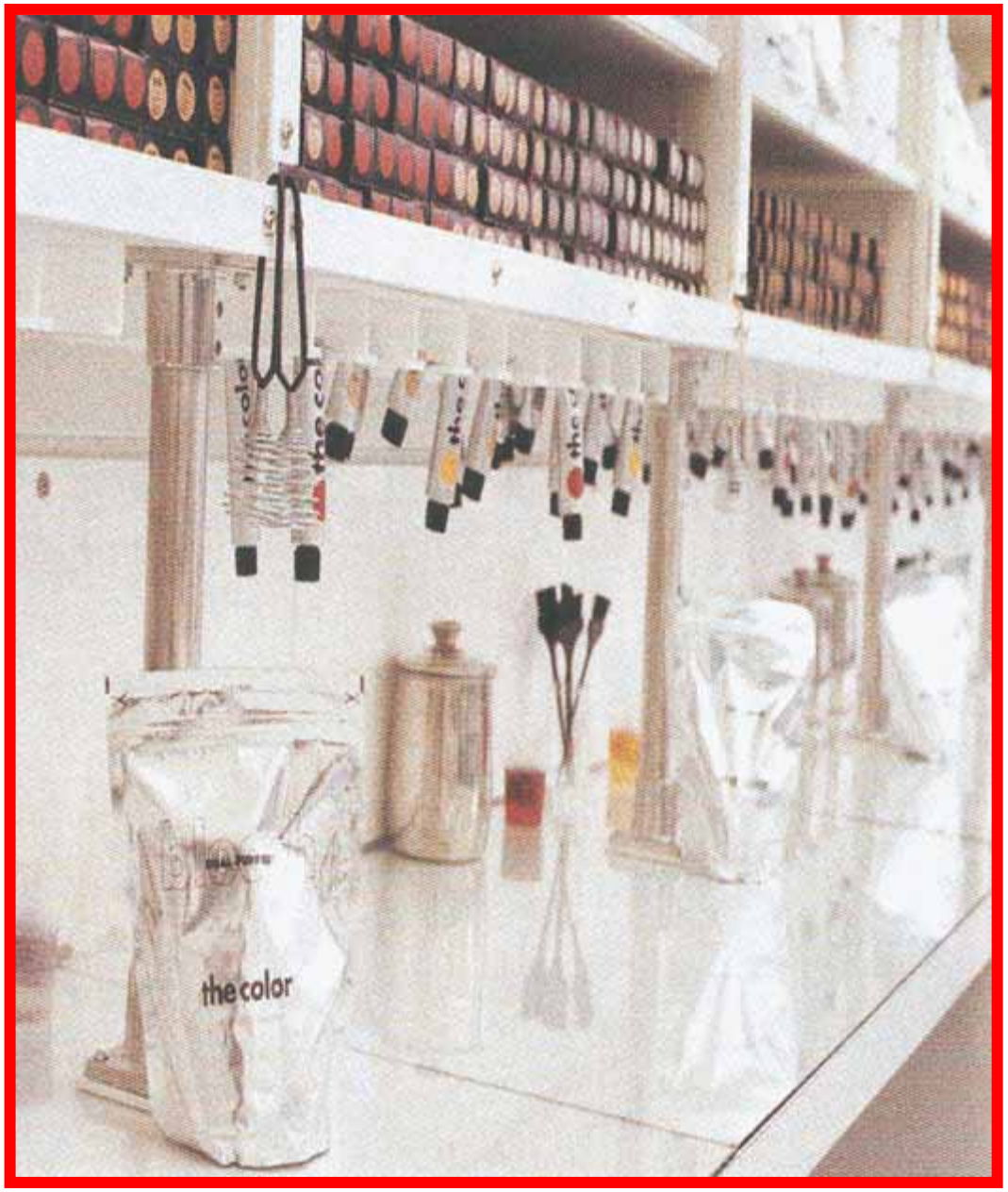
4. Permanent - Oxidative/Lift Deposit

- **Made from Aniline Derivative Tints.**
- **These haircolors have the smallest molecule which makes it easier for them to penetrate the hair shaft and the scalp.**
- **This process has the greatest impact on the hair structure, which is permanently changed, and the cuticle remains slightly shifted.**
- **Formulas can have ranges of:**
  - **Phenylediamine .08% to 6%**
  - **Hydrogen Peroxide 3 – 10% 20 – 40%**

Chemicals of Concern

Permanent Hair Dyes

- **Ammonia**
- **Resorcinol**



Types of Hair Color

5. Permanent - Non-Oxidative

Vegetable Tints

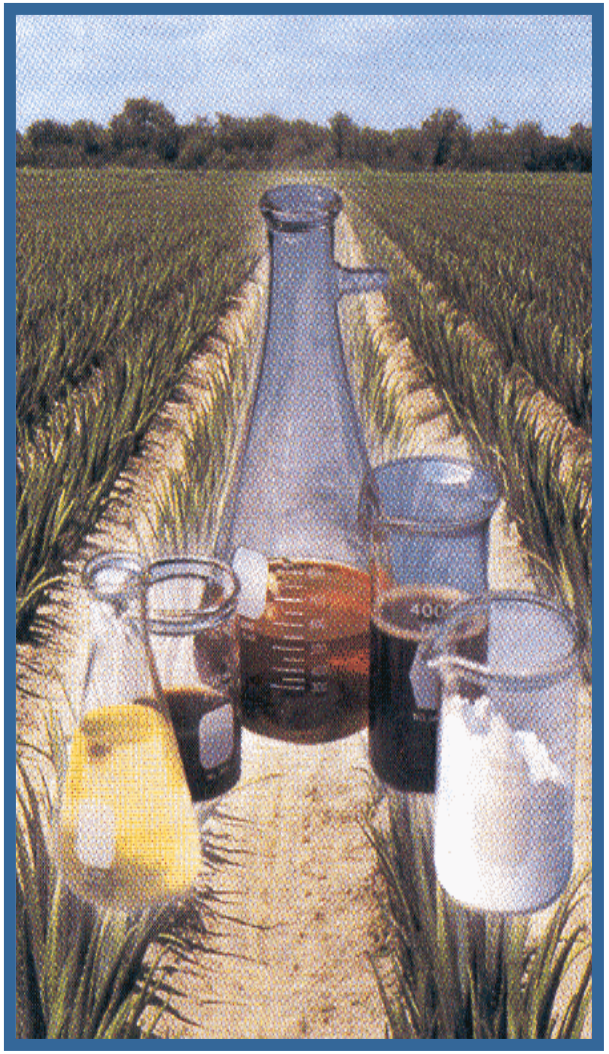
- Made from plant materials and henna
- Builds up layers in hair shaft

Metallic Dyes

- Contain metallic salts from lead acetate, lead, copper, cobalt, silver nitrate
- Not used professionally

Compound Dyes

- Mix of vegetative tints and metallic dyes
- Not used professionally



Problems With Metallic Dyes

Permanent - Non-Oxidative

- **Can cause headaches, scalp irritation, facial swelling, contact dermatitis, lead poisoning, and hair breakage.**
- **Swallowing dye can make you very sick and in some cases, kill you.**
- **Can buildup in hair and cause adverse reactions with the oxidation process in subsequent hair processing.**
- **Bottles of metallic dyes can explode.**

Problems With
Permanent - Non-Oxidative

Problems With Vegetable Tints:

Henna – can trigger asthma and other allergic reactions

Problems with Compound Dyes:

Henna and other vegetable tints can be combined with Metallic Salts

How Can the Haircoloring Products *Enter the Body?*

Through the Scalp into the Bloodstream

- **It has the richest blood supply in the body.**
- **It has the largest hair follicles in the body.**
- **It has a large number of sweat glands.**
- **It is a large surface area.**

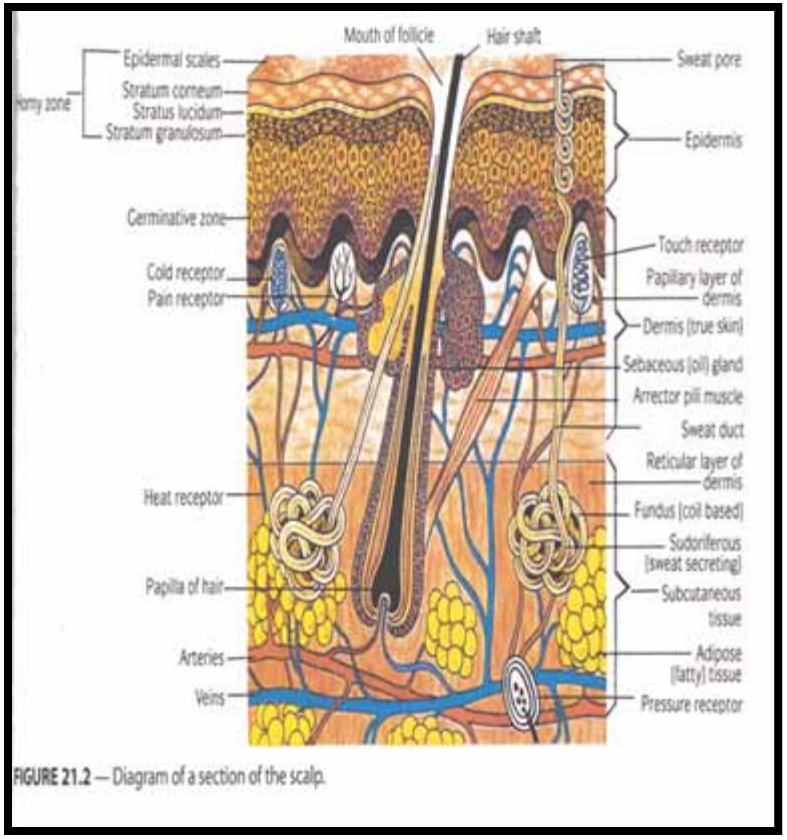


FIGURE 21.2 — Diagram of a section of the scalp.

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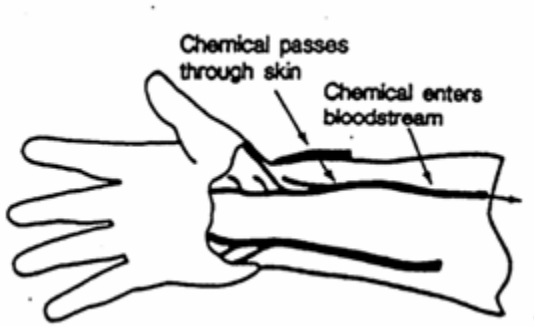
How Can Dyes *Enter the Body?*



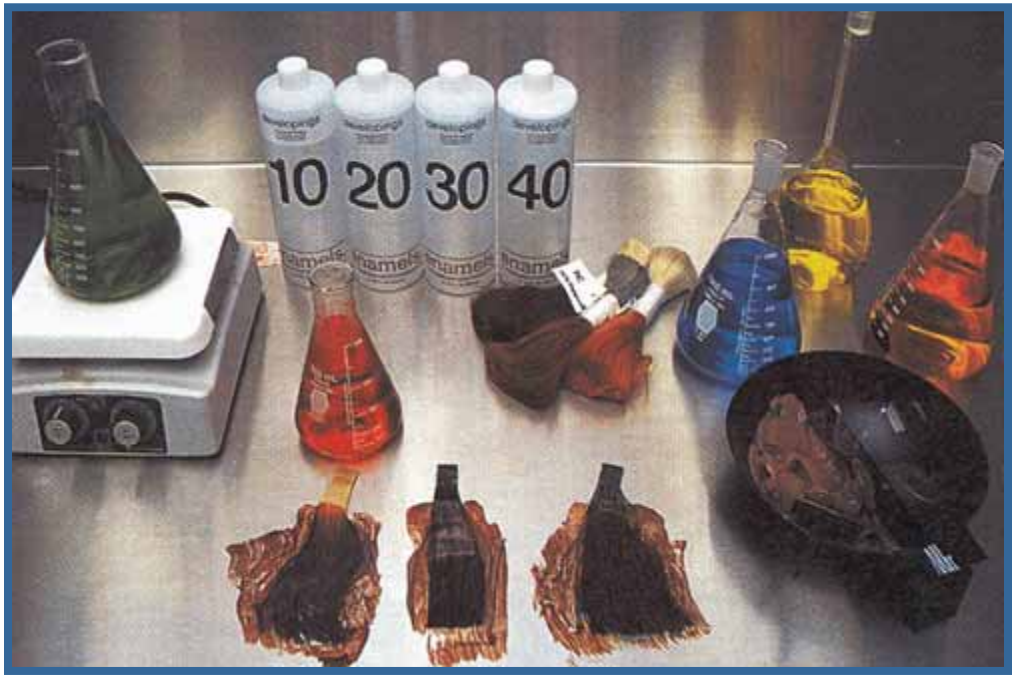
The absence of sebaceous glands and the horny surface of the hands makes them less able to absorb the dye molecules

Wear appropriate gloves during dye:

- **mixing**
- **application**
- **removal**

Nitrile gloves are the best and vinyl would be the next choice.

Protecting Your Respiratory System



Particulates

powder from:

dyes, henna, and other products to be mixed

Examining Your Client

- **Give *Patch Test* 48 hours before the dye service with aniline dyes.**
- **Examine scalp for abrasions, irritations, or eruptions.**
- **Perform a strand test.**

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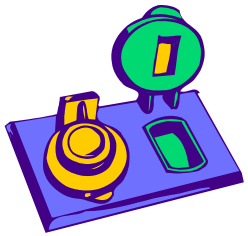
Preparing Your Client

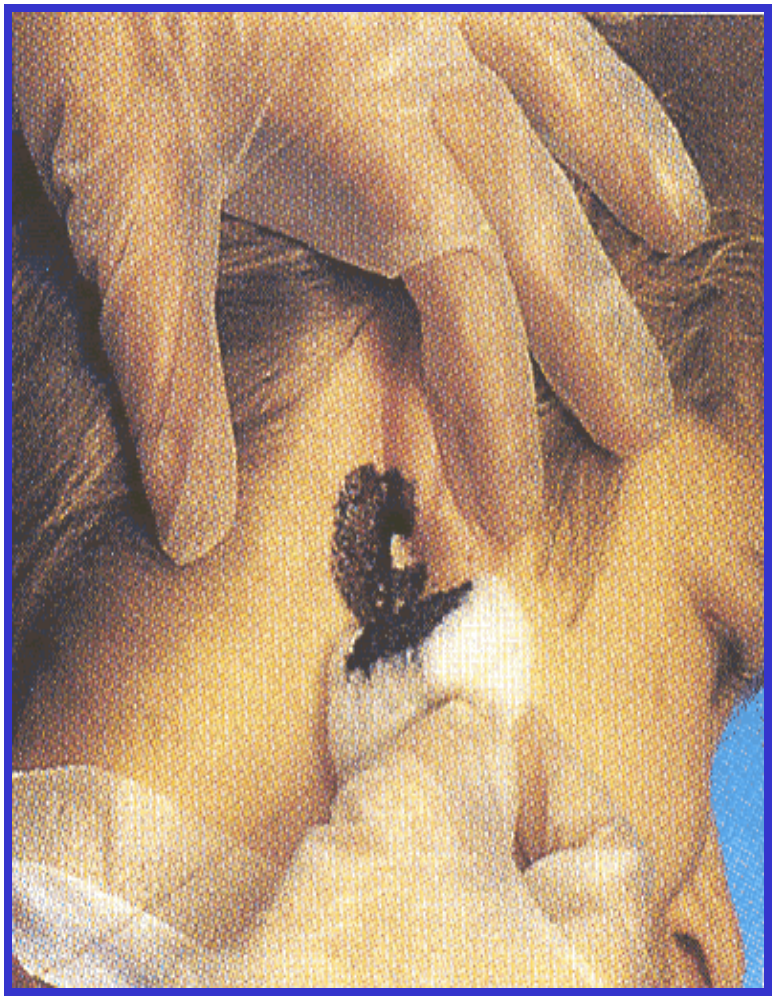
- **Ask client to remove glasses, contact lenses, necklaces and earrings.**
- **Give client a tint cape and a towel.**
- **Apply a barrier cream around hairline and over ears.**



Protecting Your Client

Do not use an aniline derivative tint if client has:

- **A positive patch test for allergy to aniline derivative tints.**
- **Scalp abrasions, irritations or eruptions.**
- **Contagious scalp disorders.**
- **Presence of metallic or compound dyes.**



Protecting Your Client

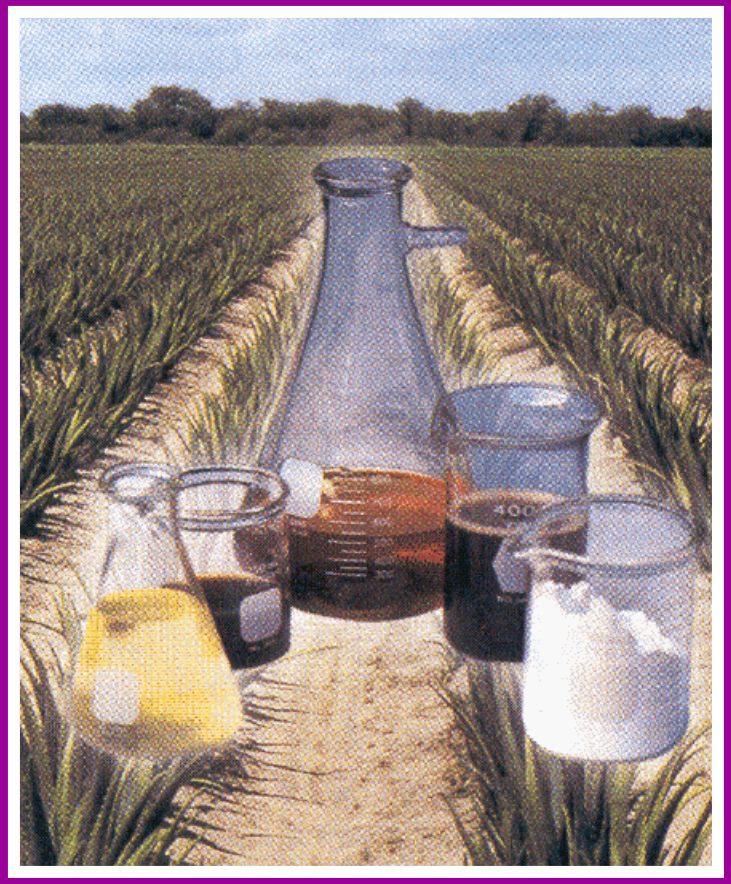
Aniline Derivative Tint Solution

Do not use on the eyelashes or the eyebrows, can cause blindness.

Alternative Products and Processes

- ***Try plant derived dyes:***
  - **Henna (triggers asthma)**
  - **Chamomile for lightening**
  - **Saffron**
  - **Beet juice**

- ***Use semi-permanent dyes without:***
  - **Ammonia**
  - **Resorcinol**



Alternative Coloring Processes

- **Try bleaching or blonding instead of dying darker.**

- **Highlight instead of dying entire head.**

- **Darken some gray hair.**