



## NAIL COSMETICS

The fingernail has been decorated since time began. The application of cosmetics to the nail represents an attempt to enhance its beauty. Unfortunately, the widespread use of cosmetics may result in unwanted reactions to them.

The functional role of the nail and its beauty depend on three main factors:

- The shape of the nail
  - Dependent upon proportion and contour
  - Artificial nails
    - Used to build up flat or concave nail plates
    - Creates illusion of a longer nail bed
- Its decoration
- Its texture as related to its consistency

The texture of the nail may be a function of its aesthetic appeal. It may become softened or more frequently brittle. Brittle nails are vulnerable to single or multiple longitudinal splitting and horizontal splitting into layers, occasionally leading to transverse breaking.

Nail coatings encompass two types:

- Coatings that harden upon evaporation; i.e. nail enamel, nail polish, or varnish
- Coatings that polymerize with four main types of artificial nail enhancements

Coatings are presented in several different ways:

- Liquid and powder - based mainly on functional methacrylate monomers cured via benzoyl peroxide, with the presence of quinone polymerization inhibitor.
- UV curable gel – usually based on urethane "acrylate" oligomer. Newer methacrylate-based

products are now available. Cure is obtained via UVA (320-400 nm) activation of a photoinitiator.

- Preformed artificial nails – limited by the need for some normal nail to be present for the attachment with cyanoacrylate instant glue. Artificial tips are the primary application of prosthetic nails.
- Wraps – based on cyanoacrylate resins, (moisture cure). Trace quinone-type polymerization inhibitor is also present. Amine-based spray or brush-on polymerization activator should be used.
- Sprinkle resins – based on cyanoacrylate resins (moisture cure). Trace quinone-type polymerization inhibitor is present, and it bonds instantly.

Reactions to nail procedures may be divided into two types of reactions:

- **Localized reactions** at the site of application to the nail itself
- **Ectopic lesions** (distant allergic contact dermatitis), where the hand transfers a small amount of nail cosmetic to other areas of the skin. The test battery enables us to distinguish allergic reactions from irritant reactions.

Unwanted effects from nail cosmetics include:

- **Evaporation coatings** – The eyelids, the lower half of the face, the sides of the neck, and the upper part of the chest are the areas most commonly affected by ectopic dermatitis resulting from evaporation coatings. Desquamative gingivitis, a sole manifestation of tosylamide/formaldehyde resin allergy, has also been reported. In addition to ectopic dermatitis, allergic airborne contact dermatitis caused by nail polish ingredients should be suspected when lesions on the face, neck and

ears are symmetrical and mainly involve the lower eyelids.

The allergen in nail enamel is usually thermoplastic resin. Nail polish dermatitis of allergic origin can appear on any part of the body accessible to the nails, but usually with no signs in the nail apparatus. Exceptions, however, may exist, mainly in the periungual area.

- **Color additives** – Coloring agents, such as organic colors, can be selected from a US Food and Drug Administration-approved list of certified colors. Inorganic colors and pigments may also be used but must conform to low heavy metal content standards. If the pigments are dissolved, rather than suspended in the polish with, for instance, stearalkonium hectorite, staining of the nail is more likely. Staining is most commonly yellow-orange in color. It begins near the cuticle and extends to the tip of the nail. After one week of continuous wear, the staining will fade spontaneously over two weeks after the enamel has been removed.

- **Nail keratin granulation** – Injury to the nail from nail lacquers is rare; however 'granulations' of nail keratin, presenting as superficial friability, can sometimes be observed. In these cases, individuals should continue to apply fresh coats of enamel over old ones for periods of weeks.

- **Coatings that polymerize**

- Sculptured nails – Allergic reactions to sculptured nails may occur 2 to 4 months, and even as long as 16 months, after the first application. The first indication is an itch in the nail bed. Paronychia, which is usually present in allergic reactions, is associated with excruciating pain in the nail area, and sometimes with paresthesia. The nail bed is dry, thickened, and there is usually onycholysis. The natural nail plate becomes thinner, split, and sometimes discolored. It takes several months for the nails to return to normal. Permanent nail loss is exceptional, as is intractable prolonged paresthesia.

Distant allergic contact dermatitis may affect the face and the eyelids, and is probably caused by touching the face with the hands. Patients who are allergic react strongly to the acrylic liquid monomer (1 to 5 % monomer in petrolatum or olive oil).

- Light-curing gels – Unreacted UV gel in the dust and filings can produce distant allergic reactions. Adverse nail reactions, even with nail loss and paresthesia, have been observed with photobonded acrylate.

- Preformed artificial nails – Artificial tips are the primary application of prosthetic nails. Preformed nails remaining in place for 3 to 4 days have some times caused mechanical onycholysis and nail surface damage. In some cases, allergic changes may be indistinguishable from dermatitis caused by formaldehyde nail hardeners. Ectopic allergic or irritant contact dermatitis may affect the face and eye lids.

- Nail mending and wrapping – Contact with ethyl cyanoacrylate-containing glue during nail wrapping may produce allergies, which present as periungual eczema that may be associated with eyelid dermatitis and features of nummular dermatitis, particularly over the dorsal hand.

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