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8 HR. TAKING CARE OF YOUR NAILS AND SPOTTING NAILS DISORDERS

TIMED COURSE OUTLINE:

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- HEALTH CARE AND THE NAILS
- NAIL BITING
- METHYL METHACRYLATE (MMA)

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- SCULPTING ON A FORM
- GENERAL MAINTENANCE PROCEDURES
- PINK AND WHITE MAINTENANCE
- FINISHING

LESSON OBJECTIVE:

Upon completion of this course, the student will be able to:

1. Define the anatomy of the nail.
2. Detect the relationship of health care and the nails.
3. Understand the underlying factors of nail biting.
4. Identify the dangers of Methyl Methacrylate (MMA).

5. Compile techniques, implements and equipment used in manicuring.
6. Generalize categories of nail cosmetics.
7. Point out the relationship of nail polish and eczema.
8. Relate the importance of hand washing.
9. Document the procedures for manicure table preparation.
10. Apply procedures for safe manicure and pedicure services.
11. Demonstrate foot manipulation techniques.
12. Understand safety rules for manicuring and pedicuring.
13. Relate the procedures for handling blood spills.
14. Outline the Sanitation Rules in compliance with the North Carolina State Board of Cosmetic Arts.
15. Define diseases and disorders of the nail.
16. Understand artificial nail terminology.
17. Generalize the chemistry of acrylic and artificial nail products.
18. Identify monomers and polymers.
19. Compile a listing of product types to make service choices.
20. Classify wrap fabrics and systems utilized in the salon.
21. Demonstrate the use of UV Gel Systems.
22. Apply safe practice procedures when servicing clients.
23. Outline a detailed understanding of the nail anatomy.
24. Explain the basic fundamentals of nail growth.

25. Generate answers to commonly asked questions about natural nails.
26. Analyze the relationship of nail services and allergic reactions to promote prevention.
27. Evaluate the dangers of MMA.
28. Develop a portfolio of manicure procedures utilized in the salon.
29. Relate the General Acrylic Nail Application Guidelines.
30. Follow general nail maintenance procedures for the pink and white of the nail.
31. Summarize finishing procedures to promote safe and sanitary services.

THE NATURAL CARE OF THE TIPS AND TOES

A professional manicurist defines a manicure as a cosmetic beauty treatment for the fingernails, hands, toenails, and feet. A manicure treatment can be just for the hands and feet, or both. Common manicure services include the filing and shaping of the nails, and the application of polish. There are also specialized manicure services particularly for the hands and feet. Soaking the hands in a softening substance and the application of lotion are common specialties for the hands. Another common specialty is applying this similar treatment of lotion to the feet,

called pedicure. The word "manicure" is derived from the Latin: Manus for "hand", and cura for "care".

Manicures often include the filing, polishing, and painting of the fingernails. A manicure may also include the application of artificial nail tips, acrylics, nail gels, or nail wraps. Some manicures include the painting of pictures and designs on the nails. Free-hand air brushing and the application of small imitation jewels are also common manicure services. Manicurists, while licensed in many areas, must follow regulation. Since skin is manipulated, and dead skin is nipped there is a certain risk of spreading infection when tools are used that are not properly cleansed and sanitized. This can cause disease to spread from one person to another, emphasizing the seriousness of sanitation.

Fingernails require 4 to 6 months for complete re-growth. Toenails require 12 to 18 months. Actual growth rate is dependent upon age, season, exercise level, and hereditary factors. Growth rates can show the history of recent health and physiological imbalances, and has been used as a diagnostic tool since ancient times. Major illnesses can cause deep horizontal grooves to form in the nails. The following nail deformities can indicate illnesses in other areas of the body:

- Discoloration
- Thickening
- Brittleness
- Splitting
- Grooves
- Mees' lines
- Small white spot
- Receded lunula
- Clubbing (convex)
- Flatness

Spooning (concave) Nutrient deficiencies, drug reactions, poisoning, or merely local injuries are contributing factors to the above deformities. Nails can also

become thickened (onychogryphosis), loosened (onycholysis), infected with fungus (onychomycosis), and also become degenerative (onychodystrophy).

When you see the hands you will also see the nails. The fingernails should not look chewed or yellowed. Every nail care product on the market is meant to beautify and enhance the nails. However, good nail care health can be also be enhanced by a healthy diet. Here is a list of things that would prevent the nails from being healthy:

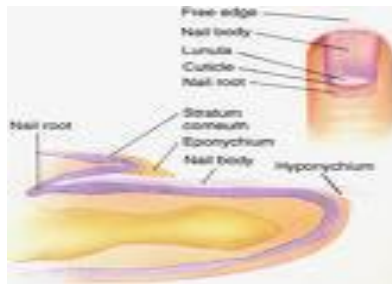
- A lack of Vitamin A and calcium will cause your nails to become dry and brittle.
- A lack of protein, Vitamin C and folic acid creates deficiencies that will cause hangnails.
- A white line across the nails could be an indication of protein deficiency.
- Red skin around the cuticles is a sign of poor metabolism of fatty foods.
- Cracked nails may indicate dehydration (person needs to drink more water).
- A lack of Vitamin B12 in its medicinal or food form can cause the nails to darken. This also contributes to dry and curved ends of the nails.
- A lack of zinc will cause white spots on the nails.

All of these conditions can be avoided by maintaining a balanced diet. The benefits of taking care of your nails are two-fold:

1. It will make your nails appear beautiful.
2. People will admire your beauty regiment.

Also, maintaining a healthy diet along with staying properly hydrated will mean benefits for your body as well!

A **nail** is a horny-like piece at the end of a human's or an animal's finger or toe.



- The **free edge** is the part of the nails that extends past the finger or toe beyond the nail plate. There are no nerve endings in the nails. This is the growing part of the nail still underneath the skin at the nail's proximal end.
- **Eponychium** or **cuticle** is the fold of skin at the proximal end of the nail. The eponychium attaches closely to the nail plate and moves with it as the nail plate grows. This extra growth of eponychium (cuticle) is generally freed and pushed back during a manicure. The eponychium's function is to act as a barrier seal to stop bacterial infections from getting to the matrix.
- **Paronychium** is the fold skin on the sides of the nail.
- **Hyponychium** is the attachment between the skin of the fingers or toes and the distal end of the nail.
- **Nail plate** is what we think of when we say nail, the hard and translucent portion, composed of keratin. The nail plate acts as a protective shield, shielding the delicate tissues of the underlying Nail Bed.
- **Nail bed** is the adherent connective tissue that underlies the nail.
- **Lunula** is the crescent shaped whitish area of the nail bed (when visible). The Lunula is often referred to as "moons". The lunula is the front end of the matrix. The whitish half-moons are keratin cells that have not yet been completely flattened and still have some of their content. The lunula regions are not always visible. The lunula is normally more prominent on the thumbs. The shape of the lunula determines the shape of the free edge/distal edge.
- **Nail fold** is a fold of hard skin overlapping the base and sides of a fingernail or toenail. As mentioned previously, the nail folds protect the matrix. The Proximal Nail Fold and the Lateral Nail Folds are part of our skin. The skin does not just end there; it folds at the edges and continues beneath soft tissue. This continuing skin acts as a protective barrier; it protects and seals the matrix against bacteria and dirt.

- The **matrix** is the ROOT of the nail. This area is not visible; it is hidden and protected by the Proximal Nail Fold. The matrix produces keratin cells that make up the nail plate. As more and more cells are produced the older ones are pushed outwards and flattened, all this pushing and flattening results in the cells losing their original white plumpish appearance. They eventually become a transparent part of the nail plate.
- Apart from producing the **keratin cells** that make up the nail plate, the matrix also determines the shape and thickness of the nails. The overall length of the matrix will determine the thickness of the nail; so the longer the matrix the thicker the nail. A short matrix produces fewer cells, as a result a thinner nail. Matrix shapes and sizes vary per person, a flat matrix will produce a flat nail and a curved matrix will of course produce curved nail.

Health and Care

Like skin, nails can dry out. They can also become infected. Toe infections can be caused or exacerbated by dirty socks, specific types of aggressive exercise, tight footwear, and walking unprotected (without footwear) in an unclean environment. Manicures and pedicures are health and cosmetic procedures used to groom, trim, paint the nails, and manage calluses of the hands and feet. They require various tools such as cuticle scissors, nail scissors, nail clippers, and nail files. Infections can also be caused by nail salon implements which are not properly sanitized. Regarding nail tools such as files, "if they're used to service different people, these tools may spread nail fungi, staph bacteria, or viruses". In fact, over 100 bacterial skin infections in 2000 were traced to footbaths in nail salons. To avoid this, it is good to clean and sanitize implements. (Using cuticle removers in gels and creams instead of cuticle scissors) will also help control bacteria.

Nail Biting



Nail biting often indicates internal tension, stress, boredom, hunger, or it may simply be a habit. Biting the nails can result in the transportation of germs that are buried under the surface of the nails into the mouth.

Nail biting has its origins in a nervous condition, a condition that was probably developed when growing up, but triggered later because of a certain event. Some doctors say that until you have dealt with that event you can't let go of the nail biting habit. Therefore, it is important to know the reason why people bite their nails in order to solve the issue.

Most nail biting cases start during childhood and become a habit, and a problem, into adulthood. After becoming uncontrollable, the need of getting rid of the habit arises. If the nail biting habit is based on a nervous condition, it is best to treat the condition instead of the nail biting habit first. In some cases, a psychologist may explore your past in an attempt to find the answers that contribute to this habit. During this process, you may be surprised to find out things about yourself that you did not even consciously remember.

This treatment can take some time, but you can still take some action in order to avoid biting your nails. Let us look at a few ways:

- Try to keep your hands occupied.
- Hold an object that fits in your hand when you feel the urge to bite your nails. This will help you to avoid anxiety build up.
- If you are a woman you can use polish or nail paint.

- Another simple way is use a stretchy band around the wrist. This will help you as a reminder of your resolution to stop nail biting.
- You can try nail-biting products made to stop nail biting. These products are applied on the nail surface and leave a bad taste in your mouth.
- Stress plays an important part in the habit of nail biting, so you may be interested in finding ways to cope with stress. You may find it useful to set up a stress management plan.
- Final tip: Stay focused on the present. This practice will help you with any situation in life. As a result, you will notice when you start putting your fingers in your mouth and can avoid it if you do not have other tools at hand.

PROHIBITED PRACTICES: It is illegal according to the Law & North Carolina Cosmetic Arts examiners regulations for this product to be located any where in a salon

METHYL METHACRYLATE



Methyl Methacrylate - MMA for short. MMA has been prohibited for use in the nail industry since the late 70's. One of the most controversial topics in the professional beauty industry involves a monomer liquid called MMA or methyl methacrylate. Unfortunately, there are many myths and misunderstandings

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surrounding the use of this ingredient. Most practitioners know they should not use products containing this ingredient, but they do not know why! Generally, when you ask someone why MMA should not be used, the immediate response is normally that MMA is toxic. Although it is true that you should not drink MMA liquid, the same holds true for salt water and rubbing alcohol. Then why should MMA not be used? There are four main reasons:

1. **MMA nail products do not adhere well to the nail plate.** To make these products adhere, nail technicians often shred up (etch) the surface of the nail. This thins the nail plate and makes it weaker.
2. **MMA creates the hardest and most rigid nail enhancements,** which makes them very difficult to break. When jammed or caught, the overly filed and thinned natural nail plate will often break before the MMA enhancement separates from the nail surface, leading to serious nail damage.
3. **MMA is extremely difficult to remove.** Since it will not dissolve in product removers, it is usually pried from the nail plate, creating still more damage.
4. **The FDA says do not use it!** This is clearly the most important reason. The FDA bases their prohibition on the large number of consumer complaints resulting from the use of MMA nail enhancements in the late 70's and they continue to maintain this position today.

For these reasons, the Nail Manufacturers Council and the American Beauty Association have also taken a stance against the use of MMA liquid monomer as an ingredient in artificial nail liquids. Not only is MMA toxic, it is also an unsuitable ingredient for proper nail care. MMA is a widely used monomer with a long history of safe use in medical and dental products. It is fine for making bulletproof windows and shatterproof eyeglasses. However, we believe that artificial nails should not only be beautiful, they should not damage the natural nail. They are

enhancements, not replacements! We also believe it is the responsibility of all professional nail technicians to protect the health of their client's natural nails. A good rule of thumb is to start by using responsible formulated products, and learning safe, and proper techniques for enhancing the natural nails.

EMA or Ethyl Methacrylate. What is the difference? The following is an explanation of the differences between MMA liquid and EMA liquid form.

Chemically speaking, sometimes a very small difference in a molecule's structure can make a big difference in its effects. **Ethyl methacrylate** (EMA) has a slight, but significant, difference in molecular structure from MMA that makes EMA much safer to use. More specifically, EMA has a carbon atom and two extra hydrogen atoms compared to MMA. This may not seem like much, but the effects are large.

An analogy is the difference between Methanol (wood alcohol) and Ethanol (beverage alcohol). As with MMA versus EMA, the difference between the two is just one carbon and a couple of hydrogen atoms; yet one is a deadly poison and the other is safe if used moderately.

Research has shown that MMA is strongly sensitizing with a high potential to damage nails and surrounding tissue. Some people may use it and be OK, but that is just luck. Because many people were harmed by MMA, the FDA prohibited the material from nail use two decades ago.

EMA has a somewhat larger molecule, and is less able to penetrate body tissue. Many years of salon experience indicate that this material is safe for most people. Of course, just as with any food, drug or cosmetic, there are always going to be people who may have an allergic reaction to it. In addition, long-term overexposure to ANY acrylic - even odorless or gels - can cause sensitivity to gradually develop.



This is why EMA, and all acrylic or gel products, should only be applied by trained professionals who can minimize the skin exposure that a client experiences.

In the early 1970s, FDA received a number of complaints of personal injury associated with the use of fingernail extenders containing methyl methacrylate monomer. Among these injuries were reports of fingernail damage and deformity, as well as contact dermatitis. Based on its investigations of the injuries, and discussions with medical experts in the field of dermatology, FDA concluded that liquid methyl methacrylate was a poisonous and deleterious substance that should not be used in fingernail preparations. The agency chose to remove products containing 100 percent liquid methyl methacrylate monomer through court proceedings, which resulted in a preliminary injunction against one firm, as well as several seizure actions, and voluntary recalls.

Although there is no specific regulation prohibiting the use of liquid methyl methacrylate monomer in cosmetic products, FDA continues to believe that this substance, when used in cosmetic fingernail preparations, is a poisonous and deleterious substance.

How do you know the salon or technician is using MMA?

- MMA has an unusually strong or strange odor, which does not smell like other acrylic liquids. Odor is present during application and when filing cured product (for fill-ins or repairs).
- Enhancements that is extremely hard, and very difficult to file, even with coarse abrasives.
- Enhancements that will not soak off in solvents designed to remove acrylics.

- Cloudy or milky color when cured.
- Nail enhancement that do not lift in a two-week period.

Additional warning signs:

- Low price of fills and full sets (MMA cost 1/3 of EMA)
- Dust or ventilation masks used (many technicians use dust masks today who do not use MMA)
- Unlabeled containers - technician will not show or tell the client what brand of product is being used

IN PART THE USE OF MMA HAS BEEN PROHIBITED IN NORTH CAROLINA SALONS

MANICURING

Professionally, it is imperative that you develop competence in working with the tools that are required for nail care. These tools can be grouped into four basic categories: equipment, Implements, nail cosmetics, and materials.

Implements and Equipment

Equipment consists of the permanent tools you will be using to perform nails services. They do not require replacement unless they are no longer in good condition.

A manicure table refers to a piece of furniture that is used for giving a manicure. A manicure table, just like any other kind of table, has a flat, horizontal surface that is supported by four legs. A manicure table, unlike other ordinary tables, is

characterized by a lot of compartments and storage spaces. It is structured to make manicuring easier.



A good manicure table has an exhaust fan. This usually works best in nail and beauty salons, where the smell of chemicals inside the salon can irritate customers. An exhaust fan drives away unpleasant odors coming from the manicure procedure.

A manicuring table has many drawers in it. The cabinets are used as storage spaces for the manicure sets, and supplies. This is also a tool to organize the manicure implements. For example, the nail clippers, emery boards, and pushers should not be mixed with nail polish, and cuticle removers, as well as other liquid-based manicure supplies.

Some manicure tables have a nail tray on the surface to accommodate all the nails that are cut. Without this, a manicurist will have to look for the little pieces of cut nails scattered around. A nail tray is an easy way for salons to practice cleanliness and proper sanitation.

An electric dust extraction is also included in manicure tables of good quality. When giving a manicure, a lot of dust flies in the air. The dirt from the nails and the cuticles alone has to be eradicated. An electric dust extraction is a device that absorbs all of this for sanitation purposes.

Manicure table with adjustable lamp: Most standard tables include a drawer to store equipment and cosmetics. Some tables come with an attachment, adjustable lamp with a 40-watt bulb. The heat from a higher wattage bulb might interfere with the manicure, or other advanced nail procedures. A lower wattage will not be warm enough to warm a client nails if the room is cool.

- **Nail technical chair and client chair:** These should be selected for the value of ergonomics, comfort, and durability.



- **Supply Tray:** This tray is used for holding cosmetics such as polishes, polish removal, and creams. It should be durable, balanced, and easy to sanitize.

-**Finger-bowl:** This bowl is designed for fingernail care by soaking the client's finger in warm water with liquid soap added. It is also used to soften the cuticles in warm water. You can use a professional finger bowl that is contoured to your hand, or a normal glass bowl. It is generally made of plastic, china, or glass so that it can be easily sanitized.



-- **Containers:** These are used for holding clean absorbent cotton, or organic cotton. Organic cotton is cotton that has low impact on the environment.



-- **Electric Heater:** Used for heating oil when giving a hot oil manicure.



Disinfectant-container: This is an important piece of equipment. It must be large enough to hold a disinfectant solution in which all equipment requiring sanitation can be completely submerged.



Implements

A manicure set refers to a collection of tools that are used to give a manicure. Using a good set of manicure tools makes a good manicure.

Implements are instruments or tools that should be disinfected, sanitized, or disposed of after use with each client. They are small enough to fit in the disinfectant container. The following is a list of tools you need for most services.

-Cuticle Nipper: Small cutting tool used to nip excess cuticle at the base of the nail.



-Cuticle Pusher: Implement used to loosen, and push back the cuticle around the fingernails, and toenails. It is shaped to conform to the shape of the nail.



-Emery Board: Disposable manicuring instruments with rough cutting ridges, used for shaping the nails with the coarse side, and for smoothing them with the finer side.



Emery boards are pieces of cardboard which have emery, or emery paper glued to them, making them both abrasive, and flexible, used for fingernail, and toenail care. They are used by manicurists to shape and smooth the nail during manicure, and pedicure sessions. Emery boards are inexpensive, and disposable, making them a sanitary alternative to metal nail files.

-Nail-Brush: Small brush used to clean under and around the nails, with the aid of warm water and soap, this implement is reusable.



-Nail-Buffer: Instrument made of leather or chamois, used with polishing powder to polish the nails to a high luster.



- Nail Clippers - Implement used to shorten the nails. If your client's nails are very long, clipping will reduce the filing time.



-Nail File: An instrument with a specially prepared surface to file, and shape the nails.



Orangewood stick: Stick made from the wood of the orange tree, used to loosen the cuticle around the base of the nails, or clean under the free edge.



- Tweezers: Implement used to lift small bits of cuticle.



SANITATION FOR IMPLEMENTS



It is a good idea to have two complete sets of metal implements so you will always have a completely disinfected set ready for each client, with no waiting

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time between appointments. If you have only one set of Implements remember that it takes approximately 10 to 20 minutes to sanitize implements after each use.

Disinfectants are chemical agents used to destroy most bacteria. Viruses are also destroyed from implements and surfaces that are disinfected. Disinfectants are not for use on human skin hair, or nails. "Disinfectants should never be used as hand cleaners". Any substance powerful enough to quickly and efficiently destroy pathogens can also damage the skin.

Wash all implements thoroughly with a clean disposable towel. Metal implements should be completely immersed in a container filled with an approved disinfectant; all disinfectant must be approved by the Environmental Protection Agency of each individual state.

To meet salon requirements a disinfectant must have the correct effectiveness to be used against bacteria, fungi, and viruses. It must also be pseudomonacidal (effective against bacteria) in addition to being bactericidal, fungicidal, and virucidal. If a disinfectant has been tested for additional organisms such as HIV-1, it will be stated on the label. For blood born pathogens, OSHA issued a policy in 1997. This policy states that in order to comply with OSHA'S blood borne pathogens standard, the use of an EPA registered tuberculocidal disinfectant, or an EPA registered disinfectant labeled as effective against HIV, and HBV is required. For this reason, when salon implements accidentally come into contact with blood, or body fluids they should be cleaned. Implements must be completely immersed in an EPA- registered disinfectant that kills HIV-1 and, the Hepatitis B virus, or in a tuberculocidal disinfectant.

Follow manufacturers' instructions for the required disinfection time. Product labels should explain what the disinfectant test results are. To meet salon requirements, a disinfectant must have the correct effectiveness to be used

against bacteria, fungi, and viruses. Dry the implements with a clean or disposable towel when you remove them from the disinfection container.

In addition, place the implements in a clean dry closed container for the next use.



Nail Cosmetics:

It is important for nail professionals to become knowledgeable of nail cosmetics, and what ingredients they contain. It is important that the practitioner know how to apply each cosmetic, and when to avoid using a product because of client sensitivities. Here are some of the most important nail cosmetics:

- **Antiseptic**-Used to prevent infection when there are major injuries to tissues surrounding the nails.
- **Base coat**- Colorless liquid applied to the natural nail before the application of colored polish. Allows the nail polish to adhere readily to the nail surface, forms a hard gloss, which prevent the colors in the nail polish from staining the nail plate.
- **Cuticle Cream**- Creams that usually have a base of lanolin, petroleum, and beeswax. This cream helps prevent or correct brittle nails, and dry cuticles. It is suitable for use on a daily basis.
- **Cuticle Oil**- This oil is used to soften, and lubricate the cuticle around the fingernails, and toenails.

- **Cuticle Remover**- This is used to soften, and remove dead cuticles from the nail.
- **Dry Nail Polish**- This is used to add shine to the nails.
- **Hand Lotion**-This is used for dry, chapped, or irritated skin. Hand lotions are made up of emollient, and humectants. These ingredients add the finishing touches to a manicure. Hand lotion can be used as oil in a hot oil manicure.
- **Liquid Nail Polish**-Thick liquid is used to color gloss the nail. It is a solution of nitrocellulose. This chemical is such a volatile solvent that it is mixed with a plasticizer, such as castor oil, to prevent too rapid drying. Resin and color are also present. In addition to the finished nails appearance, the purpose of the polish application is to rebuild layers allowing for adhesion, and staying power. Always keep the polish thin enough to flow freely. If the polish is thick, add a little polish solvent, and shake well.
- **Nail Bleach**-This product is used to remove stains and whiten the nails.
- **Nail Conditioner**-Products that contain moisturizing ingredients to combat dryness, and brittleness. It is used separately from a manicure, usually overnight, or on clean dry nails.
- **Nail Dryer**-This solution protects the nail polish against stickiness, and dulling. It can be used either as a spray, or brush on, and is applied over the top coat, or directly on the nail polish.

Nail Polish



Nail lacquer includes enamels and, topcoats together or separately. The base coat is used to improve bonding of enamel. A top coat improves the depth, and luster of the enamel. This helps to prevent chipping, and abrasion. Nail polish is made up of six groups of chemicals.

1. **Cellulose file formers**-(nitrocellulose) these add gloss to the nail.
2. **Resins**-Toluene sulphonamide formaldehyde resin improves gloss and adhesions to the nails.
3. **Plasticizer**-Dibutylphthalate gives flexibility and plasticizes the cellulose.
4. **Thixo tropic suspending agents-bentonite**. These keep pigments in suspension after shaking the polish.
5. **Solvents**-Butyl and dilnents (toluene) keeps nitrocellulose, resin and plasticizer in a liquid state and control the application and drying time.
6. **Color substances**. These could be inorganic or organic colors.
"Pearls" or "frosts" are due to bismuth oxychloride and titanium dioxide coated with mica and guanine.

Reaction due to nail polish

NAIL POLISH & ECZEMA

Eczema may appear on any part of the body that can be reached by nails. While skin around the nails may not be affected, the eyelids, face, neck and chest are among the first areas with noticeable eczema that may be associated with nail polish contact. Toluene, a colorless liquid aromatic hydrocarbon used in dyes and explosives, is the most common culprit. Sometimes nickel pellets are also used in nail polish. This chemical can cause an allergic reaction in people who are allergic

to nickel. Nail plates can be stained due to use of nails polish. This starts near the cuticle (the base of the nail), and slowly moves forward.



Acetone is a solvent that is used for soaking, and removing acrylics. It can cause drying of the nail plates, and soreness of the nail folds. Use of this product can also cause thinning and splitting of the nail.

Nail "Hardness"

Nails can be hardened by substances including formaldehyde preparations. This chemical can contribute to bleaching under the nail, and bluish discoloration of the nails.

"Stick-on" nail polish a small colored synthetic film with adhesive is used, which sticks to the nails. Adverse effects include flaking, roughness, broken nails, and disappearance of the cuticle.

Nail Wrapping



This is used if the free edge of the nails is repeatedly splintered. The free edge of the nails is cemented with cotton wool, paper, or plastic film. Afterward, the nails are fixed with nitro cellulose glues. The procedure needs to be repeated every two-weeks.

Cuticle Remover



Most of these products contain sodium potassium hydroxide, or quaternary ammonium urea. The manufacturers' instruction should be strictly followed otherwise irritation can occur. This product is used to loosen cuticle around the nail.

Nail Cream:



This is a water, and oil moisturizing cream with low water, and high lipid content. It can be used to prevent brittleness.

Nail Buffing:



This is done to remove small particles of nail debris, and to increase the luster, and smoothness of the plate.

Nail Hardener or strengthener



This product is designed to prevent nails from splitting, or peeling. This product is applied before the base coat. The nails must be thoroughly clean, free from oil or cream, and dried. There are three types of hardeners: Proteins formaldehyde and Nylon Fiber from formaldehyde hardeners. The nylon fiber utilizes keratin fibers to strengthen the nail, and contain no more than 5 percent formaldehyde. A nylon fiber mixture of more than five percent could damage the nail. Nylon fiber is applied first vertically, then horizontally, on the nail plate.

Polisher remover



A solvent used to dissolve, and remove nail polish. To offset the drying action of the solvent, oil is normally an added ingredient in the nail polish remover. Use non-acetone polish remover for clients who have artificial nails. Acetone can weaken or dissolve tips, warp glue, and sculpture the nail compound.

Polish Thinner



Products used to thin out nail polisher when it thickens; contains acetone, or some other solvent.

Used as a top coat-liquid, it is colorless nail enamel used to protect the polish, prevent chipping, and imparts a high gloss.

Materials

Materials are supplies used during a service. Some materials cannot be reused on a client and must be discarded after each use. Materials include the following:

- **Absorbent cotton, cotton balls, or cotton pledgets-** for application of cosmetics to the nails.



- **Approved solution for jar sanitizer**-This is where implements are kept during a manicure. (Should be changed daily)



- **Chamois**- For replacing solid chamois or buffer (if allowed in your state or province).



- **Cleanser for finger bath** (liquid or other form).
- **Cleansing Tissue**-For use whenever necessary.



- **Plastic Bag-** must be inside of a small close lid trash can and is used to discard items.

- **Plastic cup-** For use in oil manicure heater.



- **Plastic Spatula-** For removing cream from jars.



- **Powered Alum or alum solution-**Aluminum salt used as a styptic (agent used to stop bleeding).

- **Terry Cloth Towel-**Fresh for each client.



- **Trash Container**-Should have a lid that can be opened with a foot pedal. Should be lined and kept closed when not in use. (Should be Empty at the end of each day.)



Before you get started with any manicuring procedure, you must first wash your hands.

Washing the Hands

Hand-washing is one of the most important actions that can be taken to prevent the transfer of microorganisms from one person to another. Hand washing removes microorganisms from the folds, and grooves of the skin by lifting, and rinsing them from the skin surface. In the salon hands should be thoroughly

washed before, and after each service. After washing your hands in a public restroom, avoid touching items such as bar soap, towel dispensers, and doorknobs. Use a paper towel to turn the doorknob when leaving the restroom. This way you avoid contaminating your clean hands with any microorganisms. At the end of the day, wash your hands to prevent carrying microorganisms outside of the salon.

Soap and warm water are generally sufficient for hand-washing. On other occasions, some antibacterial soap can kill microorganisms in deeper layers of the skin than plain soaps, and detergents. When overused, however, the relatively harsh, drying action of antibacterial soaps may actually leave the skin vulnerable to skin problems such as eczema. Alcohol-based no-rinse products designed for use without water are also very drying to the skin.

The correct procedure for washing the hands consists of these steps:

1. Wet your hands with warm water.
2. Using liquid soap, scrub your hands together and work up a good lather for 15-20 seconds. Give particular attention to the areas between the fingers, the nails, both sides of the hands, and the exposed portions of the arms.
3. Rinse the hands well with warm water.
4. Dry your hands using a disposable paper towel or air blower.

Do not use cloth towels unless they are dispensed for individual use. Antiseptics can kill, retard, or prevent the growth of bacteria. However, they are not classified as disinfectants. Antiseptics such as three-percent solutions of hydrogen peroxide are weaker than disinfectants and are safe for application to the skin (usually used prior to a manicure, or pedicure). They are considered sanitizers, and are not adequate for use on instruments and surfaces.

Drainage for Implements



It is a good idea to have two complete sets of brass instruments completely disinfected, and ready for each customer. This routine will help to avoid down time between clients. If you have only one set of implements remember it takes approximately 10 to 20 minutes to clean them after each use.

The Manicuring Table

A messy manicuring table creates a bad impression. Seeing a neat table will help your client feel confident about your abilities. Everything: containers, bowls, instruments, and materials must be in perfect order. Everything you will need during a service should be at your fingertips. When giving a professional manicure, all the rules of sanitation and disinfection must be followed. Disinfect manicuring implements after each use. Do not ask the client to sit at the table with the remains of the previous manicure. Always clear the table immediately after the completion of one manicure so that it will be ready for the next client. This will make the manicure more pleasant for the client and will put her in a more receptive mood for your advice, and suggestions.



As a professional nail technician, you will follow a three-part procedure for all services you perform. This sequence includes a pre-service function, the actual procedure, and a post services function.

During the actual manicure procedure, discuss with your client the products you are using and suggest that those products be purchased in order to maintain the nails, and skin between appointments. Before applying polish, ask your client to replace jewelry, locate keys, pay for the service as well as any retail products, and put on any outer clothing such as sweaters or jackets. This decreases your client's chances of smudging the polish once the service has been completed.

Before you perform a service on a client, you should take some time to talk with the client. Complete a client health record, and a service and product record. During this consultation, you should discuss the general health of your client's nails, and their lifestyle needs. If the client has a nail disorder that prevents you from performing a service, you should refer the client to a physician. Offer to perform a service as soon as the disorder has been treated.

A consultation has two parts:

1. The analysis:

During the analysis process, information is gathered by asking questions, looking closely at the client's skin and nails, and pointing out their texture and moisture content. Other factors involved, include coloration, and the client's health condition. Ask relevant questions concerning the client's lifestyle. Ask what goals the client has in mind for their nail service.

2. The recommendations during the analysis process:

The recommendation process is offered only after analysis has been completed. When you know the client's goals, you can then make recommendations for the appropriate service. Explain the benefits and results of the service, and recommend home-care products with instructions on how and when they are to be used.

The consultation is the first opportunity to portray yourself as a professional to your client. It should be performed in a straightforward and confident manner, you will need to:

1. **Focus on the client.**

2. **Look at the client directly while speaking in a tone that demonstrates**

integrity and confidence.

3. Support your recommendations with facts and information.

4. be friendly and helpful.

A well- handled consultation will help establish you in the eyes of the client. It demonstrates the difference between being a professional and just performing a service.

Discussing the client's General Health



To safeguard your client, you should ask relevant questions concerning his/her general health. Always read the complete health record so that you will be alert to precautions you must take during services. For example, be particularly careful while filing the nails or pushing back the pterygium (forward of growth of cuticles) of a diabetic client, and never nip the cuticles. Diabetics heal slowly and easily get infections that do not heal quickly, and sometimes not at all. The damage can be deadly if the skin is cut or scraped.

Clients with arthritis should have their hands held gently during the service.

Clients who have a circulatory disease, such as varicose veins, should be manipulated very carefully. It is the responsibility of the technician to seek out information that will ensure the health of all clients.

Choosing Nail Shape



Before you begin to work on a client's nails, both you and the client should agree on which nail shape is desired. Nails are usually classified into five general shapes:

square, squoval (square with rounded edges), round, oval and pointed. Keep in mind the following considerations when deciding which shape to go with.

- The shape of the clients hands
- The length of the fingers
- The shape of the cuticles
- The type of work the client does

It is generally felt that the nails should be shaped to mirror the shape of the cuticles. Only an attractive hand can direct attention to itself by exaggerated shape and color. People who perform work with their hands usually require shorter nails in order to avoid nail breakage and injury.



The square nail is completely straight across the free edge with no rounding at the edges. The length depends on the client's preference.

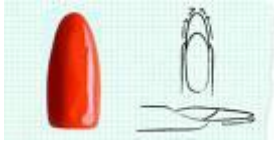
The Round Nail



The round nail should extend only slightly past the tip of the finger with the nail tip rounded off. The entire nail may be polished with a slight half-moon left at the base and a white margin left at the sides of the nail.

The Oval Nail

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Is the ideal nail shape and can be styled by either covering the entire nail with polish, leaving the free edge white, or leaving the half-moon at the base of the nail white.

The Pointed



Nail is well suited for the thin, delicate hand. The nail should be tapered somewhat longer than usual to enhance the slender appearance of the hand. The nail can be completely polished, or a half moon can be left at the base.

The Squoval Nail



A square nail with the ends rounded or taken off. As the name suggests, the shape is a combination of square and oval.

Preparing the manicure table

- Sanitize the manicure table and drawer with an approved disinfectant.
- Place a clean towel over the client's cushion.
- Place a bowl of warm soapy water to the left of the client. When giving a hot oil manicure, replace the finger bowl and brush with an electric hot oil heater.

- Place disinfected metal implements, and a new orangewood stick on a clean or disposable towel.
- Arrange cream or lotion bottles, and nail polishes in the order that these will be used. Place them to the left of the manicurist.
- Place the disinfected abrasive and fresh emery boards to the right of the manicurist.
- Attach a small plastic bag to the table with adhesive tape, on either the right or left side, for waste materials.
- Prepare a fresh disinfectant solution for your implements on a daily basis.
- Keep the manicuring table drawer clean and neat.

Manicuring procedures

Before any manicuring procedure, please wash your hands with mild hand soap, rinse well, and dry them. Allow your client to wash their hands. This keeps down the spread of bacteria.

Before the manicure, arrange your files, implements, and tools on a table towel located on top of the work station, keeping everything within reach.



Note: Begin working with the hand that is not the client's favored hand. The favored hand will need to soak longer, because it is used more often. If the client is left-handed, begin with the right hand and if the client is right-handed begin with the left hand.



Remove all traces of old polish by moistening a cotton or gauze pad with a nail polish remover of your choice. Press the pad onto the nail plate, hold for a few seconds, then swipe toward the free edge. Change the pad often as the remover cannot perform well if it is saturated with old polish. Dark polishes are the hardest to remove. The old polish may get on your skin or underneath the free edge. If this happens, wrap a small piece of cotton on the end of an orangewood stick, saturate it with nail polish remover, and clean the polish from the cuticle line and under the free edge of the finger nail.



[CLICK HERE TO SEE TIPS FOR STAINED NAILS](#)

Use a grit file to remove the finger nail length by filing from the outside corner to the center of the nail plate. The shape of the nails shape should be decided during the client consultation. File the nails starting with the little finger and working toward the thumb. (Never saw back and forth across the free edge as it can disrupt the nail plate layers and lead to splitting and peeling).

- Hold the client's finger between the thumb and first two fingers of your left hand.
- Hold the file and emery board in your right hand and tilt it slightly so that filing is confined mainly to the underside of the free edge.
- File each nail from corner to center, going from right to left and then from left to right. Filing nails according to their growth pattern avoids splitting. If the nails need shortening, they can be cut with fingernail clippers also. This will save time during the filling process. Avoid filing deep into the corners of the nails. They will look longer and be stronger if permitted to grow out at the sides.



Once the finger nails have been filed and shaped, you can seal the free edge by using a 3-way buffer (black to refine, white to semi-shine, and gray to finish). This will seal the layers of the free edge to further prevent splitting or peeling.



After filing nails on the right hand, file two nails of the left hand. Then immerse the right hand into the finger bowl to soften the cuticle. Finish filing the nails of the left hand. Remove the right hand from the finger bowl. Clean the nails by brushing them with a sanitized brush. Use downward strokes starting at the first knuckle and brushing toward the free edge.

Remove the fingers from the soaking dish. Dry the fingertips, using both hands on the towel. Carefully dry the right hand, including the area between the fingers. While holding the orangewood stick or metal cuticle pusher as you would a pencil, proceed to gently loosen and push back the cuticle skin from the nail plate surface. Keep in mind that all you want to do is remove any cuticle skin from the nail plate; you do not want to break the seal between the proximal nail fold and the nail plate. Perform this procedure on all five fingers, and then do the same on the other hand.



With a thin layer of cotton around the edge of a new orangewood stick, apply cuticle remover around the cuticle of the right hand.



Use the spoon end of the cuticle pusher to gently loosen the cuticle. Keep the cuticle moist while working. Use the cuticle pusher in a safe position, to remove dead cuticle adhering the nail without scratching the nail plate. Use a circular movement to help lift cuticles that cling to the nail plate. The cuticle remover will probably remove enough of the cuticle so that none will need clipping. Use light pressure to avoid damaging the root of the nail and the nail plate. Remember: NEVER CUT FLESH. Be careful to only trim the dead tissue. If no translucent tissue has been pushed from the nail plate, or if there are no dead skin, there is no need to trim anything.

- Use a cotton tipped orangewood stick, dipped in soapy water, to clean under the free edge, working from the center toward the side with gentle pressure. Once again, do not apply pressure when performing this procedure to prevent a tear or break from occurring in the nail plate seal. Any tear or break in the seal between the nail plate and the nail bed is the perfect entry for bacterial microorganisms that may cause an infection.
- An optional step is to bleach under the free edge. With a cotton tipped orangewood stick, apply hydrogen peroxide or other bleaching preparation under the free edge of the nail.
- After this procedure, you may wish to exfoliate the hands. This can be done by dispensing a small amount of sloughing lotion into the palm of one hand, and distributing the lotion evenly between the palms. Afterward, with gentle manipulation, apply the lotion to the client's hands and fingers. Also, manipulate the palm of the hand and the fingers, being very gentle with the back of the hands. Manipulate for just a few minutes, then rinse the lotion from the hand and fingers. Next, wipe and clean the hands with a wet terry cloth. Finally, dry them thoroughly.

The next process will involve the application of cuticle oil or cream around the side and base of the nail. Manipulation must be performed in a rotary movement.

Brush the nails over the finger bowl. Using a downward movement to clean the

nails of both hands, dry the hands and nails thoroughly.

If the nail plate surface is ridged, corrugated, or looks uneven, you may wish to smooth the surface using a three-way buffer. The direction of the buffer must be in harmony with nail growth to prevent the disruption of nail plate layers. Gently file with the black side of the buffer, and then proceed to the white and gray sides in sequence. Buffing with all three sides to create a high gloss shine will help to seal the nail plate surface from staining, and dehydration.

You may want to perform a Paraffin treatment as an extra service. The client may have dry, calloused skin or just wishes to be pampered.

Note:

When dipped in melted paraffin wax the hands are softened and moisturized. Paraffin wax can be heated to temperatures of over 100 degrees Fahrenheit, without burning or injuring the hand. This intense heat allows for deeper absorption of emollients and essential oils. The wax is infused with various botanical ingredients such as Aloe Vera, chamomile, tea tree oil, and azulene. Fruit waxes such as peach, apple, and strawberry are often used in salons. Lotion is rubbed on the hand before submersion into the paraffin bath. The hand is dipped more than once to allow a thicker wax coat to form, making the coating stay warm for a longer period. This creates a bond that is less likely to break or tear prematurely. After both hands have been dipped in the wax, they are wrapped in either plastic or aluminum foil. In some cases a special type of plastic bag or glove is used. In addition, the wrap is covered with a towel or special mitten to retain warmth. Allow the hands to soak for five minutes or more in order for the paraffin to cool and dry.

Before you begin this procedure, apply an instant sanitizing agent to the clients hands, fingers, and wrist to be sure that all surface contaminants have been removed.



Dip each hand gently and slowly into the paraffin. Hold the hand in the solution for just an instant and then remove the hand.



Allow the wax to set, and then dip each hand again. Dip and remove each hand several times. Wrap each hand with a plastic liner, then cover them with terry cloth gloves. Using the plastic liner, remove the paraffin from the hands and fingers. Discard the waste after use.



After completing all previous procedures, wash, rinse, and dry the hands and nails. Make sure that the surface of the hands and nails are completely free from oil, lose filings, etc. Keep in mind that nail polish will not adhere to an oily surface. You may wish to wipe the nail plate with a dampened pad to be sure all traces of these products have been removed.

Apply the base coat, beginning with the right hand. Use long strokes starting with the little finger and working toward the thumb.



Allow the base coat to dry until it is slick to a light touch. **TIP: If using a nail strengthener or hardener, apply it under the base coat.**

Choose the desired color of liquid polish and apply. After removing the brush from inside of the polish, there will be a bead of polish on the end of the brush. Wipe the excess polish from the brush, using the lip of the bottle. This will be enough to complete the polish application in three strokes without having to dip the brush back into the bottle.

Hold the brush at a 30-degree angle. Starting in the center of the nail, place the brush at 1/16 of an inch away from the cuticle. Brush toward the free edge. If you go back to dab at any spots you missed, the polish will not appear smooth on the nail. The more strokes you use, the more lines and lumps will appear on the polished nails. If you miss a small area on the nail, you can cover this area when you apply the second coat. Practice covering the entire nail each time, especially near the cuticle. This application will help to avoid creating a shadow of polish on the nails. Wait until the polish settles before continuing to avoid the formation of bubbles.



Remove excess polish. Dip a cotton tipped orangewood stick into nail polish remover. Apply it carefully around the cuticles and nail edges to remove excess polish.

Using long strokes, apply the top or seal coat first to the right hand, and then to the left hand. Brush around and under the tips of the nails for added support and protection. A UV top coat can be used instead of an air-dry top coat. Place both of the client's hands under a UV lamp dryer.

Instant nail dry is optional. Apply it to each nail to prevents smudging, dulling, and to decrease drying time.

The manicure is now completed.

FRENCH MANICURE

A French manicure includes the polishing of the free edge of the nail. The free edge is also polished, tipped, or sculpted in an opaque color. The nail plate is polished or left in a more translucent color. This is a very popular service in the salon. This technique creates nails that appear clean and natural. Also, it offers a good base for designs with flat nail art, airbrushing, rhinestones, pearls, and stripping tape. A French manicure usually uses a more dramatic white on the free edge of the nail. The American manicure calls for a more subtle white.

CLICK BELOW TO VIEW PROCEDURE FOR DOING A FRENCH MANICURE

<http://www.viddler.com/explore/CanadianGoddess/videos/2/> after you finish reviewing click the back button to return to the class

PEDICURING

The popularity of shoes that expose the heels and toes has created the demand for Pedicure services. During the winter months, people develop rough harsh heels and unattractive toenails. Foot care not only improves personal appearance, but also adds to the comfort of the feet.



Equipment, Implements, and materials used in a pedicure:

The equipment, implements and materials required for pedicure are similar to those used for manicuring:

- **Clients chair with armrest**



- **Low stool for manicurist**



- **Ottoman on which to rest the client's foot**



- **Basin (large) or a spa pedicure chair large enough to hold warm, soapy water in which to soak client's feet.**



- Prepare a **Waterproof apron**, or an **extra towel**, to place over the lap to protect the uniform. Use two towels for drying the client's feet.



- **-Liquid soap**



- **Antiseptic foot spray contains an antifungal agent as well as a mild antiseptic.**



- **Disposable toe separators** are used to keep the toes separate during a pedicure.



- **Cuticle Nippers**



- **Toenail clippers.** Two types of toenail clippers are available; both are acceptable for a professional pedicure.



- **Cotton Pledgets**



- Witch hazel or other astringent



- Foot lotion or Cream. Used during the foot massage.



- Foot Powder, Contains an antifungal agent for keeping feet dry after a pedicure.



- Pedicure Slippers, Disposable paper or foam slippers for clients who have not worn open-toed shoes.



- **Toenail Nippers;** use only the professional nippers made specifically for cutting toenails. They come with either curved or straight jaws. They allow you to trim the corner of a toenail properly; trimming improperly can cause an ingrown toenail.



- **Curette:** This small spoon shaped implement, if carefully used, is the ideal tool for cleaning the debris from the nail margins. With most clients, you will only have to use it along the margins of the great toenails. Only occasionally is it necessary to clean along the lesser toenail margins. Most curette tools are quite sharp on their edges.



- **Nail Rasp-** (optional). This small spoon-shaped implement, if carefully used, is the ideal tool for cleaning the debris from the nail margins. With most clients, you will only have to use it along the margins of the great toenails. Only occasionally is it necessary to clean along the lesser toenail margins. Most curette is quite sharp on their edges.

- **Diamond Nail File:** This implement files and thins the free edge of the toenails. It is metal with diamond dust embedded in the metal; it comes in coarse medium and fine grits. The coarse grit is usually best for toenails. The file is thin, flexible, and can be used in the same manner as other nail files. A major advantage is that it is easily sanitized, and can be kept in a disinfectant solution. Therefore, it can be used safely on many different clients. This file is not easily worn out, making the initial expense extremely cost-effective. However, files that are not metal cannot be washed and disinfected. It must be discarded after each use.



Foot paddle, this implement is used to smooth calluses on the feet; it comes in many different sizes and shape.



REMEMBER CALLUS SHAVERS ARE PROHIBITED! A Callus is there for a reason; it protects the underlying skin from irritation. A callus should be softened and smoothed not removed.

When making a pedicure appointment, suggest that the client wear open-toed shoes or sandals so that the polish will not smear. Another alternative would be to offer pedicure thongs along with open toed socks to keep the feet warm in colder weather.



Not all clients will want or need a full pedicure service. Some only need a professional nail trimming. You can help your client decide what is most suitable.

To perform a pedicure you will need all of the same files, implements, and tools required to perform a manicure. You may want to replace the finger bowl with a footbath. If you are performing this procedure on yourself, place a large folded terry towel on the floor in front of you. This is where you will set the footbath, after filling it partway with water. Add a few drops of liquid soap or nail scrub, essential oils, or your favorite footbath/salts to the water and allow it to disperse.

Place all your implements, files, and supplies on a terry towel within easy reach. You will be following the same type of procedure as with a manicure. However, the files you use will be of a different grit. Toenails are generally thicker than the fingernails, and require a grit of about 180 to remove length. You will also need to use your toenail nippers. You may also wish to spray or wipe your feet with an antiseptic spray prior to starting your pedicure. Be sure to thoroughly wash your hands.

You may also choose to use some of the same 'optional' products with your pedicure that you used with your manicure.

Pedicure procedure

- **Remove old polish from the nails of both feet.**



- **Clip the toenails** of the left foot first, taking care that they are even with the end of the toe. In some cases, a small corner of the nail is trimmed out. Trimming the corner of a toenail, if done properly, does not cause an ingrown toenail.



- Using both hands, carefully insert toe separators between the toes of the foot.



- **File toenails straight across**, rounding them slightly at the corners to conform to the shape of the toe. Smooth any rough edges with the fine side of the emery board. Use a 240-grit file to smooth the underside of the corners and to bevel the free edge.



- **Use a foot file** on the ball and heel of the foot to remove dry skin and smooth down callus growths, do not file too much this can cause irritation and bleeding.



- **Remove toe separators**
- Place one or both feet into the footbath. Flip on the massage button if your machine is equipped with the massage feature. Allow your feet to soak for a full five minutes.



- **Apply cuticle remover** if you wish and massage it into the cuticle.
- **Use your orangewood stick** or the metal cuticle pusher to push back the transparent cuticle, and clean under the free edges. Never 'dig' into the flesh. Breaking the seal between the nail plate, and the nail bed will allow bacterial organisms to enter causing an infection to occur. Do not use excessive pressure to push back the cuticles; this action could damage the matrix.



- If loose cuticle skin is apparent, you may remove it by nipping with the cuticle nippers, being careful not to cut the fleshy areas.
- Repeat the above steps on the other foot.
- Scrub your feet and toenails with the nail brush, being sure to cleanse the lateral nail fold and underneath the free edge.

- If you have a buildup of calloused skin, it can be filed with an 80-grit foot file paddle. **Never attempt to use a credo blade to cut or remove calloused skin. Remember these blades are prohibited in the salon.** If the callous is thick, apply callous remover creams. Do not attempt to remove all of the calloused skin in one session. Depending on the depth of the callous, it can take several months or more for the healthy skin to show.
- Manipulate both feet by applying lotion, cream or oil to the palms of your hands and then to your feet. After manipulating the feet, lower legs, and toes put both feet back into the footbath and scrub the toes to remove all traces of oil or lotion. To remove the suds or bath salts, use a spray bottle filled with warm water to rinse the toes. Dry your feet, legs and toes; make sure to dry between the toes also with a soft towel.
- Wipe each toenail using a cotton or gauze pad saturated with remover or alcohol. Be sure the nail plate is free of oils.
- Apply a basecoat, two coats of color, and a thin topcoat. Be sure to allow a minimum of 1 minute between coatings for each coat of polish to dry.
- If you are afraid of smudging the polish, you may wish to use toe separators between your toes. Leave them in place until the enamel has completely dried.

FOOT Manipulation



Performing a good, thorough foot massage is an excellent way to build client loyalty. Be gentle but firm when handling the foot. Too light of a touch or hold will produce a tickling sensation, which is not relaxing for most clients.

Here are some techniques for the manipulating of the left foot; make the necessary adjustments for massaging the right foot.

1. RELAXER-Movements to the joints of the foot: After resting the client's foot on the footrest, grasp the leg just above the ankle with your left hand. This will brace the client's leg and foot. Use your right hand to hold the left foot just beneath the toes, and rotate the foot in a circular motion.

2. EFFLEURAGE-(light or hand stroking movements on the top of the foot): Place both thumbs on top of the foot at the instep. Move your thumbs in a circular motion, rotating them in opposite directions down the center of the top section of the foot. Continue this movement up to the toes. Keeping one hand in contact with the foot or leg, firmly slide one hand at a time back to the instep rotating back down to the toes. This is a relaxing movement. Repeat this technique three to five times.

3. EFFLEURAGE on the heel (bottom of foot): Use the same thumb movement that you used on top of the foot. Start at the base of the toes, and move from the ball of the foot to the heel. Slide your hand back to the top of the foot. This is a relaxing movement. Repeat this technique three or five times.

4. EFFLEURAGE (movement on toes): Starting with the little toe, place your thumb on the tip and your index finger on the bottom of the foot. Hold each toe and rotate with your thumb. Start at the base of the toe, and work toward the end of the toes. This is relaxing and soothing. (Repeat three or five times.)

5. JOINT MOVEMENT FOR TOES: Start with the little toe, and make a figure eight with each toe. Repeat three or five times.

6. THUMB COMPRESSION (friction movement): Make a fist with your fingers, keeping your thumb out. Apply firm pressure with your thumb, and move your fist up the heel toward the ball of the foot. Work from the left side of the foot, and back down the right side toward the heel. As you massage over the bottom of the foot, check for any nodules or bumps. If you find one, be very gentle because the area may be tender.

7. METATARSAL SCISSORS: Place your fingers on top of the foot along the metatarsal bones with your thumb underneath the foot. Knead up and down along each bone by raising your thumb and lowering your fingers to apply pressure. This is Petri sage, or kneading movement that promote flexibility and the stimulation of blood flow.

8. FIST TWIST COMPRESSION: Place your left hand on top of the foot, and make a fist with your right hand. With the left hand, apply pressure while your right hand twists around the bottom of the foot. This helps stimulate blood flow. Repeat this technique three or five times.

9. PERCUSSION: Use your fingertips to perform tapotement movements. This involves lightly tapping over the entire foot to reduce blood circulation as you complete the massage.

Diseases and Disorders of the Nail

Our bodies host a variety of microorganisms, some of which are beneficial to us. These microorganisms also include **bacteria** and **fungi**. Fungal infections are caused by microscopic plants that live on our skin and on the dead tissue of our hair and nails. The following list contains the more common nail irregularities, diseases and disorders.

Paronychia infections of the nail fold can be caused by bacteria, fungi and some viruses. The proximal and lateral nail folds act as a barrier, or seal, between the nail plate and the surrounding tissue. If a tear or a break occurs in this seal, the bacterium can easily enter. This type of infection is characterized by pain, redness and swelling of the nail folds. People who have their hands in water for extended periods may develop this condition, and it is highly contagious.



Paronychia Infection

Pseudomonas bacterial infection can occur between the natural nail plate and the nail bed, and/or between an artificial nail coating and the natural nail plate. Many people have been led to believe that the classic 'green' discoloration of this type of infection is some type of mold. In actuality, mold is *not* a human pathogen. The discoloration is simply a by-product of the infection and is caused primarily by iron compounds. *Pseudomonas* thrive in moist places; it feeds off the dead tissue and bacteria in the nail plate, while the moisture levels allow it to grow. The after effects of this infection will cause the nail plate to darken and soften underneath an artificial coating. The darker the discoloration, the deeper into the nail plate layers the bacteria has traveled. If the bacteria have entered between the nail plate and the nail bed, it will cause the same discolorations and may also cause the nail plate to lift from the nail bed.



Pseudomonas bacterium trapped between the nail plate and the nail bed. ("The 'Greenies'")

A **fungus** or **yeast** infection which results in Onychomycosis, can invade through a tear in the proximal and lateral nail folds as well as the eponychium. This type of infection is characterized by Onycholysis (nail plate separation) with evident debris under the nail plate. It normally appears white or yellowish in color, and may also change the texture and shape of the nail. The fungus digests the keratin protein of which the nail plate is comprised. As the infection progresses, organic debris accumulate under the nail plate often discoloring it. Other infectious organisms may be involved, and if left untreated, the nail plate may separate from the nail bed and crumble off.



Fungal Infection of the nail plate.

Tinea Unguis, or ringworm of the nails, is characterized by nail thickening, deformity, and eventually results in nail plate loss.



Ringworm of the nails.

Onychatrophia is an atrophy or wasting away of the nail plate which causes it to lose its luster, become smaller and sometimes shed entirely. Injury or disease may account for this irregularity.



Nail Atrophy

Onychogryposis are claw-type nails that are characterized by a thickened nail plate and are often the result of trauma. This type of nail plate will curve inward, pinching the nail bed and sometimes require surgical intervention to relieve the pain.



Ingrown Toenail

Onychorrhexis are brittle nails which often split vertically, peel and/or have vertical ridges. This irregularity can be the result of heredity, the use of strong solvents in the workplace or the home, including household cleaning solutions. Although oil or paraffin treatments will re-hydrate the nail plate, one may wish to confer with a physician to rule out disease.



Vertical Split in the nail plate

Onychauxis is evidenced by over-thickening of the nail plate and may be the result of internal disorders -- seek medical advice.



Onychauxis

Leuconychia is evident as white lines or spots in the nail plate and may be caused by tiny bubbles of air that are trapped in the nail plate layers due to trauma. This condition may be hereditary and no treatment is required as the spots will grow out with the nail plate.



Leuconychia

Beau's Lines are nails that are characterized by horizontal lines of darkened cells and linear depressions. This disorder may be caused by trauma, illness, malnutrition or any major metabolic condition, chemotherapy or other damaging event, and is the result of any interruption in the protein formation of the nail plate. Seek a physician's diagnosis.



Beaus Lines

Koilonychia is usually caused through iron deficiency anemia. These nails show raised ridges and are thin and concave. Seek a physician's advice and treatment.



Koilonychia

Melanonychia are vertical pigmented bands, often described as nail 'moles', which usually form in the nail matrix. Seek a physician's care should you suddenly see this change in the nail plate. It could signify a malignant melanoma or lesion. Dark streaks may be a normal occurrence in dark-skinned individuals, and are fairly common.



Melanonychia

Pterygium is the inward advance of skin over the nail plate, usually the result of trauma to the matrix due to a surgical procedure or by a deep cut to the nail plate. Pterygium results in the loss of the nail plate due to the development of scar tissue. Cortisone is used to prevent the advancement of scar tissue. Never attempt to remove pterygium -instead, consult a physician for advice and treatment.



Pterygium

NOTE: The 'true cuticle' is often referred to as Pterygium. If you have pterygium, it can only be treated by a physician and should never be removed by a nail technician.

Pterygium Inversum Unguis is an acquired condition characterized by a forward growth of the hyponychium characterized by live tissue firmly attached to the underside of the nail plate, which contains a blood supply and nerves. Possible causes are systemic, hereditary, or from an allergic reaction to acrylics or solvents. Never use force to 'push back' the advancing hyponychium -- it is an extremely painful approach, and will result in a blood flow. Consult a physician for diagnosis and treatment.



Pterygium Inversum Unguis

Psoriasis of the nails is characterized by raw, scaly skin and is sometimes confused with eczema. When it attacks the nail plate, it will leave it pitted, dry, and it will often crumble. The plate may separate from the nail bed and may also appear red, orange or brown, with red spots in the lunula. Do not attempt salon treatments on a client with Nail Psoriasis. Consult with a dermatologist for diagnosis and treatment.



Psoriasis of the nails

MMA Damaged Nails: D. Tuggle, owner of The Nail Academy, Jamaica, Queens, N.Y., submitted this picture of nails damaged by MMA to the Beauty Tech Web Site and allowed it to be added to this page. MMA (methyl methacrylate) is a liquid monomer used for acrylic nails by some unscrupulous salons even though it is considered by and prohibited by the FDA to be a poisonous and deleterious substance. According to Dianna Bonn of Indiana, as of May 1, 1999, 23 states have banned this chemical from being used in nail salons. MMA nails are very rigid and do not bend or have the flexibility to break. When MMA does finally break, it will break the natural nail with it, causing severe nail damage.

MMA Damage
Photo by D. Tuggle

Brittle Nails are characterized by a vertical splitting or separation of the nail plate layers at the distal (free) edge of the nail plate. In most cases, nail splitting and vertical ridges are characteristic of the natural aging process. This nail problem is also the result of overexposure to water and chemical solvents such as household cleaning solutions. As we age, the nail bed's natural flow of oils and moisture is greatly reduced. This oil and moisture is the cement that holds the nail plate layers together and gives the plate its inherent flexibility.



Splitting Layers

At the first signs of splitting or peeling, re-hydrate the nail plate layers with a good quality cuticle and nail oil that contains Jojoba and Vitamin E as two of the botanical oils. Jojoba oil has a very tiny molecule which can penetrate the nail plate surface, open up the layers and draw the Vitamin E in after it. The molecular structure of Vitamin E is too large to penetrate the nail plate layers or the surface layer of the skin without the benefits of Jojoba oil. Oil the nail plate and surrounding cuticle at least twice daily; more if you have your hands in water a lot. Wear gloves whenever working with household cleaning solutions, and remember: water is considered the 'universal solvent', and is indeed a 'chemical'.



Peeling Layers

Vertical Ridges are also characteristic of aging, although are not limited to the aged or elderly. The nail plate grows forward on the nail bed in a 'rail and groove' effect, much like a train rides on its' tracks. As we age, the natural oil and moisture levels decline in the nail plate and this rail and groove effect becomes apparent. Ridged nails will improve through re-hydration of the nail plate with twice daily applications of a good quality nail and cuticle oil containing Jojoba and Vitamin E.



A **Hematoma** is the result of trauma to the nail plate. It can happen from simply trapping your finger or toe in the car door to friction from improperly fitting or 'too-tight' shoes, to a sports related injury. A hammer does a pretty good job at causing a hematoma as well! The nail bed will bleed due to this trauma, and the blood is trapped between the nail bed and the nail plate. A hematoma may also indicate a fractured bone. Many people who participate in sports activities experience hematoma because of the constant friction from the shoes against the toenails. Hematoma may result in nail plate separation and infection because the blood can attract fungi and bacteria. If several days have passed and the blood clot



becomes painful, the nail plate may require removal so the nail bed can be cleansed.

Nail Patella Syndrome is a rare genetic disorder involving nail and skeletal deformities (among a host of other related anomalies) that occurs in approximately 2.2 out of every 100,000 people. It is transmitted as a simple autosomal dominant characteristic in the ABO blood group (Autosomal dominant means that you only have to inherit one copy of the gene to get it). It also means that there is no such thing as an unaffected carrier, and NPS CAN NOT skip a generation.

In cases where there seems to be no previous family history of NPS, it is thought to be caused by a sporadic gene mutation (which is probably how it began in all families at one time or another). Once NPS is in a family, the risk of transmitting the disorder from parent to offspring is 50% for each pregnancy, regardless of the sex of the child, with females being affected approximately 10% more often.



The severity of nail dysplasia is extremely variable. Nails may be small and concave, longitudinally grooved, abnormally split, pitted, softened, discolored, or brittle. Toe nails are usually less affected than finger nails.

There are other nail irregularities that only a trained dermatologist will be able to diagnose and treat. Some are contagious, and some are the result of injury or illness. Physicians will sometimes examine your fingernails because many diseases will appear as various changes in the nail plate. Any change in the nail plate could be cause for concern, whether it is a simple splinter hemorrhage that appears as a tiny black line in the nail plate, or a drastic change. Nail technicians are trained to beautify the hands/feet and are not allowed to diagnose nail diseases or to treat

them in the salon. For your nail health, seek the diagnosis and recommendation of a knowledgeable dermatologist.

Understanding Artificial Nail Terminology

Many of us hear terms associated with nails and artificial nail enhancements that are either unclear in their definition, or they are confusing by their very nature. Many of these terms are chemically related, yet they can be simple terms to understand. This list contains terminology associated with natural and artificial nails, procedures, and a few product or additive definitions.

Adhesive: A chemical that causes two surfaces to stick together.

Allergen: A substance capable of producing an exaggerated or adverse reaction, such as sneezing, coughing, rash or irritation in sensitive individuals.

Allergic Reaction: Allergic reaction, or an allergy, is an adverse reaction to the body usually characterized by skin redness, itching, blisters and localized swelling.

Acrylic: A polymerized polymer coating... This coating is formed through the combination of an exact mix ratio of monomer to polymer. Today's acrylic monomers (liquid) are made with Ethyl Methacrylate (EMA) due to its inherent flexibility. Acrylic polymers (powder) contain approximately 70% EMA, and 30% MMA (Methyl Methacrylate). This combination of chemicals creates an enhancement that is both flexible and strong and mimics the natural nails flexibility and strength.

Bacteria: A single cell organism. Some bacteria are capable of causing disease.

Balance Point Positioning: Stabilizing your working hand on your other hand for steady control.

Benzoyl Peroxide: A heat-sensitive initiator used in monomer and polymer systems.

Breathing Zone: The two foot sphere around each person's mouth, from which all your breathing air is drawn.

Brittleness: The properties that determine how likely something is to break under force.

Chemical: Everything you see and touch except for light and electricity.

Contamination: To make impure, infected, corrupt, etc., by contact with or addition of something.

Co-polymer: Polymers made of two or more different types of monomers.

Cross-linked: Polymers that create a chemical bond between two other polymer chains.

Crystallization: An undesirable, but preventable formation of tiny crystals in the uncured nail coating that usually results from unusually cold temperatures or drafts. Liquid will actually freeze and turn into a solid before it polymerizes with the powder (polymer).

Cuticle: True cuticle is the layer of translucent or colorless skin that is constantly being shed from the underside of the proximal nail fold.

Dehydration: To remove moisture from a surface, substance or object this will improve adhesion and help to prevent yeast, bacterial and fungal infections.

De-lamination: The peeling apart of two improperly adhered surfaces. Natural nails can de-laminate due to a lack of natural oil and moisture levels in the nail plate layers. Most often referred to as 'lifting'.

Dermis: The dermis is the bottom layer of skin. The surface of the dermis is grooved with many tiny channels, slits or tracks, upon which the nail moves as it grows.

Disinfection: A procedure used to control micro-organisms on non-living surfaces such as: instruments, implements or environmental surfaces.

Distal Edge of Plate: Distal means the farthest edge, or the free edge.

Ethyl Methacrylate (EMA): Ethyl Methacrylate is most widely used in monomer form as one part of the system used to create artificial nail enhancements. EMA can be safely soaked from the nail plate for complete removal. EMA is a 'flexible' monomer.

Etch: The process of rendering a design on a hard surface (such as glass) by corroding its surface with acid. This term is often used to describe the filing process used to remove the surface shine from natural nails in preparation for a nail enhancement service. 'Etching' is usually accomplished by using a heavy grit file to remove the surface shine, and to disrupt the nail plate layers. Today's products do not require the use of this damaging method to ensure adhesion.

Epidermis: The epidermis is the upper most layer of skin. It is attached to the bottom of the nail plate and is ridged with tiny 'rails' that run in the same direction as the dermis grooves. The effect is much like a train riding on its tracks as it moves forward.

Eponychium: The eponychium is the extension of the proximal nail fold at the base of the nail body which partly overlaps the lunula.

Esters: A small specific portion of a structure of a molecule. All nail coating polymers, except for polishes, contain esters.

Flash Point: The temperature at which a substance gives off a sufficient amount of vapors to form an ignitable mixture with air. Products with a low flash point (below 100° F) should not be used in the presence of (or near) fire, flame, sparks or high heat, i.e., a lit cigarette or automobile trunks. The flash point of a product can be found in the MSDS.

Flexibility: Determined by how much a substance will bend under force.

Free Radicals: Very excited molecules which cause many kinds of chemical reactions.

Fumes: Irritating smoke, vapor or gas.

Fungi: Fungi are microscopic plant organisms consisting of many cells, such as mold, mildews and yeast. Fungi are incapable of manufacturing their own food and behave as either parasites or saprophytes.

Gel (Nails): Gel is often referred to as *not* being acrylic, when in fact they are based on both the methacrylate and the acrylate family, and are indeed acrylic. Gels are made by pre-joining some of the monomers into short chains called oligomers. Oligomers are single chains that are several thousand monomers long. Gels create rigid surface coatings and are usually cured by exposure to ultra violet light.

Hardness: A measure of how easily a substance is scratched or dented.

Hazardous Ingredient: Any substance which may be capable to causing physical or health related injury to an exposed individual.

Hydroxyl Ethyl Methacrylate (HEMA): HEMA is a protein specific monomer that will seek out and firmly attach itself to the protein in the nail plate. HEMA is used as an additive to improve adhesion.

Hyponychium: the hyponychium is that portion of the epidermis under the free edge of the nail.

Interpenetrating Polymer Networks (IPN's): A polymer that weaves through other polymers and increases cross-linking.

Lateral Nail Fold: The lateral nail fold is the surrounding soft tissue around the sides of the natural nail.

Lunula: The lunula, or half-moon, is located at the base of the nail. The area under the lunula is the front of the matrix. The light color of the lunula may be due to

the reflection of light where the matrix and the connective tissue of the nail are joined.

Material Safety Data Sheet (MSDS): Chemical information sheets also containing safety precautions on each potentially hazardous product one uses. It is an OSHA regulation for all salons to have MSDS on premises for all products containing potentially hazardous chemicals.

Matrix: The matrix is that part of the nail bed that extends beneath the nail root and contains nerves, lymph and blood vessels. The matrix produces the nail and its cells undergo a reproducing and hardening process. The matrix will continue to grow as long as it receives nutrition and remains in a healthy condition.

Mildew: A white or grayish coating formed by fungi on plant leaves, cloth, paper, etc...

Mix Ratio: Relation in degree or number between two things.

MMA (Methyl Methacrylate): MMA in its liquid form has been banned for use in the nail industry due to the severity of allergic reaction and damage to the natural nail plate. It adheres so tightly to the nail plate that it can literally rip the nail plate from the nail bed due to heavy pressure from a blow or trauma to the nail. MMA is so hard that it cannot be safely removed from the nail plate by soaking in any form of remover -- it must be filed from the nail plate with a heavy abrasive.

Mold: Any of various fungous growths formed on the surface of organic matter. Mold is not a human pathogen.

Monomer: Individual, reactive chemical units which may be linked together to form a polymer.

Nail Bed: the nail bed is the portion of skin upon which the nail plate rests. It contains blood vessels that supply nutrients to the fingertip.

Nail Plate: The hard keratin coating that protects the fingertip and underlying tissue.

Nail Root: The nail root is at the base of the nail and is embedded underneath the skin. It originates from an actively growing tissue known as the matrix.

OSHA: Occupational Safety and Health Administration.

Overexposure: Chemical hazards caused from prolonged, repeated exposure beyond levels specified as safe by regulatory agencies.

Pathogen: A micro-organism which is capable of causing disease.

Polymer: Any of numerous natural and synthetic compounds of unusually high molecular weight consisting of repeated linked units, each a relatively light and simple molecule.

Polymerization: The process of forming a polymer. To unite two or more monomers to form a polymer.

Prep: Prep contains chemicals such as Ethyl and/or Butyl Acetate, Isopropyl Alcohol and other ingredients. Prep is a temporary dehydrator and deep cleanser that will remove the moisture and some of the oils from the nail plate layers. It will disinfect the nail plate, is a pH balancer, and aids in physical and chemical bonding. The effects of prep will last approximately 30 minutes before the nails oil and moisture are replaced by natural means.

Primer: Primers are usually made with 100% pure methacrylic acid. Although primers are caustic to skin, they are not caustic to the nail plate. Primers aid in product retention because one end of the molecular chain is attracted to the oil molecule in the natural nail plate, and the other end is attracted to the monomer molecule. Primers act like double-sided sticky tape.

Proximal Nail Fold: The proximal nail fold is often mistaken for the cuticle. The cuticle is actually shed from the underside of the proximal nail fold. 'Proximal' means "nearest attached end". The proximal nail fold acts like a gasket to seal off the matrix where the new nail plate is growing.

Pterygium: Pterygium is a reversal of the normal inward folding of the skin under the free edge of the nail plate, or the lateral nail folds. This can be caused by trauma and by certain skin conditions such as lichen planus. A dermatologist can sometimes remove this excess tissue by using acid peels or surgery.

Sanitation: Sanitation reduces the number of pathogens or bacteria on a surface.

Sector Sculpting: Structurally engineering the enhancement for proper balance.

Sensitization: Sensitization is a type of allergic reaction in which the affected person becomes increasingly sensitive to the allergy causing substance through repeated and prolonged contact.

Sensitizer: A chemical that causes a substantial portion of exposed people or animals to develop an allergic reaction in normal tissue after repeated or prolonged exposure to a chemical.

Solehorn: the rigid epidermis stays attached to the bottom of the nail plate until it grows beyond the free edge. This tissue is called the solehorn cuticle, and will eventually slough off by itself or is removed during a manicure.

Solidification: the process of turning from a liquid to a solid.

Sterilization: Sterilization completely destroys all living organisms on an object or surface.

Strength: The ability of a substance to withstand breakage under force.

Vapor: The gas formed by the evaporation of liquids.

Ventilate: To admit fresh air into a space in order to replace stale air.

Viscosity: The measure of a liquid's ability to 'flow'; related to the thinness or thickness of a liquid. You will see this term used on the MSDS.

Acrylic and Artificial Nail Product Chemistry Starting With a Clean Nail

Whenever an artist begins a painting on canvas, he/she always prepares the canvas by applying a coat of white primer. Why? Because it allows the paint to better adhere to the porous surface. This same principal holds true for nail enhancement coatings. In order for the products to properly adhere to the porous surface of the nail plate, one must begin with a clean start.

A clean start begins with simple hand-washing and scrubbing the nail plate to remove surface oils and other contaminants that interfere with proper adhesion. Nail scrubs will do much more than remove oils. Scrubs get rid of bacterial and fungal spores which lead to infections. Skipping this step is the major cause of nail infections, and can also cause enhancements to lift at the cuticle.

Common Misconceptions

One of the most dangerous misconceptions in the professional nail industry is that products don't stick unless you "*rough up*" or '*etch*' the nail plate. This is absolutely false and very harmful to clients. Heavy abrasives strip off much of the natural nail plate, leaving it thin and weak. This leaves no supporting structure for the enhancements. Rough filing also damages the nail bed; it promotes allergic reactions and causes painful burning sensations, infections, loss of the nail plate, product lifting, and breakage. Thin nails are more flexible. This extra flexibility allows the enhancement to bend too easily, and creates invisible, hairline fractures that lead to breakage.

Highly magnified microscopic crack in the surface of a polymer. This crack is approximately ten microns wide or 1/10 the thickness of a human hair.

Photo Courtesy
Creative Nail Design Systems, Inc.



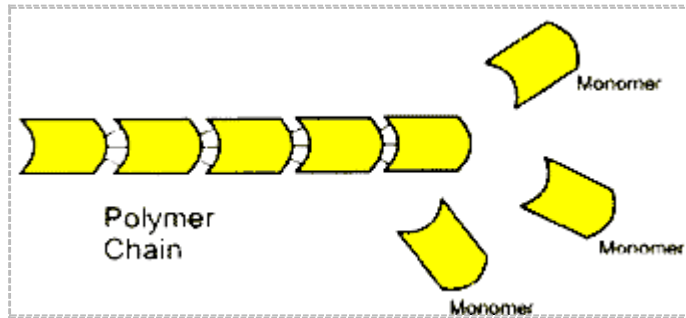
Heavy abrasives and high-speed drills generate lots of heat which is produced by friction. This heat leaves the nail bed sore and damaged; heating the nail bed to over 150° F. Need to rough up the nail plate to get good adhesion? Then

something is wrong! Many nail technicians have great success without roughing up the nail plate. Why? The answer is simple; they properly prepare the nail plate, use correct application techniques, and high quality products. Lifting problems can always be traced back to one of these three areas.

Monomers and Polymers

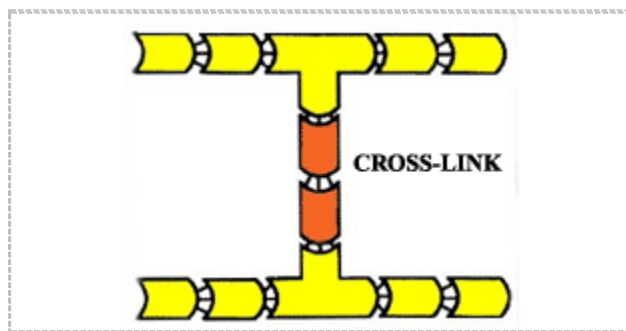
Monomers are like Tinker toys; they can be arranged and rearranged into almost unlimited combinations. Monomers can hook together into extremely long chains; each chain containing millions of molecules. Very long chains of molecules are called polymers. Polymers can be liquids, but they are generally solids. Chemical reactions that make polymers are called polymerizations. Sometimes the term cure or curing is used, but it has the same meaning. A monomer is a molecule that makes polymers. It takes an initiator molecule to begin this chemical reaction. The initiator molecule touches a monomer and excites it with a boost of energy. Monomers prefer the quiet life; they don't appreciate too much excitement, so they look for ways to get rid of the extra energy. They do this by attaching themselves to the tail of another monomer, passing the energy along. When this reaction begins, monomer chains sprout up everywhere. They grow longer and longer, becoming knotted and tangled until they are a teeming mass of microscopic strings.

This game of 'tag' continues the chain of monomers becomes longer and longer until the growing polymer chain can't find anymore monomers. Once the monomer is all gone, the chain reaction stops and the polymer is formed, although the chemical reaction is not finished. The surface may be hard enough to file, but it will be days before the chains reach their ultimate lengths.



Cross-linking Monomers

A cross-linker is a monomer with 'arms'. Normal monomers can join only head to tail. Cross-linkers also join head to tail, but their extra 'arms' grow new chains. These cross-linking monomers join with other nearby chains and can link three or more chains. Cross links are like rungs on a ladder; creating strong net-like structures. Cross-links can also join many other layers of cross-linked nets. The result is a three-dimensional structure of great strength and flexibility. This is how many types of artificial nail enhancements are made.



A polymer with too much cross-linking is brittle and easily shattered. However, cross-linked polymers can be made stronger with IPN's (Interpenetrating Polymer Network). Imagine weaving a strong polymer rope through the holes of the cross-linked net. This rope will add strength to the net without causing brittleness.

Shrinkage

All polymers shrink when they form, there is no exception in any nail product. Monomers don't normally touch each other and bounce around the container at

high speeds trying to avoid other monomers. They join only when the conditions are right, and then they embrace very tight. Imagine billions of monomers suddenly coming closer together -- the effect is very noticeable. In fact, nail enhancement polymers shrink between 3-20% with some shrinking more than others. Excessive shrinkage (above 12%) causes many problems, such as lifting, tip cracking, and other types of service breakdown.

Over cross-linking causes excessive shrinking, too. Tightly woven nets shrink more than loose weaves. The effects of shrinkage can usually be seen. Too much shrinkage may cause product to lift in the center of the nail plate and can often look like a 'bubble'. One way to control shrinkage is by following the manufacturers' directions. Improperly mixing (too wet a consistency) and incorrect curing polymers may cause excessive shrinkage and other more serious problems.

Initiators

Energy is the final key to understanding how monomers become polymers. All monomers need energy to make polymers. Initiator molecules control everything. They are the starting gun that begins the monomer race. Some initiator monomers get their energy by only absorbing light energy while others absorb only heat energy.

Product Types

Light-cured products are energized into polymerizing by absorbing light energy, usually UV (ultra-violet) light. Not all light-curing products use UV light -- some have initiators that use visible light. Sunlight and even artificial room lights can start polymerization in the container.

Heat-cured products use the heat in the room and body heat to cause polymerization. Many monomers cure at room temperature, 68° - 74° F. Tip adhesives (also monomers) and wraps are examples. A few products require

normal incandescent light bulbs -- these are not light-curing monomers. They use the extra heat released from a light bulb and are still heat curing.

Catalyst

Catalysts are used in nail products to make chemical reactions happen faster. They are like the trigger on the starting gun, making the initiator molecules work faster and more efficient. If one of these 'parts' is missing, initiator, energy or catalyst, the chemical reactions will happen much more slowly or not at all.

Exothermic Reaction

When two monomers join, an extremely small amount of heat is released. This is called an exothermic reaction. This happens with all types of nail enhancement products; however, some release more heat than others. One normally cannot feel the heat released from two monomers, but remember -- it takes billions of monomers to make a nail enhancement. Can you feel the heat from this exothermal? The answer is definitely yes! Under certain conditions it can be quite noticeable, especially for monomers used to make wraps and light-cure products. Unless the heat causes your client to become uncomfortable, you should not be overly concerned. However, exotherms that burn the clients' nail beds can cause damage to the tissue and weaken the enhancement.

1. The warmer the monomer, the faster it will cure. If the room temperature is too warm or the table lamp is above 60 watts, the extra heat makes monomers react faster. Sometimes, your client will feel their nail beds become very warm, even hot!
2. It takes time to do things right; faster isn't always better. Faster means more heat in a shorter time and can lead to uncomfortably warm exotherms. It may also cause enhancements to lose some flexibility and lower toughness. An exotherm can reach in excess of 170° F!

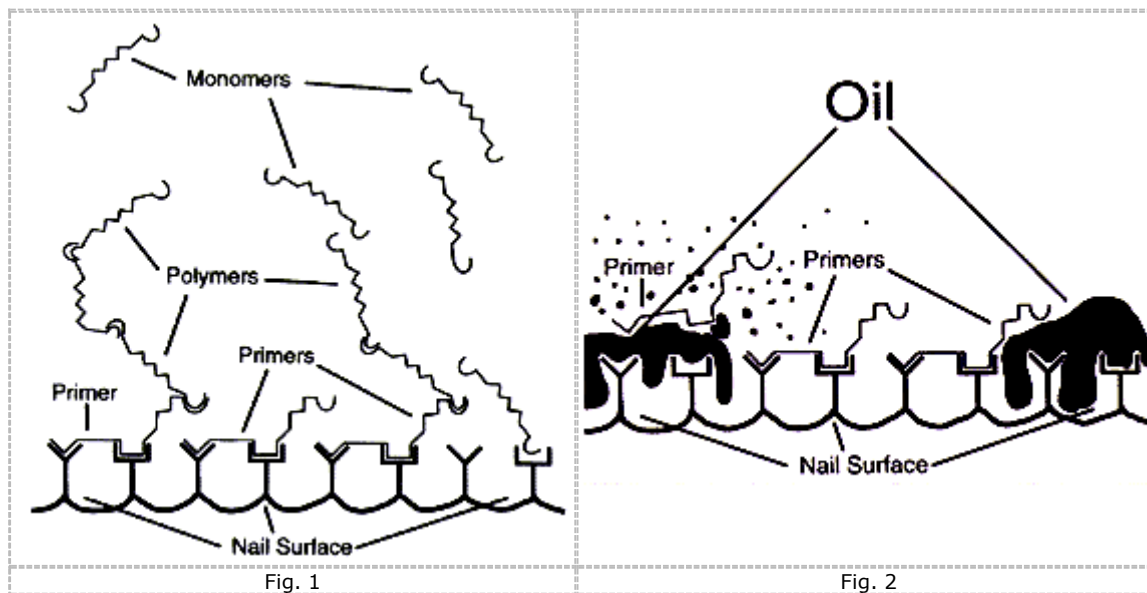
3. Unhealthy or damaged nail beds may be the reason for clients complaining of burning sensations, as they are very sensitive to heat. Even tiny exotherms are easily felt on these overly sensitive tissues. Generally, the primary reason for unhealthy nail beds is over filing and over priming. The heat from heavy abrasives and high-speed drills are usually the culprits. Drill bits use friction to cut away the surface. Friction creates heat, and a lot of it! Even light abrasive files and drill bits can cause nail bed damage. Filing too hard, too often, or for too long makes nail beds sore and sensitive.
4. Metal forms can act as a catalyst and cause extra exotherms, but rarely will it cause burning.
5. Nipping lifted material will literally 'rip up' good tight layers of product along with vital nail plate layers, making them more sensitive to exotherms.

Primers

Primers act much like double-sided sticky tape by making the nail plate more compatible with certain liquids. One end of the primer chain is a perfect match to the nail plate. The other end of the primer chain is a perfect match to the monomer and polymer chain. Fig. 1

Acid-based primers dissolve molecules of residual oils from the natural nail. These microscopic traces are not removed during normal scrubbing procedures and may lead to service breakdown. Fig. 2

Nail primers must be used with caution as some are very corrosive to skin. Nail primers, like most professional nail products, should never touch the skin. To do so can cause painful burns and scars.



Dehydrators

Nail dehydrators (Prep) are extremely important. Moisture can interfere with the adhesive bond which leads to delamination or lifting. To ensure proper adhesion, always scrub the nail plate, dry thoroughly and dehydrate. Skipping one step will lead to delamination and may also contribute to infections. Some preparation products contain pathogen fighters that remain on the nail plate to aid in the prevention of nail infections. The effects of dehydration are apparent for up to 30 minutes before the natural moisture levels are restored by the body.

Nail Polish Chemistry

Modern nail polish has been in use since the 20's. Although the basic chemistry remains the same, many things have changed since the original product was introduced. A typical formulation consists of four major ingredient types: polymers, plasticizers, solvents and pigments.

Type of Substance	Chemical Name	Use by %	Reason For Use
Polymer	Nitrocellulose	10%	Strengthens TSF Resin and makes it hard and shiny.
Polymer	TSF Resin	10%	Improves adhesion and toughens the coating -- sticks strongly to the nail plate, but is soft and dull looking.
Plasticizer	Dibutyl Phthalate	5%	Increase flexibility and wear of the polymer base.
Solvent	Ethyl Alcohol	5%	Solvents make spreadable liquids, and keep the polymer and additives dissolved. After the polish is applied, the
Solvent	Ethyl Acetate	20%	

Solvent	Butyl Acetate	15%	solvent slowly evaporates, leaving the remaining ingredients.
Solvent	Toluene	30%	
Pigments	Various Colors	5%	Titanium dioxide (a white pigment) is frequently added with other colored pigments to reduce the number of coatings.

Nail Hardeners

"Contains no Formaldehyde" is seen on some nail enamel or polishes. Should formaldehyde be a concern for nail enamel users? In most cases, no! The negligible amount found in enamel is extremely safe. One exception is the prolonged use of products with more than 1% formaldehyde. At these levels, formaldehyde may cause severe allergic reactions. Fortunately, most nail enamels contain less than 0.0015% formaldehyde. This tiny amount comes from an important ingredient called toluene sulfonamide formaldehyde resin (TSF resin). This resin is very different from formaldehyde in that it will not cause problems unless the client is already allergic to formaldehyde, i.e., from the use of formaldehyde nail hardeners.

Nail hardeners may legally contain as much as 3% formaldehyde. Concentrations above 1% will cause the natural nail to stiffen and lose flexibility. Clients usually confuse this stiffness with strengthening. They incorrectly assume that harder nails must be stronger. Although the nail actually bends less, it has actually lost strength. Prolonged use of formaldehyde causes the nails to become split, dry and brittle.

Toluene

Toluene has been safely used in nail enamels since the 30's. In the 90's toluene has become a very controversial ingredient. Paranoid politicians passed a state law in California that basically says that safe is not safe enough. California law requires exposure to be thousands of times below the federal safe-exposure level. Because of a lawsuit, the state of California asked for a study which would determine the level of toluene in the average salon. The study showed that the level of toluene found in salon air is more than 200 times below the federal limits. In other words, the air would still be safe to breathe even if the toluene vapors of 200 salons were put into one salon.

Toluene is used to dissolve other ingredients in nail enamels. Polishes with toluene apply smoother and produce more brilliant colors that resist peeling. No other solvent does as good a job as toluene.

TSF Resin

Toluene sulfonamide formaldehyde resin is a polymer produced from each of the chemicals in its name. This particular polymer is widely used to increase the strength of the primary nail polish polymer, nitrocellulose. Hypoallergenic polishes usually contain a polymer resin which makes the polish about 10 - 20% less durable. Another alternative is toluene sulfonamide epoxy resin. This polymer has slightly better properties than the polyesters; however, polishes that contain this resin suffer from poor shelf life. Neither can it compare to TSF resin for strength and durability.

The Acrylics

Nail technicians use many types of products to create artificial nail enhancements. Light-cure gels, liquid-and-powder systems, wraps and no-light gels all seem totally different and unrelated, but nothing could be further from the truth. The monomers used to make each of these are very closely related and, in fact, come from the same chemical family, the acrylics.

Two-part (Liquid and Powder) Systems

The 'liquid' is really a complex mixture of monomers. The 'powder' is a polymer which contains the initiator and other additives. The polymer acts as a carrier, holding other ingredients -- some of which are coated on the outside of the polymer. The mineral **titanium dioxide** is used to create a more natural appearance. This is the same pigment used in white house paint and children's finger-paint. Dyes are added to give the polymer a pinkish or bluish color. Pink dyes will also cover-up yellowing and product discoloration. Blue coloration acts

as an optical brightener; whites look whiter when a small amount of blue is added.

A heat-sensitive initiator is added to the polymer; usually **benzoyl peroxide**. This is the same initiator that is found in acne creams. The heat of the room and hand is enough to break a molecule of benzoyl peroxide in half. Each half is capable of exciting or energizing a molecule. When a molecule breaks in half, it is called a **free radical**. Free radicals also play a role in wrinkling and aging. Many skin care products contain chemicals which eliminate free radicals -- so, as you can see, some free radicals are beneficial while others are not.

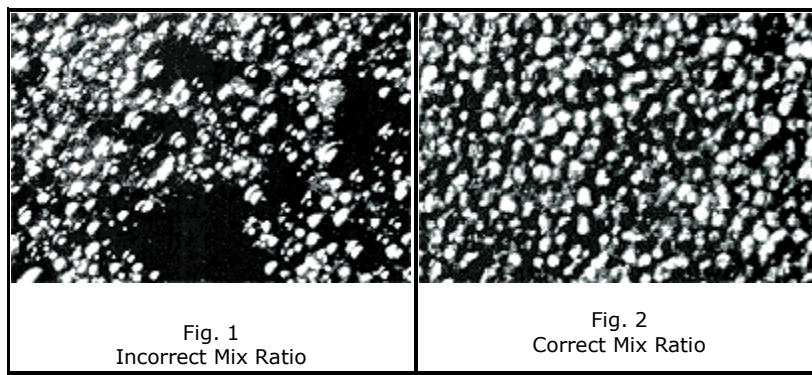
Free radicals are very excited molecules that cause many kinds of chemical reactions and can be found almost everywhere. Once a free radical excites the monomer, it is completely eliminated. Monomers are mixed with polymers containing benzoyl peroxide. Heat will break the initiator in half, and each free radical will energize a molecule. The energized monomer will attach to another monomers tail, passing the energy along until all the monomers are hooked together into a teeming mass of long chains. Only the monomer can make a new polymer. The growing chains of monomer wrap around the polymer. The polymer powder does NOT react; it is only a carrier for the initiator to the monomer.

So where does the polymer powder come from? As you might suspect, the polymer powder starts out as monomer. The monomer is placed in a large mixer which may hold over 1000 gallons. Solvent is added to dilute the monomer, initiator and catalyst are added and the blend is mixed rapidly. After several hours, the monomer polymerizes into tiny beads, the solvent is drained away, and the beads are dried and packaged.

Consistency (Mix Ratio)

Consistency is determined by the amount of polymer powder used. The polymer powder gives the enhancement much of its strength. When the monomer

polymerizes, it surrounds each tiny bead which reinforces the entire enhancement. Nail Technicians sometimes use extra monomer to smooth the surface of the enhancement, or use too wet a consistency during application. Too much monomer lowers consistency and reduces strength which results in excessive breakage. (Fig.1) The highest strength is obtained by using the correct ratio of monomer to polymer. (Fig. 2)



Too dry a consistency causes breakage and lifting, but too wet a consistency is worse. If the mixture is too wet, the enhancements may seem strong, flexible, and adhere well to the nail plate, but don't be fooled. Too wet a consistency is one of the leading causes of allergic reaction in clients and nail technicians. Wet consistencies may give better adhesion, but they lower strength. Dry consistencies have equal amounts of monomer and polymer and offer the best strength, but less adhesion. Medium wet consistencies give the best of both worlds; they are strong, flexible and offer good adhesion.

A medium-wet consistency is a mixture of 1 1/2 parts monomer to 1 part polymer. To determine if your consistency is correct, make a bead in your normal fashion. Carefully lay the bead on top of a clean, unfiled tip, placing the bead directly on the center or the apex. Do not pat or press the bead -- it should form a small mound or dome. Watch the bead for 15 seconds and note what you see. Does the bead begin to settle or flow out almost immediately? Does the height of the bead drop halfway or more in 15 seconds? Does the bead seem to lose most of its original shape? Can you see a ring of monomer around the base of the

bead? If you answered yes to any of these questions, your bead is probably too wet. If you answered yes to all of these questions, your ratio is probably greater than 3 parts monomer to 1 part polymer.

Wrap Systems

The monomers used to create wraps are called cyanoacrylates and are members of the acrylic family. They are the same monomers used to create many fast setting adhesives such as Krazy Glue. Professional nail products are specifically designed for use on fingernails and are far superior for this application. These monomers are sensitive to alcohol, water, and weak alkaline substances, and in large amounts they can cause almost-instant polymerization. A drop of water or alcohol on wrap monomers will cause 'shock cure'. They will harden quickly and turn cloudy white. They turn cloudy because shock curing causes thousands of microscopic cracks. They are invisible to the eye, but the cracks will scatter light reflecting from the surface. Small amounts of these substances cause slower, controlled reactions which result in polymers which are clear, flexible and strong. Wraps, however, do not have the advantage of being cross-linked.

Water-sensitive monomers must be protected from moisture in the air which is why they are sold in containers with small nozzles. This prevents air molecules from gelling or thickening the product. As with other monomers, inhibitors are used to prevent gelling. Even so, leaving a container open for too long will thicken the product fairly quickly. You might think this moisture sensitivity is a negative, although it actually is a positive. The nail plate contains enough moisture to polymerize wrap monomers, and just touching the nail plate is often enough to react the monomers. (This is one reason why cyanoacrylates so easily adhere ones fingers together.)

Catalysts speed up the polymerization and reduce cure time from minutes to seconds. Spray or brush-on catalyst causes an almost-instantaneous reaction. The catalysts in wrap systems are generally weak alkaline substances which may be

listed as "aromatic amines". Rapid reactions cause rapid heat build-up. Incorrectly used, these catalysts may heat the nail plate to a blistering 170° F. A small amount of warming is beneficial and will improve strength; however, pain-causing heat may cause serious burns to the nail bed. To avoid over-heating, some catalysts must be sprayed from a distance. Always wear the proper mask when using these systems to protect you from the vapors of mists and sprays.

Tip Adhesives

Cyanoacrylates

Certain types of cyanoacrylates are used as tip adhesives and are formulated differently. They are sensitive to moisture and work best when there is no air. Most set slowly or turn to a rubbery gel in the presence of air. When the air supply is cut off, the adhesive quickly sets. This feature is beneficial for the nail technician, allowing maximum working time and a quick set once the tip is properly placed. Thinner adhesives set faster, but this is not always good because extremely fast setting adhesives give lower strength. If you have a client whose tips just don't seem to hold or they separate in a few weeks, try a slower-setting thicker adhesive.

Thin adhesives work best if the tip to nail plate fit is perfect. If there is a gap between the tip as there generally is with ski-jump nails, nails with missing sidewalls, bitten or broken nails, then the thicker, slower setting adhesives will give the best retention. Thicker adhesives (gel adhesive) will fill in the gaps and irregularities and allow for a tighter bond. With gel adhesives, less is more. These adhesives usually contain dissolved methacrylate powder to give the bond more strength, especially in the gaps. Some adhesives contain special wetting agents which help improve nail adhesion, strength and clarity. Since these adhesives are not cross-linked, they are affected by moisture. Clients who frequently wet their hands should be warned that all cyanoacrylates are moisture sensitive, and should be instructed to wear gloves whenever possible. This is true of both adhesives and wraps.

Glue

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The word "glue" is commonly misused -- especially in the professional nail industry. People often use this term to mean anything that is sticky. Glue is a name for a certain type of adhesive. True glues are adhesives made from animal protein, hide, bones and hooves. No professional nail adhesive is made from animal by-products, so it is incorrect to call them 'glues'. The proper term is adhesive. The professional nail industry uses advanced monomer adhesives, not glue!

Wrap Fabrics

Various types of fabrics are used to reinforce the polymer wrap coating. These fabrics provide support and added strength to the coating. There are three fabrics in wide use: fiberglass, silk and linen. The type of fabric is not as important as the weave. The weave and thickness of the fabric determine its usefulness; the monomer must be able to penetrate the weave, soaking completely through the fabric. If the monomer sits on top of the fabric, it leaves tiny spaces or voids between the monomer and the fabric's fibers. These voids create weak areas where cracks may later develop and grow. If the monomer absorbs easily into the fabric, the coating will be stronger and clearer. Proper wetting allows the monomer to cover the surface more thoroughly, penetrate deeper, and hold tighter.

Fiberglass and silk are very similar in properties. Silk is more easily wetted and creates a more natural appearance. If properly applied, both silk and fiberglass create thin, strong and natural-looking enhancements. Linens tend to be thicker and tightly woven, making it difficult for the monomer to penetrate the fabric. The result is thick, cloudy coatings that must be worn with polish to cover the unnatural appearance. Because the monomer cannot completely wet the linen, these fabrics can lift and peel away (delaminate). Medium-weave silk and fiberglass provide the best overall combination of strength, retention, clarity and wetting.

Skin oil and other contaminants can block wetting. Touching fabric will deposit large amounts of skin oil on the fabric. To eliminate many of the problems associated with wraps, including lifting, peeling and cracking, avoid touching the fabric with your fingers.

UV Gel Systems

UV or visible light-curing gels have been around for many years, but have recently gained popularity. Newer products are beginning to meet the tough demands of the professional nail industry. Since these systems can use either visible light or UV light to create enhancements, the term "gel" will be used when referring to both types of products.

No-light Gel

This term is misleading and suggests that these are like regular UV gels because they need no light. Not true! These products are wrap monomers that have been thickened to have a gel-like appearance. They should be used and handled as any other wrap product. They have most of the benefit and disadvantages of the other wrap products. Many feel that the gel wrap product is easier to use because it is thicker; however, thicker monomers will not wet fabric as easily.

Gels are often sold as being 'not acrylic', but in fact are based on both the methacrylates and the acrylates family. Polymerizing monomers with UV or visible light is not very efficient as it is difficult to get the UV light deep into the gel. If gels were made entirely of monomers, most of the gel would not turn into a polymer. One way to improve efficiency is to pre-join some of the monomers into short chains. These short chains are neither monomers nor polymers -- they are in between: oligomers.

Oligomers make it easier to create polymers. An oligomer is a single chain that is several thousand monomers long. Joining a few hundred oligomers is much faster than joining a million individual monomers. Why are gels so thick? Nail enhancement monomers are liquids and polymers are solids, so it makes sense that oligomers are in between. This is why gels are 'gel-like' inconsistency. Now you can understand one of the disadvantages of most gel systems. They are more difficult to use because of their heavy consistency and their tendency to be stringy. On the positive side, the thicker consistency reduces evaporation and odor.

Some initiators use heat energy and others use light. It is easy to keep light away from gels so the initiator, catalyst, and oligomers can be combined together into a single product. This is possibly one of gel's greatest advantages. They come premixed and ready to use. Still, no system is perfect. Each has advantages and

disadvantages. Curing with UV or visible light is more convenient, but raises special problems that must be addressed. Since initiators are activated by light, they must penetrate completely through the gel to polymerize all of the oligomers. Unfortunately, this does not occur. Thick coatings of gel allow less light to reach the bottom layers. In Europe where gels are used extensively, they attempt to overcome this with powerful UV lights. These systems use 38-40 watts of UV light. American systems tend to be far lower, usually 8 watts. UV bulbs emit only UV-A, so there is little danger. However, the high-wattage lamps are far more expensive and can cause problems as well. Remember, when polymers cure too quickly, they release large amounts of heat in a short period of time. This can cause serious and damaging burns to the nail beds.

As a rule, the thicker the coating, the less efficient the cure. It is much better to use three or four thin coats rather than one or two thicker coats. Thinner coats allow more light to penetrate the layer. Also, the hands will be under the gel light longer if more coatings are used. Another advantage is reduced shrinkage. Gels shrink more than any other type of enhancement. Using thinner coats reduces the effects of shrinkage.

Bulb condition is vital to the success of gel enhancements. UV lamps become ineffective many months before they burn out. After about 6 months of normal use, a bulb has less than half its original UV energy. UV bulbs should be changed twice per year even if they look fine. If the product seems to set slower than normal, change the bulbs immediately. Clean the bulbs whenever needed or at least once per week.

Finally, the type of oligomer used plays an important role in skin allergy. Since acrylates tend to cure much faster, they are more likely to cause allergic reactions. For this reason, acrylate monomers are rarely used in monomer-and-polymer formulations. The stickiness of gels also contributes to allergies because the sticky gel is more likely to remain on implements and skin. Gels should NEVER be allowed to touch the skin -- NEVER touch your client's cuticles, either. If contact occurs, immediately cleanse the area with soap and water. Keep brush handles, files, containers, and implements free of gel.

As gel ingredients become more sophisticated, the products will improve and many of the problems associated with gels will no longer haunt nail technicians.

Playing it Safe

Most people believe chemicals are dangerous or toxic substances. Ask someone about chemicals and they might mention toxic waste dumps or factories dumping poisonous waste into streams. Actually, everything we see and touch is a chemical, except for light and electricity. Air is a combination of many chemicals; oxygen, hydrogen and nitrogen. Clean, pure mountain stream water is a chemical. A newborn baby's skin is 100% chemical.

Why do people only think of chemicals in a negative way? It is because of the dramatized and exaggerated images created by the media. These images are misleading and inaccurate. The truth is, 99% of the chemicals we come in contact with in our lives are completely safe and beneficial. Water is the most common salon chemical. Water can be very dangerous! In fact, it can kill you within minutes. Try sticking your head in a bucket full of water for 5 minutes. Foolish? Yes! Since we were very young, our parents taught us the potential hazards of water; it is dangerous to swim after a big meal or use a blow dryer in the bathtub, and not to drive fast on wet pavement. We all learned the rules, and the same holds true for salon chemicals. There are 'safe working' rules we must follow, or we will suffer the consequences. Every chemical can be safe and every chemical can be dangerous -- it's up to you!

No chemical in the world can be harmful unless you overexpose yourself. Every chemical substance has a safe and unsafe level of exposure. Simply touching, inhaling, or smelling a potentially hazardous substance can't harm you. Exceeding the safe level of exposure is the danger we must learn to avoid!

Some chemicals are dangerous even in tiny amounts and are not suited for salon use. Professional products are formulated to be as safe as possible, though no nail product or other cosmetic product is free from all risks. A normally safe product can become dangerous if used incorrectly. Even gardeners and mechanics must follow safe working procedures.

Reduce Your Exposure

Material Safety Data Sheets provide information to all chemical workers, including nail technicians. MSDS help firefighters deal with chemical fires or clean up large spills, and doctors to treat accidental poisonings. Any professional product that contains a potentially hazardous substance has an MSDS. What can you learn from an MSDS?

- Potentially hazardous ingredients found in each product.

- Proper storage and fire prevention.
- Ways to prevent hazardous chemicals from entering the body.
- The short and long-term health effects of overexposure.
- Early warning signs of product overexposure.
- Emergency first aid advice.
- Emergency phone numbers.
- Safe handling techniques.

There are only three ways that a potentially hazardous chemical can enter the body. If you block these 'routes of entry', you will automatically lower your exposure.

1. *Inhalation* by breathing vapors, mists, or dusts.
2. *Absorption* through the skin or broken tissue.
3. *Unintentional* or accidental ingestion.

The human body is very rugged and complex, giving early warning signs of overexposure. Unfortunately, these symptoms are often ignored. For instance, overexposure to some solvents can make you feel very tired or keep you from sleeping. Overexposure can cause headaches, nausea, angry or frustrated feelings, nosebleeds, coughs, dizziness, tingling fingers and toes, dry or scratchy nose and throat, puffy red and irritated skin, itching, and many other symptoms. Watching for these acute symptoms will help you avoid more serious, long-term problems.

Plan Ahead

- *Accidents happen when they are least expected.*
What would you do if a small child ran up to your table and drank from your bottle of primer? The MSDS will provide emergency numbers that may save a life.
- *Keep products capped or covered when not in use.* Empty waste containers regularly.

Just because you don't smell anything doesn't mean there are no vapors in the air. Keeping products closed will drastically reduce the amount of vapors released by 'volatile' or evaporating liquids.

- *Avoid pressurized spray cans and use metal waste containers with pop-up lids.*

Surgical type masks (often called dust masks) are completely ineffective against vapors. These masks should only be used to keep dust particles out of your lungs.

- *Never use a dust mask to protect yourself from vapors.* Vapors are far too small to be 'filtered' by dust masks. Use a mist mask if you spray anything. Some high-quality masks are also effective against mists. These are called mist-rated masks; however, they too are ineffective against vapors.
- *Always wear a dust mask when filing, especially if you use a drill.*

Our lungs can handle a lot of dusts because it has ways of removing and disposing of inhaled dusts. When you inhale more than the lungs can handle, you increase your risk. Drills make much smaller dust particles than files or emery boards. These smaller particles lodge deeper into the lungs, making them more hazardous to your health. Drills spin in a clockwise direction and will actually 'throw' the dust in your face, and remain in your breathing-zone up to 60% longer than the dusts from hand filing. These smaller particles will settle on every surface and even the slightest breeze will send them back into your air.
- *Never judge product safety by odor.*

What is the most dangerous misconception about chemicals in the salon industry? Many believe that they can tell how safe or dangerous a chemical is simply by its odor! Wrong! A chemical's smell has absolutely nothing to do with its safety. Some of the most dangerous substances known have very sweet, pleasant fragrances.
- *Never smoke, eat or drink in the salon.* Always store food away from salon chemicals and wash your hands before eating or going to the restroom. A cigarette lighter will produce a spark that may ignite flammable liquids and vapors.

Coffee cups can easily collect dusts. Hot liquids, like coffee and tea, will

absorb vapors right out of the air. Dusts can settle on your food, and your food can absorb the vapors. Think not? Lay a piece of bread on your table in the morning, and then take it outside with you at the end of the day. What is that smell? Chemical vapors!

- *You should always wear approved safety glasses whenever you work and should give your client a pair to wear as well.*
Your client may love you and think you are the greatest nail technician in the world. But, if you accidentally splash primer or wrap monomer in their eyes, you have lost a friend and gained a lawsuit! You are responsible for the client's safety while in your care.
- *Soft contact lenses can absorb vapors from the air -- never wear contact lenses in the salon, and wash your hands before touching the eye area.*
Wearing contacts while in the salon is risky as vapors will collect in the soft lenses and make them unbearable. Even if you wear safety glasses, the vapors are still absorbed. The contaminated lens can etch the surface of the eye and cause permanent damage. If an accidental spill occurs, the liquid will 'wick' under the lens, making proper cleansing of the eye more difficult.
- *Treat all chemical products with respect. Don't be fooled by marketing terms like "nontoxic", "natural", and "organic."*
Organic simply means the chemical contains carbon in its structure. Most things on earth are organic. Cow dung, poison ivy, and road tar are all 100% organic and natural. Natural simply means "occurring in nature." Nature is a wicked place; filled with poisonous substances. **Natural** doesn't mean a product is safe, wholesome, or even better.
- Don't judge a chemical by what it CAN do -- what's important is how easily you can prevent the potential hazard.

Alcohol (in beer and wine) CAN cause liver damage -- if you drink a couple quarts a day for 5 years! It won't happen because you have a margarita with lunch. There is no need to fear chemicals, just be careful and wise.

Know your products, read and understand the MSDS, read all product

warning labels, and follow the manufacturer's application guidelines for all your salon products.

- To reduce exposure to vapors, ventilate, don't circulate!
Air-conditioning units are designed to circulate the existing air in a room. A ventilation system will 'remove' the existing air and draw fresh air into the room. Vented manicuring stations will help 'control' dusts and vapors, but only if the charcoal filters are changed regularly.

Understanding Your Natural Nails



According to an article in Nailpro Magazine, the desire to have long beautiful nails first began during the Ming dynasty (1368-1644), when aristocratic women grew their nails up to 10 inches long as a sign that they performed no manual labor. To protect their nails, they often sheathed them in gold or silver. Chinese men grew long nails as a sign of their masculinity and to protect themselves from evil. Our fascination with nails continues to grow, and has established nails as a multi-billion dollar industry.

Ask someone to show you their fingernails, and they will usually point to the nail plate; however, the nail plate is only one of the many parts that comprise the complete nail unit.

The Nail Unit

Proximal nail fold: means 'nearest attached end' and is the soft tissue that protects the emerging nail plate.

Lateral nail fold: Is an extension of the proximal nail fold and protects each side of the nail plate.

Eponychium is the visible part of the proximal nail fold that appears to end at the base of the nail.

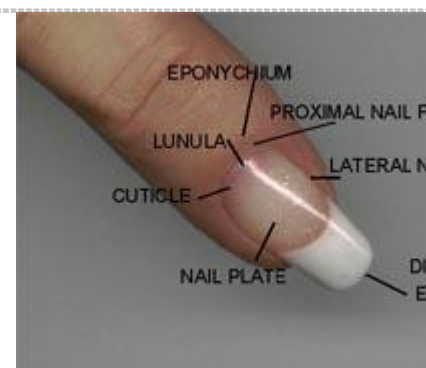
Cuticle: The eponychium will shed a thin, colorless layer of skin that rides on the nail plate and appears to grow from under the proximal nail fold. It is this transparent layer of skin which is called the 'true cuticle', which is removed during the manicuring process.

Lunula: The opaque pale white 'half-moon' at the base of the nail, and forms the emerging immature, plump nail plate cells. As these cells grow forward, they lose their inner material and become flat, hard and transparent.

Distal Edge: The distal edge is commonly referred to as the 'free edge'.

Nail Plate: The nail plate is made of keratin protein formed by amino acids. These proteins are a strong, flexible material made from many layers of dead, flattened cells. Hair and skin are also keratin protein; however, they are much softer and more flexible.

Matrix: The matrix produces the cells that become the nail plate. The size, length and



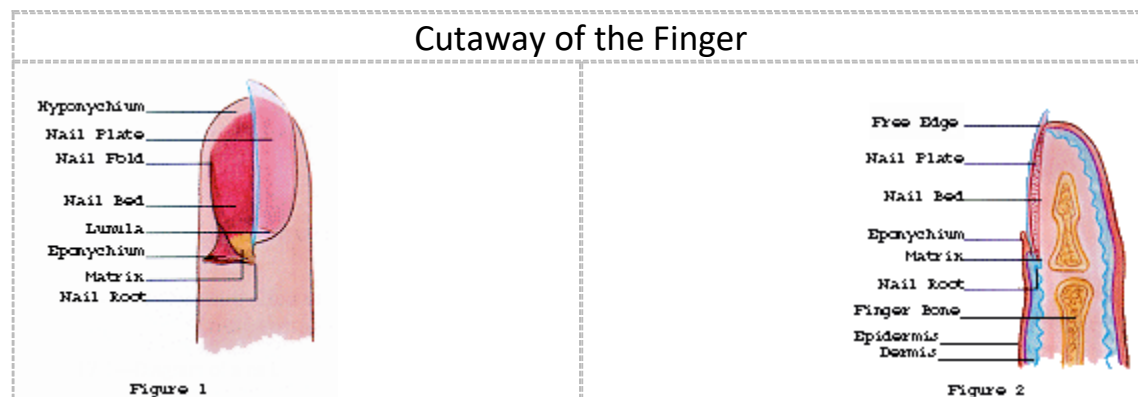
shape of the matrix determine width and thickness of the nail plate. It is the shape of the fingertip bone that determines if the nail plate is flat, ski-jump, arched or hooked.

Nail Bed: The nail bed is made of two types of tissue: dermis and epidermis. The dermis is the lower portion which is attached to the bone, while the epidermis lies just underneath the nail plate. The epidermis moves forward with the nail plate and is attached to the dermis by tiny 'rails and grooves' that allow the nail plate to move much like a train rides on its tracks. As we age, the nail plate becomes thinner and we see evidence of the 'rail and groove' as vertical ridges in the nail plate.

Solehorn: This type of cuticle is a layer of translucent, dead tissue that is shed from the nail plate. It seals between the nail plate and the hyponychium. It either sloughs off on its own, or is removed during the manicure process. This skin, if not properly removed, can become stained with nicotine and/or other chemicals and will give the appearance that the distal edge of the nail plate is discolored.

Hyponychium: Refers to the soft skin that is the distal end of the nail unit and the nail bed. It lies directly under the 'free edge'.

Onychodermal Band: This is the seal between the nail plate and the hyponychium. It is found just under the free edge and can be recognized by its glassy, grayish color.



The Onychodermal Band is found in _____ The shape of the nail plate is _____

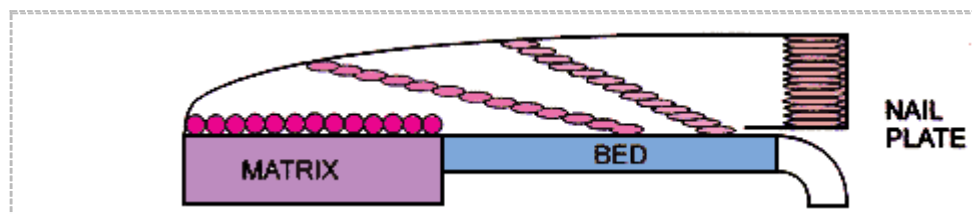
that portion of the nail where the nail bed ends. It cannot be seen on some individuals while it is highly prominent on others.

determined by the shape of the finger bone. In this figure, one can see that the nail plate follows the shape of the finger bone and the plate is fairly flat.

Photographs: Milady's Standard Textbook of Cosmetology

Nail Growth

The matrix, the *Mother of the Nail*, is the part of the nail unit that lies underneath the proximal nail fold just in front of the nail root. The leading edge of the matrix is seen as the lunula. The matrix cannot be seen on all nails, but is generally seen on the thumb, index and middle fingers. The soft, plump cells that comprise the nail plate are developed in the matrix. As they grow out, they lose their inner material and become flat, hard and translucent. The oldest cells are the most compact, making the nail plate harder and denser closest to the free edge. The longer the matrix, the more cells it produces, resulting in a thicker nail plate. Any damage to the matrix can be seen on the emerging nail plate.



The nail plate is held together by strong, interconnecting bands of protein fibers, and is kept flexible by a sticky residue of oils and moisture that constantly flow upward from the nail bed. When this residue transmits through the plate, it creates a matte shine on the surface of the plate. It is also the substance that allows the nail plate to bend and flex under pressure. The plate rides forward on the nail bed in a 'rail and groove' effect - much like a train riding on its tracks. As we mature, the nail bed produces less oil and moisture, and this rail and groove effect becomes evident as vertical ridges in the plate.

Many factors determine nail growth, and each fingernail will grow at different rates. Heredity and health determine how fast the nail plate will grow, although the growth slows as we age. People who use their hands a lot usually experience a faster growth rate.

rate. The thumbnail will grow about 1 1/2 inches per year, and the left thumb will usually grow faster than the right. The index fingernail will grow the fastest, followed by the pointer and ring finger, which grow at almost the same rate. As a rule, the longer the finger, the faster the nail will grow. Nails also grow faster in summer than in winter, and faster during pregnancy. After pregnancy, the rate drops back to normal.

Age also affects the growth rate with nail growth peaking between 10 and 14 years and slowly declining after age 20. Factors that slow nail growth include being immobilized, paralyzed, poor circulation, malnutrition, lactation, serious infections, psoriasis and certain medications. Some people erroneously believe that eating certain foods or using special creams, oils or lotions will increase the growth rate. Although the nail plate requires certain nutrients for proper growth, there is very little evidence that eating a particular food will cause them to grow faster.

Creams, oils and lotions are sometimes sold as 'growth accelerators', although these claims are false, misleading and illegal. No cosmetic product may claim that it can alter or change any body function. These products and others are only for beautifying the nail plate, and only medical drugs can make such claims.

The Building Blocks

The nail plate cells are made of keratin which is a type of protein composed of amino acids. A protein can be thought of as a long chain that can be tied together like the rungs on a ladder to form a 'cross-link'. This cross linkage gives the nail plate strength while the oils and moisture form the 'cement' that hold the nail plate cells together and keep them well lubricated, resulting in a strong, flexible nail.

We equate nail strength with hardness, though in actuality, nails are only strong if they have a combination of strength, hardness and flexibility. If something is strong, it simply means that it can withstand the forces meant to break it. A glass rod is strong, but it can be easily broken. **Hardness** measures how easily the plate is dented or scratched. **Flexibility** determines how much the plate will bend. **Strength** shows how likely the plate is to break under force, and **Toughness** is a combination of these properties. A combination of strength and flexibility create the ideal nail plate.

Many factors can cause changes in the nail plate, resulting in lowered levels of strength and flexibility. For instance, water will absorb into the nail plate causing the cells to expand and change shape. Repeated or prolonged exposure to water can result in dry, split, brittle, or peeling nails.

Solvents will also have a drying effect, although the effects are only temporary. The symptoms of these will generally manifest itself as red, swollen, irritated or itchy skin. Remove the 'allergen/irritant', and the symptoms will disappear. This is why nail technicians across the country recommend their clients wear protective gloves when exposing themselves to excess amounts of water or household chemical solvents (cleaners).

Remember, everything we see and touch is a chemical except for light and electricity. Some chemicals are more hazardous than others, which is why reading the warning labels on the products we use and following the manufacturer's instructions for safe use are imperative. Allergic contact dermatitis from overexposure to any potentially hazardous chemical will remain with us for life. Every time we expose ourselves to an 'allergen', an outbreak will occur.

NATURAL NAIL COMMONLY ASKED QUESTIONS

What products are needed to maintain natural nails?

Products that are needed to maintain natural nails would be base coat, top coat, fingernail file. If you don't use any color at all, you use your base coat to give you the vitamins and the fortifiers that create a strong healthy nail. The top coat seals the base coat, and then just smooth the edges to make sure there is no cracking and breaking off. Use hand lotion to moisturize your hands every day.

How often should I get a manicure?

You should get a manicure every one to two weeks, depending on how much you want to change. Some people's nails might grow faster than others, so depending on how quickly and what you want to do, you can choose according to that. Try to take care of your hands as much as possible.

Should I clip or file my nails?

You should file your nails, because if you're cutting your finger nails, especially dry nails, they can fall off. By filing your finger nails, you have more control with the shape and the length that you want. Filing would go with filing the nails dry.

Why does nail polish last longer on fake nails?

Polish lasts longer on artificial nails, because on natural nails you have more oils in your bed and it comes off a lot easier. It's just like having the oils on your eyelids, when you apply makeup, why does it come off the same thing. It's an artificial nail, which doesn't have the oils in it, so it's going to last three, four weeks.

Do my nails need breaks from nail polish?

Nails need breaks from polish, especially in winter time because you're staining. If you're not using colors and you're using dark colors, your nails are turning yellow. By not using colors, your nail is going to be more healthy. In winter time that is the best time to really take a break from polish.

Does nail polish remover dry out nails?

Nail polish remover can dry out your nails, if it's acetone that is being used frequently on natural nails. Buy non-acetone removers at drug stores that you should be buying as a consumer to take to work or to use at home. If you use acetone, you need to take it off very quickly, and only use it maybe once a week at most.

Hands and nails are two of your hardest working body parts. Think about it: They're constantly working. You're sitting still -- typing emails to friends, scrapbooking, digging around in your purse and performing countless other essential tasks.

All that wear and tear, plus general neglect and exposure to things like household cleaning chemicals, can make your nails look worse for the wear.

Whether we like it or not, neglected nails and cuticles can negatively impact your overall appearance. Well-maintained and natural nails, on the other hand, help you look pulled together, even when you haven't done much on makeup.

"Nice nails let people know you pay attention to details.

Thankfully, you don't need a weekly manicure appointment or even nail polish to keep nails looking good. Keeping them healthy and looking good all it takes is a few minutes of TLC and following some important dos and don'ts:

1. DO clip your nails straight across.

"Always cut your nails straight across. Cutting on a curve or a sharp angle near the tip weakens the nail, which makes it more prone to breaking and splitting.

Also try to clip nails after showering, she says. Nails will be softer and less likely to sustain any snags.

2. DON'T cut your cuticles.

Trimming cuticles may make nails look tidy for a few days, but the skin grows back unevenly and can become dry and ragged. Besides, cutting cuticles can open the door to an unsightly infection since cuticle skin seals out bacteria.

A better solution for overgrown cuticles: Soak fingers in warm water and gently push them back with a towel.

3. DO file nails *before* you shower.

Unlike clipping, it's best to file nails when they're dry. Damp nails are more flexible, and so are more likely to bend and tear during filing.

4. DON'T file or cut them to the quick.

Overzealous filing or cutting makes nails look as if they've been gnawed. You can keep nails short, but at least some of the white portion at the tips. At this length, they won't interfere with daily activities (like holding someone you love), but they -- and you -- will look more beautiful.

5. DO buff nails.

You don't need polish -- or endure the agonizingly slow drying time -- to get a pretty, glossy sheen. Instead, use a two-way buffer. "It only takes a few minutes to do all ten fingers," says Kyees. First, gently smooth the nail with the rough, textured side. Then buff using the soft, smooth side until you see a shiny finish. Repeat every week, however. Overdoing it can thin the nail plate.

6. DON'T use regular lotion.

This advice sounds counterintuitive, but some lightweight lotions contain alcohol, which can dry out and cuticles, making them look ragged.

Cuticle oil hydrates nails and the skin around them and prevents a poor appearance, says Kyees each nail in the morning and in the evening before bed. Massage it into the nail plate and surround it a minute to soak in, then wipe off any excess.

7. DO wear gloves when doing housework.

Cleaning detergents and chemicals can make nails brittle and dry. Likewise, the perpetual wetting of nails can also leave them prone to breakage, Dr. Gmyrek says. (Gloves protect nails, but also help protect hands from being damaged by harsh chemicals.)

8. DON'T peel off polish.

If you do paint your nails for a special occasion, remove it with a non-acetone remover as soon as it begins to chip or peel. Nicked polish not only looks messy, it can encourage picking and peeling which will remove the surface layer of nail along with the polish, making the nail plate look flakey.



Clean, neat and natural nails, on the other hand, help you look pulled together, even when you haven't done your hair or put on

makeup.

Avoiding Allergies

Fragrance ingredients are the most common cosmetic allergens. In fact, sensitivity to preservatives (necessary for proper shelf-life) and fragrances account for most cosmetic-related skin allergies. Of course, other types of ingredients may also cause sensitive clients to develop symptoms such as redness, itching or other signs of irritation. Simple irritations usually reverse themselves when exposure is discontinued. However, symptoms may worsen with repeated exposure or could develop into skin allergies. Clearly, all nail professionals should understand the importance of avoiding product overexposure.

Skin allergies can occur with any type of artificial nail enhancement. Often, the allergy begins as a slight itch or reddish area, or a spot that feels 'warm'. If the facial area is touched with contaminated fingers, the skin might become irritated near the chin or around the eyes. On the fingernails, if ignored and overexposure continues, these symptoms can become an annoying itch of the nail beds or water blisters around the cuticle area, sidewalls or fingertips. If ignored still, the symptoms might spread to hand or wrist. Luckily, all of this is easy to avoid - if you understand your products and use them wisely.

Which type of enhancement products can cause skin allergies? All of them can! But "can" is different than "will" -- in most cases, these allergies can be avoided and the nail professional is the key! UV gels, liquid monomers, wraps and tip adhesives share several ingredients capable of causing skin allergies. What's the reason for these skin reactions? In a nutshell, the culprit is *overexposure* caused by *prolonged* or *repeated* skin contact and usually many months, sometimes years of exposure.

For instance, a sticky, water-resistant product remaining on the skin for long periods may lead to overexposure via *prolonged contact*. Or, constantly touching uncured gel or liquid monomers on a brush handle may create overexposure by *repeated contact*. Touching the brush flags to the soft tissue of the eponychium, sidewalls or under the free edge is common ways of overexposing clients. No matter which type of enhancement product is used, each shares the same general

requirement - they must be cured properly if they are to be used safely. In short, skin contact must be avoided with uncured gels, monomers, resins and adhesives.

Below are a few of the main reasons enhancement-related skin allergies occur and some useful tips for avoiding them.

Cause #1: UV gels are usually very sticky, adhering tenaciously to brush handles, tabletops and containers. This can make it more difficult to avoid prolonged and repeated contact. Also, UV light is required to harden the gel. The various types of bulbs (used in UV lights) quickly begin to emit less and less UV light. After a while, they don't produce enough UV light to properly cure the product. After 3-6 months (depending on your usage) these bulbs emit less than half the UV light of a new bulb - even though the bulbs continue to emit UV visible blue light. This often fools nail professionals. UV light is *invisible*, so you cannot see when the intensity is lower. Inexpensive UV bulbs (often with lower quality) may save a little money, but will leave uncured (un-reacted) ingredients in the product.

On the other hand, some gels heat up excessively, causing the client to jerk their hand from the light. Shortening the time under the light produces the same effect as using old UV bulbs - incomplete and improper cure of the enhancement. What's the result of incomplete cure?

Un-reacted ingredients can be left inside the enhancement. These are ingredients that normally would react and become a permanent part of the artificial nail. Un-reacted ingredients are usually fairly mobile. In other words, they can migrate through both the artificial and natural nail, until reaching the soft, living tissues of the nail bed. Such allergies often cause clients to complain about "itchy" or "warm" nail beds.

Finally, it is very important to avoid soft tissue contact with the gooey surface layer. This layer of 'goo' is caused by the effect of air on curing the gel. The air above the gel prevents the product from properly curing on the surface. This annoying phenomenon is made worse by weak or old UV bulbs. This gooey layer contains un-reacted ingredients which can cause skin problems, so always avoid skin contact. Alcohol or other solvents used to wipe away this layer carry the

allergens to your fingers through the cotton or pad, increasing the potential for skin overexposure.

Prevention: Avoid skin contact and keep implements and containers clean. Keep table area free of UV gel and dusts. Be especially careful to avoid contact with the goeey surface roll-off. It is best to use a plastic backed pad to prevent product ingredients from soaking through to the skin. Avoid laying your arm(s) in the dusts or where you wipe your brush. Freshly hardened dusts still contain small amounts of un-reacted ingredients.

Use only high quality UV bulbs from a reputable source and replace them often - especially if used every day. Clean the bulbs daily to prevent dusts and/or product build-up. Apply thinner layers of gel to prevent excessive heat (exotherm). Thinner layers will allow the product to cure more completely. Don't shortcut the recommended time client's hands are in the UV light and make sure they are positioned correctly by following the instructions provided with the unit.

Cause #2: Overexposure to monomer liquids can cause skin allergy as well. Odorless products are more likely to cause client sensitivities than the traditional, odor-based enhancement products. Odorless products must be used with a dry bead consistency, but are often used with too wet a mix ratio. As with all liquid/powder systems, the ratio of monomer (liquid) to polymer (powder) must be correct. A medium consistency (slightly on the dry side) is best.

Avoid using enhancement products with a wet mix ratio. The powder carries an ingredient needed to completely cure the enhancement. Using too little powder (equals working wet) will leave un-reacted ingredients inside the enhancement. Different companies use varying amounts of curing agents in their powders, so only use powders that are specifically designed for that monomer liquid. If you don't, your mix ratio will be out of balance. As with UV gels, un-reacted ingredients can migrate to the nail bed and cause itching. Allergic skin reactions, i.e. 'water blisters' around the nail plate area can result if brush flags touch the skin repeatedly. Skin contact can also occur while 'cleaning up' around the sidewalls or under the free edge with the wet brush.

Prevention: As with UV gels, keep brush flags off the soft tissue to avoid transferring monomer liquid to the skin. Leave a tiny margin between the product and the eponychium and sidewalls. Ensure you are always using the proper mix ratio - never wet! Don't use a brush soaked with monomer to smooth the enhancement. Always use the correct powder with the monomer liquid. Keep your table free of dusts and avoid laying your arms on the towel where you wipe your brush. No matter what you use, all nail professionals should wash their hands after each client. Also, always use a moisturizer to ensure hands are properly conditioned.

Wraps and Glues: These contain ingredients found in other types of systems, so they can cause skin allergies (as well). Even so, they are much less likely to cause allergies and very few clients develop sensitivities to them. Why? Mainly, because they react almost instantly in the presence of moisture, so only trace amounts of un-reacted ingredients remain. Simply avoiding repeated direct skin contact is enough to avoid overexposure. Glues are frequently the first product that is suspected when clients complain of itchy nail beds, but they are seldom to blame.

Remember: Avoid over-filing the nail plate. The top layers are composed of very hard cells designed to protect and seal the underlying layers. If filed away with too aggressive of a technique, the nail plate becomes more susceptible to penetration by un-reacted ingredients. So, keep the plate thick and healthy! that's every nail professional's most important job.

Skin allergy is possible with many types of cosmetic products. Luckily, allergies to nail enhancement products are easy to avoid. But, you must have the correct information and understand how to properly apply your knowledge. If you understand the causes, you will be able to avoid product related skin allergies. The *key* is to reduce product exposure to safe levels by avoiding skin contact. Client allergies to nail enhancement products usually take many months to develop, so there are many chances to prevent skin contact. Nail professionals must also take care to avoid overexposing themselves and becoming sensitive. In short, avoid *prolonged* and/or *repeated* contact to all nail related products, while always using them safely and wisely. That's the best way to ensure that your clients will love their nails.

Once allergic, we are allergic for life, so the best way to alleviate the problem of skin related allergic reaction, is to soak off the enhancements in an approved remover, perform a natural nail manicure, and prescribe a Nail Toughener (such as Toughen Up by Creative Nail Design) that will help to give the nail plate more strength by adding additional cross-linking molecules to the nail plate until it grows out on its own.

Allergic Reaction

Learning how to identify and prevent overexposure to nail chemicals for our clients and ourselves should be a top priority. Overexposure that results in allergic reaction can be prevented. It all starts with paying specific attention to our preparation, application and finishing techniques, knowing our products and using ventilation in the salon.

Nail technicians and their clients are exposed to a wide variety of potential allergens in the salon. We wipe our monomer soaked brushes on the table towel and then rest our arms in the same spot. We use our fingers or our wet brush to clean off any product that has over-run the clients cuticle or sidewall lines. We allow nail dust to collect on the skin of our hands and arms, while our arms rest on a wet, dusty table towel. We use drills at higher than recommended speeds which can *throw* the nail dust in our faces and into our breathing zone. If we wear masks to protect ourselves from vapors or dusts, we rarely change them, or we wear the wrong type mask. These practices, among others, can cause overexposure to potentially harmful chemicals which will result in sensitivity and allergic reaction.

This photograph is of a client that has experienced a severe allergic reaction to acrylics. Note the dry, red, peeling skin around the cuticle and sidewall lines. The lifted nail plate will grow forward as new cells



replace the old.	
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Factors contributing to irritation include:

- The chemical properties of the substance (for example, is it an acid, an alkali, or a salt).
- The amount and concentration of chemical coming into contact with the skin.
- The length and frequency of the exposure.

It is this type of allergic reaction that is most evident in nail technicians and their clients.

What can we do to prevent allergic reaction?

1. Never touch the brush hairs with your fingers, or allow the brush to touch the client's skin.
2. Never apply product too wet or allow the wet brush to touch the prepared nail plate.
3. Use disposable towels when wiping your brush, and discard them after use and before filing.
4. Leave a tiny margin all around the cuticle and sidewall lines free of product. This will prevent overexposure and allow for air-tight retention of product to the nail plate.
5. Wear a long-sleeved smock to prevent dusts from settling on your skin.
6. Wear a mask specifically designed for dusts when filing, and change it often.
7. Install a local exhaust ventilation system to rid your salon of potentially harmful vapors.
8. Use dispenser bottles that have small openings only large enough for the brush to enter.

9. Monomer soaked pads should be placed in a sealed bag before being placed in the trashcan.
10. Monomer soaked or dust laden towels should be removed from the table top and laundered separately from other salon laundry.
11. Trashcan liners should be changed daily.
12. Never pour more liquid into your dappen dish than is needed for the type of application you are performing.
13. Wear protective glasses to prevent dusts or flying debris from entering and damaging your eyes.
14. Never smoke, eat or drink at the nail table. Vapors and dust can settle on your food or in your drink, and the 'flick of a Bic' can cause a spark that can ignite flammable airborne vapors.
15. Never let dust accumulate.
16. Always keep MSDS on all products used in your salon.
17. Read and follow the product manufacturers application instructions and the warning labels on your products.
18. Store nail chemicals in a cool, dark place and away from sources of heat or flame. Store nail chemicals in a separate location from hair chemicals - the vapors of some of these products are not compatible with each other, and can often create a undesirable and potentially hazardous chemical reaction.

As nail techs constantly come in contact with nail dust, gels, acrylics, primers, polish removers, they are susceptible to allergies and should take adequate precautions to protect themselves. Clients on the other hand can develop allergies to some nail treatments and products like gels, acrylics, removers which may cause skin and nail damage.

Some tips that nail techs should keep in mind to avoid chemical over exposure to them and clients are:

1. Keep your salon clean use clean linen for each client, see that all equipment is sterilized before and after use, trash bags are changed daily.
2. Maintain personal hygiene wear appropriate clothing to protect your skin from nail dust, wear a face mask to keep away dust and odors frequently changing it and never treat your worktable like a dining area. Undesirable chemicals may pass into your food and cause adverse reactions.
3. Carefully prepare your work area before each client appointment so that you do not end up mixing the wrong chemicals in a hurry and causing damage to client nails.
4. Use and store all nail care products as per the manufacturers instructions and do not try to mix unadvised quantities as this may cause mishaps like burns on the skin and damage to the nail plate.
5. Only mix the amount of liquid you will need for application and never more. This will avoid wastage as well as limit the amount of harmful vapors which will be emitted.
6. Keep your spa well ventilated to release any vapors and odors which may linger on after a nail job.
7. Keep a small area around the cuticle free of any product to allow the application to settle firmly and avoid over exposure of chemical on the nail plate.
8. Do not keep wet brushes on towels or indiscriminately wipe them with whatever comes your way. Instead use disposable towels.

Maintaining these basic hygiene standards will go a long way in preventing any allergies or chemical over exposures to yourself and your clients. High standards will also add immensely to your appointment book.

Simple Tips for Natural Nail Care

Nails which are well cared for make a positive impression on your personality. One of the most delicate parts of our body, nails are constantly exposed to

chemicals, water, heat, cold and other elements of nature. This tends to make them brittle, rough and even prone to breakage at times. However, everyone does not have the time or inclination to visit a nail spa each time to get gorgeous nails.

Nail care can be done even at home with some simple tips and techniques listed below:

- Always keep your nails clean and well groomed. Keep a toothbrush in the shower and use on your nails each time to brush gently over and under the nails. Apply a cuticle oil/cream last thing in the night to moisturize your nails.
- Be kind to your hands and nails. Use gloves while performing tasks like dishes, gardening or other cleaning chores around the house. This will keep the dirt off the nails and prevent them from breakage and discoloration due to chemical exposure or while performing tasks like chopping colored fruits and vegetables.
- Keep your nails a reasonable length, depending on your daily schedule and tasks. Too long will cause frequent breakages and too short may make you look un-groomed.
- Keep your nails painted either with transparent paint for a shiny and healthy look or with some pastel shades which go with most outfits. This way you will be saved from painting your nails if you urgently have to go out. Also, always apply a second coat of paint after the first one has completely dried out.
- Use an acetone free remover to get the nail polish off. Acetone tends to dry out cuticles and negatively affects the health of your nails.
- Keep a home manicure and pedicure kit handy at home. Orangewood sticks, nail clippers, file with a minimum 240 grit, nail brush, manicure and pedicure bowl. These will help you get decent nail maintenance at home and keep your nails healthy. Remember to regularly replace these

implements and sterilize those which need to so as to prevent bacterial infection.

- Do not use your nails as tools to open bottles, letters just because you are in a hurry. This will cause long term damage. Instead use bottle openers, letter openers handy.
- Carry a hand and nail cream enhanced with Vitamin E and use after a hand wash or when your hands feel dry. This will go a long way in maintaining beautiful nails and hands.
- If you notice any nail infections or abnormality on your nails, do visit a nail technician to get the correct advice and repair done. Dont try do it yourself damage control tricks.
- Try to visit a nail spa at least once a month to keep yourself up to date on the latest nail care tips.
- Last but not the least, follow a healthy diet regimen. Avoid fried, oily stuff, take in more of fruits and greens and you will be in the best of health. And so will be your nails.

MMA, the FDA and You

What is MMA? The correct terminology is **Methyl Methacrylate** - MMA for short. MMA has been prohibited for use in the nail industry since the late 70's.

Why should MMA not be used? There are four main reasons:

1. MMA nail products do not adhere well to the nail plate. To make these products adhere, nail technicians often shred up (etch) the surface of the nail. This thins the nail plate and makes it weaker.
2. MMA creates the hardest and most rigid nail enhancements, which makes them very difficult to break. When jammed or caught, the overly filed and thinned natural nail plate will often break before the MMA enhancement, leading to serious nail damage.

3. MMA is extremely difficult to remove. Since it will not dissolve in product removers, it is usually pried from the nail plate, creating still more damage.
4. The FDA says *don't use it!* This is clearly the most important reason. The FDA bases their prohibition on the large number of consumer complaints resulting from the use of MMA nail enhancements in the late 70's and they continue to maintain this position today.

It is the responsibility of all professional nail technicians to protect the health of their client's natural nails. A good place to start is by using responsibly formulated products and to learn safe and proper techniques.

How do you know if your salon or technician is using MMA?

- MMA has an unusually strong or strange odor which doesn't smell like other acrylic liquids. Odor is present during application and when filing cured product (for fill-ins or repairs).
- Enhancements which are extremely hard and very difficult to file even with coarse abrasives.
- Enhancements that will not soak off in solvents designed to remove acrylics.
- Cloudy or milky color when cured.

Additional warning signs though less definitive:

- Low price of fills and full sets (MMA cost 1/3 of EMA)
Dust or ventilation masks used (many technicians use dust masks today who do not use MMA)



MMA Damaged Nail

Manicure Procedures



There are a few other items that you may wish to use during your manicure, all of which are optional:

- **Cuticle Remover:** These cosmetic solutions will aid in softening the cuticles and may contain 2-5% sodium or potassium hydroxide and glycerin's. Apply to the cuticle area after filing and before soaking in the fingerbowl.
- **Nail Cleansers:** Usually a type of detergent (scrub) in liquid form that is added to the water in the fingerbowl to aid in soaking and cleansing the nail plate.
- **Cuticle Oil, Lotion or Creams:** Any combination of essential oils that soften and lubricate the skin and nails.
- **Nail Bleaches:** These cosmetics contain hydrogen peroxide or organic acids that can be applied over and/or under the free edge of the nail plate to remove stains. Sometimes they work -- sometimes they don't!
- **Base Coat, Enamel color of choice, and Top Coat.**
- **Polish Dryers:** These products can be sprays or Top Coat enamels and are designed to quickly dry the surface layer of enamel. The solvents in nail enamel must evaporate in order for the polish to dry. When Polish is applied, the solvents on the surface begin to evaporate and the solvents on the bottom begin to move upward, and the surface begins to harden.

The solvents have to diffuse through this hardened surface and evaporation slows down. Polish dryers repel this thickening layer, pulling the solvents into itself. This action is much like pressing down on a wet sponge, or wringing our a wet rag. The polish is not totally 'dry', but is simply much drier than it was immediately after application. It takes a full hour for the enamel to be free of solvents and fully hardened.

- **Aromatherapy Oils:** For a relaxing mood or to relieve stress.

- **Sloughing Lotions:** To aid in exfoliation of rough, dry skin.

Generic Acrylic Nail Application Guidelines

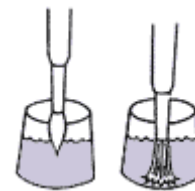
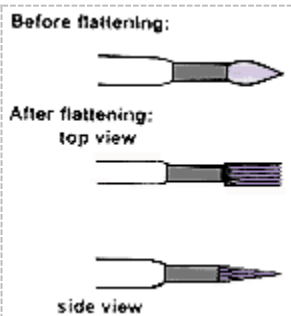
Nail product manufacturers spend a great deal of time in research, development and testing prior to releasing a product. The type and combination of chemicals in any given nail product line are designed to work together as a complete unit in order to achieve the best possible results. Every manufacturer's line of products has their own nuances and because of this, mixing products from different lines may result in various forms of service breakdown. For long-term wearability, always use complete systems when applying artificial nail enhancements. Always follow the manufacturer's instructions and read and understand the warning labels on all your products.

Proper preparation prevents problems and is vital for achieving optimum results and preventing service breakdown.

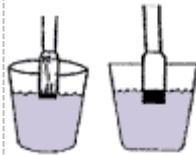
Application Procedure

Pour a small amount of monomer into a dappen dish -- use only what you will need for the particular service you are performing. Totally immerse and 'swish' your brush in the monomer to thoroughly wet the hairs and to remove any trapped air that may result in bubbles in the finished product. Air bubbles compromise the strength of the product and can lead to service breakdown.

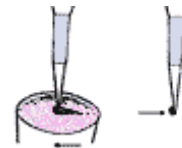
As you remove the brush from the dish, flatten hairs on both sides to shape the brush for sculpting and to drain excess liquid from the brush. Now you are ready for sculpting.



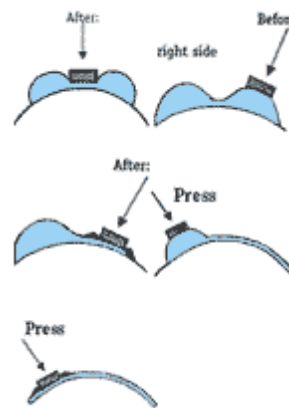
More monomer = a larger bead, less monomer = a smaller bead. Dip the brush into the monomer according to the desired bead size. For a small bead, slide the flattened brush down the side of the dish and submerge only the tips of the flags (the darkest hairs) into the monomer. For a larger bead, moisten the entire flag area of the brush.



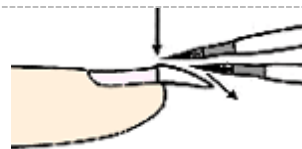
Draw a line in the powder to the depth of the liquid line on your brush. The longer the line, the bigger the bead. Allow the monomer to surround the polymer particles. The bead should be medium in size and a medium-wet consistency. A medium-wet mix ratio will not immediately 'melt' down; it will have a slight 'textured glass' appearance, and maintain its shape when placed on the nail, tip or form.



Place the bead at the smile line and in the center of the natural nail. Press the bead with the flags of the brush to flatten and separate the bead, then stroke to the extension edge. Press either side of center to flatten the bead and stroke to the extension edge, being sure that the level of product is evenly distributed. This section will be higher at the smile line (upper arch) and tapered to all edges.



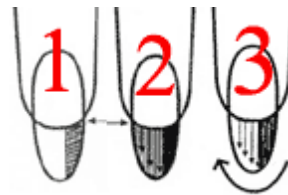
As you smooth with the brush from smile to extension edge, it is important to 'follow-through-' with the stroke in a downward motion.



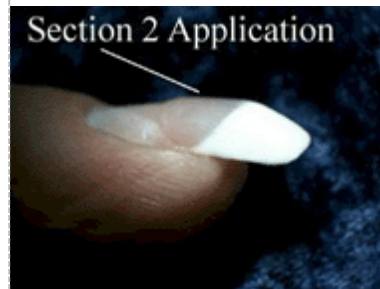
With the entire section 1 covered from side to side with product, the remaining 2-2 1/2 minutes of working time can be spent on perfecting the smile line for symmetry.



Perfect the line when the product is very wet. Use a fluid motion to actually **draw** in the smile. Use baby presses to perfect the line and to ease the product further into the corners of the smile. Use 'prep' on a *dedicated prep brush* to clean up the smile line on the nail plate if needed.



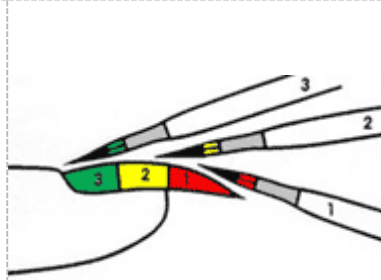
Pick up a medium size, medium-wet consistency bead (pink, clear or natural) and place on the nail surface just behind but still touching your previous section. Press the bead to flatten and stroke to smooth and blend with section 1. Continue in this manner until the entire section is blended and smooth.



Pick up a small, medium-wet consistency bead and apply to section 3 in the same manner. Be sure this section tapers into the nail plate to avoid a ridge of product at the cuticle line. Leave a tiny margin all around the cuticle and sidewall line free of product. This will allow the product to properly shrink when cured (polymerized) and create an air-tight seal to the nail plate.



Pressing and smoothing will assure total product control, eliminate bubbles in the product, allow for complete contact of the product to the natural nail plate, and eliminate excessive filing. Work with the brush flat, and keep the flattened surface parallel to the section you are working on. This means that the angle of the brush will change with each section.



Finishing

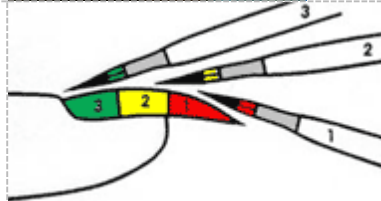
Using a 180 or 240-grit soft file, shape the free edge and sidewalls to the desired form.



Smooth the surface of section 1, perfect the 'C' curve and taper to a thin edge



Perfect the upper arch of section 2 and blend smoothly with section 1.



Blend cuticle area flush to the natural nail, but do not over-file the natural nail. Perfect sidewalls to a thin edge and blend with section 2.



Remove all dust filings.

Apply a small amount of cuticle oil to all 10 nails.
Massage into the cuticles and the overlay.



With a 360-grit padded buffer, buff the oil into the surface of the overlay to remove scratches and plasticize the surface.



Buff to a high gloss shine with a 3-way buffer: black side, white side, then the gray side.



Ask the client to wash her hands to remove all traces of oil and buffing dusts.

You may skip step 8 if you prefer to use an acrylic sealer rather than buffing to a shine. If the client has requested enamel, proceed to perform The Perfect Polish. Always book a 2-week maintenance appointment prior to the client leaving. Regularly scheduled maintenance appointments prevent service breakdown and needless or costly repairs.

Discard or sanitize files, dry and store them in a sealed container with the clients name, address, phone number, profile card and any other special instructions for their next visit.

Special Notes


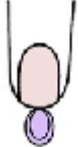

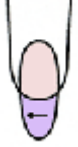

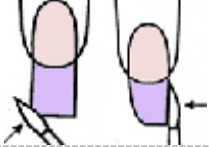


- Never touch your brush to the clients prepared nail plate or to the skin. Doing so may result in **overexposure and allergic reaction** from repeated and prolonged contact to the chemicals.
- Never apply product that is too wet. Too wet a mixture will not properly polymerize and the excess monomer will be absorbed into the nail plate which may cause an allergic reaction that could result in nail plate separation.
- Never over-file the natural nail plate as this practice will remove too many vital nail plate layers.
- Heavy grit files, heavy-handed filing or high-speed drills can heat the nail bed in excess of 150° F, resulting in a burn to the nail bed.
- Never smoke, eat or drink at the nail table to prevent cross-contamination between your food and the products. Smoke will deposit a layer of nicotine (oil) on the nail plate which may cause lifting. Your products are flammable, so keep them away from heat sources and sparks or flame.
- Proper preparation and application will prevent service breakdown problems.
- Work in a well ventilated area. Proper ventilation will remove airborne dusts and vapors from the building. Air conditioning only *circulates* the existing air in a room or space.
- Wear protective clothing to prevent dusts from settling on your skin.
- Wear a protective mask when filing to prevent inhalation of acrylic dust filings, and change it often.
- Take frequent breaks during the day to prevent the possibility of repetitive stress injuries. The application instructions are the same for a natural nail overlay and for an overlay on an already applied and prepared tip.

Sculpting on a Form

Sculpting on a form requires a different technique in Section 1. When working on a form, Section 1 is sculpted on a slick 'cool' surface. Since there is no body heat coming through the form, it will slow down evaporation and set time. The product

will seem wetter and take more time to get to a gel-like consistency where it can be pressed and smoothed with confidence. You must use delicate pressure when working with the product in this initial stage.

Section 1 Sculpting

Place a medium size medium-wet bead onto the form just in front of the natural free edge.	
Press the center of the bead to flatten and spread.	
Press the bead to the right sidewall.	
Press the bead to the left sidewall.	
Use the side of your brush to perfect the sideline and to create the lower arch. Perform this same procedure on the other side.	
Push the corners in at an angle to narrow the extension edge and/or to create an oval or almond shape.	
Using the tip of the brush to clean up the extension outline to a crisp line.	
Follow the '3-step' spread & smile technique to perfect section 1 dimensions and to 'tuck' the corners to create a deep smile.	

Complete the application in Sections 2 & 3 by following the procedures for these sections in the Overlay instructions.

Generic Maintenance Procedures

Single Color Maintenance

Should you prefer this method, or your client consistently wears colored enamel, follow these generic guidelines:

- Remove all traces of nail enamel with a lint-free wipe.
- Perform a manicure, push back and remove excess 'true' cuticle. Do not nip or clip live skin; cutting live skin can lead to infection.
- Using a 180 or 240 grit file, remove the shine from the existing product and reduce the level of thickness by 1/3rd. During this filing process, all areas of lift should be filed away and blended to the natural nail.
- Remove the shine from the natural nail using a 240-grit buffer or file. Hold your file flat to the surface to reduce the possibility of 'trenching' the natural nail by removing too many vital nail plate layers.

This photo shows all areas of lift filed away, the product reduced by 1/3rd, and the prep product applied.



- Wash hands and scrub nails with a soft nail brush or toothbrush, rinse and dry.
- Apply prep to the natural nail only.

- Apply one thin coat of primer to all 10 nails being sure to apply only to the natural nail plate. (If primer is allowed to touch existing product, it can cause the product to yellow.) Allow the primer to dry to a chalky white.
- If filling in only the re-growth area, pick up a small, medium consistency bead and place it off center on the natural nail. Flatten the bead by pressing it into the nail plate; this will spread the bead toward the sidewall line, then stroke to blend with the existing product.
- Pick up a second small, medium consistency bead, and place it immediately next to the previous application. Press to flatten, then stroke to blend into the previous application and to the already applied fresh product.
- Complete this application on all 10 nails.
- To finish, follow the finishing procedures for a new set.

Pink & White Maintenance

For the perfect acrylic French Manicure, follow these generic maintenance procedures:

- Follow the previously listed preparation steps of 1 - 7; however, reduce the existing product by 2/3rds, and flatten the existing arch (stress area). You may also choose to trench out the stress area arch (smile line) by holding your board at a 45° angle to the stress area and filing a trench across the nail from sidewall to sidewall. Be sure not to file so deeply into the stress area as to trench the natural nail.
- Wash hands and nails with a soft nail brush or toothbrush, being sure to remove all traces of dust, then rinse and dry the hands and nails.
- Apply prep to the natural nail only.
- Apply a thin coat of primer to the natural nail only and allow to dry to a chalky white.

Allow primer to dry to a chalky white. If the system you are using does not require a primer, you may skip this step.

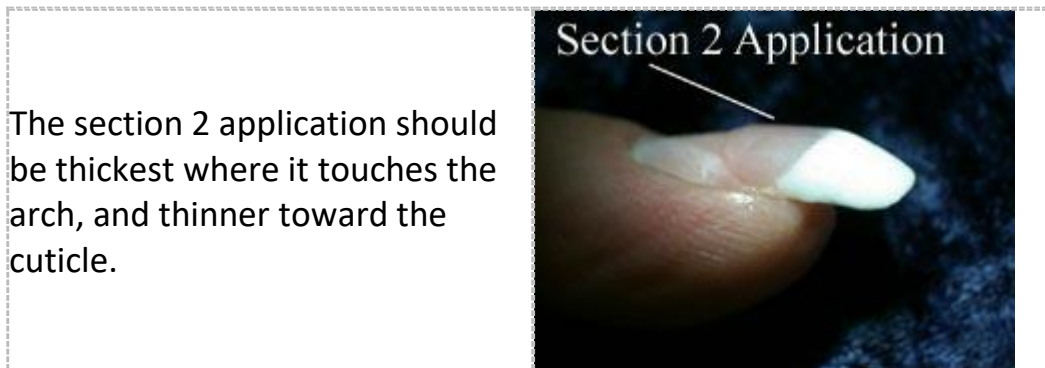


Pick up a medium size, medium consistency bead of white tip powder. Place it immediately at the natural nail smile line. Flatten and spread this bead to both sides of the extension, then stroke to the existing free edge. Use the tip of the brush to perfect the smile line to a smooth, even form.

The stress area arch should be the highest (or thickest) part of the nail.



Pick up a medium size, medium consistency bead of pink, clear or natural and place it immediately behind but touching the smile line of section 1. (Use the height of the arch to swipe the product from the brush onto the nail plate.) Press to flatten the bead into the nail plate. Press and stroke each side of the bead up to, but not touching, the sidewall line. Stroke to blend with section 1.



Pick up from 1 to 3 tiny medium consistency beads and place them, one at a time, in the center and to each side of section 3. Press to flatten and stroke to blend with section 2. Leave a tiny margin all around the cuticle and sidewall free of product. This margin will reduce the chance of lifting from skin oils and allow the product to properly shrink when cured and create an air-tight seal to the nail plate.

Many technicians have told me that in leaving this margin, the client feels they have not received their money's worth. Explain to them that this practice leads to allergic reaction due to overexposure, and/or lifting problems.



Note: You may wish to apply the white tip product to all ten nails prior to applying sections 2 and 3. This will allow section 1 to set-up and prevent the possibility of compromising the crispness of your newly created smile line.

Finishing

It is during the finishing steps that one perfects the shape, form and dimension of the completed application. If you have practiced precise placement of each section and maintained the dimension of the product in each section, filing time is greatly reduced.

Using a 240-grit file, begin by perfecting the extension edge, then the sidewall lines to the desired form: square, rounded square, oval or pointed.

If you perfect a technique where you perform the steps in the same sequence nail to nail and finger to finger, the finished nails will be uniform in shape, form and design.



Perfect the overlay surface with the 240-grit file beginning at the extension edge and work back toward the cuticle line.

Hold your file flat to the surface of the overlay and file from the center of the nail outward toward the edges. All edges should be thin and beveled.

Filing in this manner will allow the arch to remain thickest down the vertical center and across the stress area with all edges thin and beveled.



Use a 240-grit soft, padded buffer (I like the Koala Buffer by Creative) to smooth and perfect the surface and to remove any deep scratches. Remove all traces of dust filings. Apply a drop of cuticle oil (I prefer Solar Oil) to each nail and massage into the cuticle and overlay.

Use the 1200-grit side of the Koala Buffer to buff the oil into the overlay. Oil buffing will plasticize the surface of the overlay and begin the sealing process.

The surface is buffed to a high shine. The arch placement is correct, all edges are thin and beveled, and the length is concurrent with the client's active lifestyle.



You may prefer to apply a coat of acrylic sealer rather than buff with the 3-way buffer. If you prefer to do this, it is still advisable to oil buff the surface. Buffing with oil performs the same as waxing your car. It removes tiny, invisible scratches, allows light to reflect from the surface, and aids in rendering the surface impervious to solvents.

For best polishing results, never shake the bottle; turn it upside down and gently roll between the palms of your hands. Shaking will allow bubbles to form in the polish and will transfer these bubbles to the nail surface.

Always apply thin coatings, allowing a full minute between coatings for each to properly dry (cure).

After nail enamel has cured, apply a drop of nail and cuticle oil to each finger and massage into the cuticle and enamel coating. This will help to prevent cracking and chipping of the polish, and will lubricate the molecules of the overlay to prevent service breakdown.

Instruct your client to apply cuticle oil to the cuticles and overlay at least twice daily; more if her hands are in water a lot or she works with paper or textiles. Water, paper and other textiles can remove vital oil and moisture from the nail plate, the surrounding cuticle and from the overlay. Reduced moisture levels will allow the natural nail plate to curl away from the product at the free edge.

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