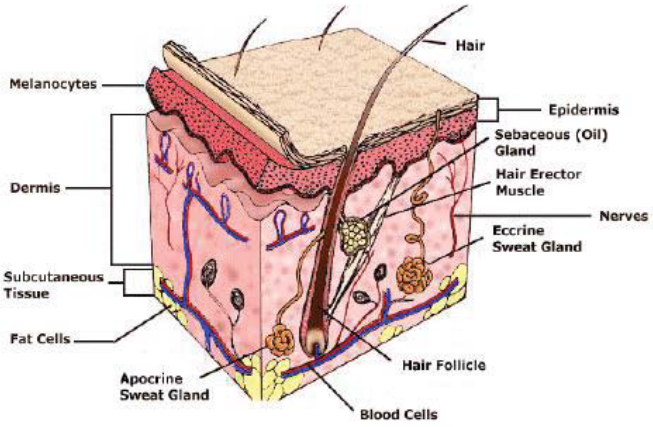
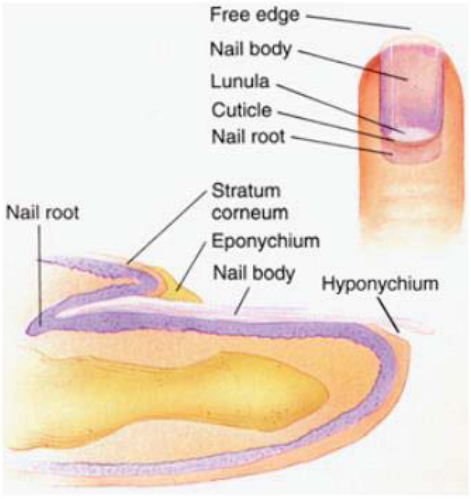
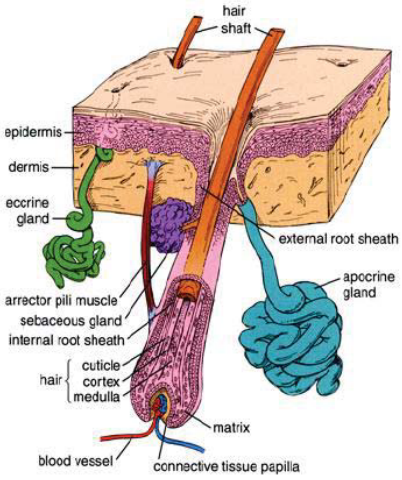
CHEMICAL MAKEUP OF HAIR, SKIN, AND NAILS

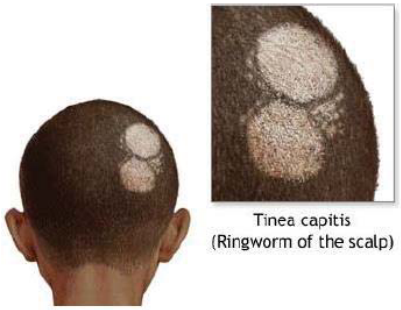
(5 Hours)

In this profession, it is very important to understand the chemical makeup of hair, skin, and nails in order to ensure the safest and most effective treatment for your clients. As in any cosmetology profession, a facial specialist will be faced with a variety of clients and scenarios, which can be handled with the proper treatments and knowledge.









Tinea capitis
(Ringworm of the scalp)

The Hair

Hair is an outgrowth of skin, but has no sense of feeling due to lack of nerve endings. Hair is made up of keratin, sulfur, carbon, hydrogen, oxygen, and nitrogen. Hair follicles extend into the dermis layer of the skin. Not only does hair add the cosmetic appearance, but it protects the body from ultraviolet rays, foreign particles, and heat loss. The layers of the hair are as follows (inside out): the medulla, the cortex, and the cuticle. The medulla is the core of the hair, which provides wave or curl. Someone with a lack of medulla cells is more likely to have fine hair. This layer is composed of round cells. The cortex is the inner layer that gives hair its color, strength, and durability. This layer is made up of many parallel, twisted fibers of hard keratin. The cuticle is the outside layer, which is composed of scale like cells. Chemicals, such as straightening relaxers, hair colors, and perms, raise these scales so that solutions can enter. The hair is protected by inner and outer root sheaths which constitute the follicle wall or structure itself. There are two divisions of hair: vellus and terminal. Vellus hairs are an appendage of the sebaceous glands, receiving nourishment from the gland itself. A vellus hair growing from the love of a sebaceous gland, if stimulated by the glandular system, may develop into a terminal hair. Terminal hair is that which terminates, or connects, to a dermal papilla.

There are three major physiological changes that take place during a woman's life which can cause hair growth: puberty, pregnancy and menopause. Hypertrichosis is an abnormal growth of hair on any part of the body which is more than that usually seen in individuals of the same sex, age, and race as the person under consideration. There are three causes for excessive hair growth: congenital, topical, and systemic.

Congenital growth is the genetically predetermined pattern of hair growth which a person is born with.

Topical growth is caused by any topical stimulation that increases the blood supply and is capable of causing mild to moderate acceleration of hair growth.. Systemic growth is caused by the distribution of certain hormones within the body's complex system which are capable of stirring germative cells to life or accelerating current hair growth.

There are several conditions on the scalp, which can be difficult to identify without previous knowledge. Tinea capitis is a fungal infection of the scalp. Symptoms may include itching in the area, small black dots on the scalp, areas which appear bald due to hair that has broken off, lesions filled with pus on the area, or scaly inflamed lesions on the scalp. The most common form of treatment for this condition is oral medication.

pH of the Hair, Skin, and Nails

pH is a unit of measurement which measures the amount of acid or alkali in water based solutions. The scale of pH ranges from 0-14 and is measured in increments of 10. Five is the average pH of hair, skin, and nails, whereas seven is neutral. The average pH is not of the hair, skin, and nails itself, but of the protective layer of oily secretions that coats and lubricates the surface of the hair, skin, and nails, also referred to as our acid mantle. The scalp's oils are what keeps hair shiny and nourished. The reason that it is common to see ends of the hair dull and less shiny than the roots

is because the acid mantle only reaches so far and does not necessarily reach all the way to the ends. In general, products with a pH of about 4.5 – 5.5 are acid balanced products, and maintain a closely compatible environment with that of our natural acid mantle. When high pH products come in contact with the hair the solution is absorbed through the cuticle layer into the cortex layer of the hair. This imbalance of pH causes the hair to swell, which forces the cuticle layers to be stretched. This puts the hair into an unnatural state and more than likely causes breakage. Therefore, shampoos, conditioners, hair colors, and tints all work with the right amount of pH and other ingredients in order to be the most effective.

pH Value	Times acidity or alkalinity exceeds that of pure water (7.0)
Acidic 0	10,000,000
1	1,000,000
2	100,000
3	10,000
4	1,000
5	100
6	10
Neutral 7	1
8	10
9	100
10	1,000
11	10,000
12	100,000
13	1,000,000
Alkaline 14	10,000,000

The Skin

The work of a Facialist consists of spending many hours in skin-to-skin contact. Therefore, it is of your best professional's interest to become familiar with certain common skin disorders and know how to act in relation to them. If you have any doubts concerning any skin condition you may come across, it is in everyone's best interest to refer the patron to a dermatologist. By simply explaining that you are not a doctor, but that you think that for his/her own protection, you feel that he/she should get a qualified medical opinion regarding the pre-existing condition. Any treatment on top of an unknown condition could result in a unappealing or harmful reaction.

The skin is the largest organ of the body and is a necessity for survival. It serves many functions of the body: protects the body from foreign substances and UV rays, excretes waste products, provides sensation, regulates body temperature, reserves blood, and supports underlying body tissues. It weighs about 9 pounds on average and its thickness can vary from 1/32 of an inch to 1/8 of an inch on different areas of the body. On average, the skin is thinnest on the eyelids and thickest on the palms of the hands and the soles of the feet. The skin is made up of two layers: the epidermis and the dermis. The epidermis is the surface layer of the skin as well as the protective covering of the body. The epidermis consists of four types of cells: Keratinocytes (about 90% of epidermal

cells- produce the protein, Keratin), Melanocytes (about 5% of epidermal cells- synthesize melanin), Merkel's cells (less than 1% of epidermal cells- nerve endings), and Langerhans' cells (about 2-3% of epidermal cells- star shaped cells). The epidermis consists of cells that take part in defense against disease. The four layers which make up the epidermis are the stratum corneum, stratum lucidum, stratum granulosum, and stratum malpighi. The dermis consists of only two layers: the papillary layer and the reticular layer.

Conditions of the Skin

Comedones, also referred to as blackheads, are hardened plugs of oily material and dead cells retained in the pore. Similar to a whitehead, the main difference between the two is that the contents of blackheads are trapped higher in the pore, exposing the congested contents to the air, causing it to darken.

Milia, also referred to as whiteheads, are a retention type of cyst in which excretions of the follicle and sebaceous glands are trapped beneath the epidermis. Acne is a chronic inflammatory condition of the skin that may appear on the face, back, and chest. This is one of the most common conditions of the skin.

Seborrhea is an oily condition of the nose, forehead or scalp caused by over-active sebaceous glands.

Asteatosis is just the opposite: a dry, scaly condition of the skin caused by a deficiency of sebum.

Chloasma is an irregularity in pigment in various areas of the skin. It is frequently called the "mask of pregnancy," because it often follows a pregnancy. A keloid is an elevated fibrous hypertrophy developing at the site of the external trauma of the skin. As a reaction to injury, the keloid is a permanent lesion occurring only in those who have a congenital predisposition to this condition. African Americans are generally prone to keloids. A wart, or verruca, is a skin tumor due to multiplication of certain cells altered by the action of a virus. A mole is a small congenital macule ranging in color from brown to bluish black.

Any mole with the following symptoms should receive prompt medical attention: an increase in size, change of color, crust formation, bleeding, an inflamed ring of color around the mole, or increase in depth of pigment. Impetigo is a common skin infection (affecting mostly children), caused by Staphylococcus aureus, Streptococcus pyogenes. This can lead to the formation of scabby, yellow-crusted sores and/or small blisters filled with yellow fluid, which can last from days to weeks. Generally, impetigo causes clusters of sores to rupture and develop a honey-colored crust over the sores. Impetigo can occur anywhere on the body, but most commonly occurs on the arms, legs, and face. Impetigo often affects normal skin but may follow an injury or a condition that causes a break in the skin, such as a fungal infection, sunburn, or an insect bite. Poor hygiene and a moist environment are also risk factors. Some people have Staphylococcus bacteria living in their nose without causing disease. These nasal bacteria may cause repeat infection in the person and sometimes in others. Impetigo is itchy and can be painful. The itching often leads to extensive scratching, particularly in children, which serves to spread the infection and more severe pain. Impetigo is very contagious to other areas of the person's skin and to other people. Impetigo blisters

burst and expose larger bases, which become covered with honey-colored varnish or crust. Doctors base the diagnosis on the appearance of the rash. If people have repeated infections, a swab of the nose is taken and sent to the laboratory to determine if they are a nasal carrier of staphylococci. In order to treat impetigo, the infected area should be washed gently with soap and water several times a day to remove any crusts. Small areas should be treated with topical antibiotics. If large areas are involved, an antibiotic taken by mouth may be needed. People who are nasal carriers are treated with topical antibiotics applied to the nasal passages.

The Nails

The nail mostly consists of protein made from amino acids. However, the nail itself is made up of sulfur, carbon, hydrogen, oxygen, nitrogen, and iron. Sulfur gives the nail its strength. The cuticle is the skinfold over the nail bed. The lunula, thought to be immature keratin of the growing nail, is a white crescent shaped region at the base of the nail plate. The nails forms when Keratinocytes in the nail bed proliferate, grow, synthesize hard keratin, dye, and form the matrix of the nail.

There are several problems one might face with nail care, but the most common is a fungal infection. This occurs when fungi infect one or more of your nails. The early stages of fungal infections of the nail are white or yellow spot(s) under the tip of your fingernail or toenail. When the fungus begins to spread deeper into your nail, it may cause your nail to discolor, thicken and develop crumbling edges. This can cause severe discomfort and an unappealing cosmetic appearance. Fungal infections can be difficult to treat, and it is common to have repeated outbreaks in the same area. In order to treat nail fungus, your client may need an over-the-counter antifungal ointments or oral prescription from their doctor.

MMA – Methyl Methacrylate Liquid Monomers

For quite some time, MMA has been used as an ingredient in professional nail products. These are also referred to as “porcelain nails.” The FDA placed a ban on these products due to many complaints from patrons. However, there is a safe way to use Methyl Methacrylate: in the polymer powdered form. This form has been deemed safe to use on natural nails. Although it is illegal, some salons are still using MMA products because it is cheaper and more effective than others. However, there have been several complaints to the FDA regarding these products. Complaints have ranged anywhere from a simple skin allergy to complete loss of the nail. Moreover, long term exposure to the nail technician or client can result in permanent damage to the respiratory system and liver.