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L y m p h e d e m a I n f o r m a t i o n
S u p p o r t G r o u p

Healthy Tissues

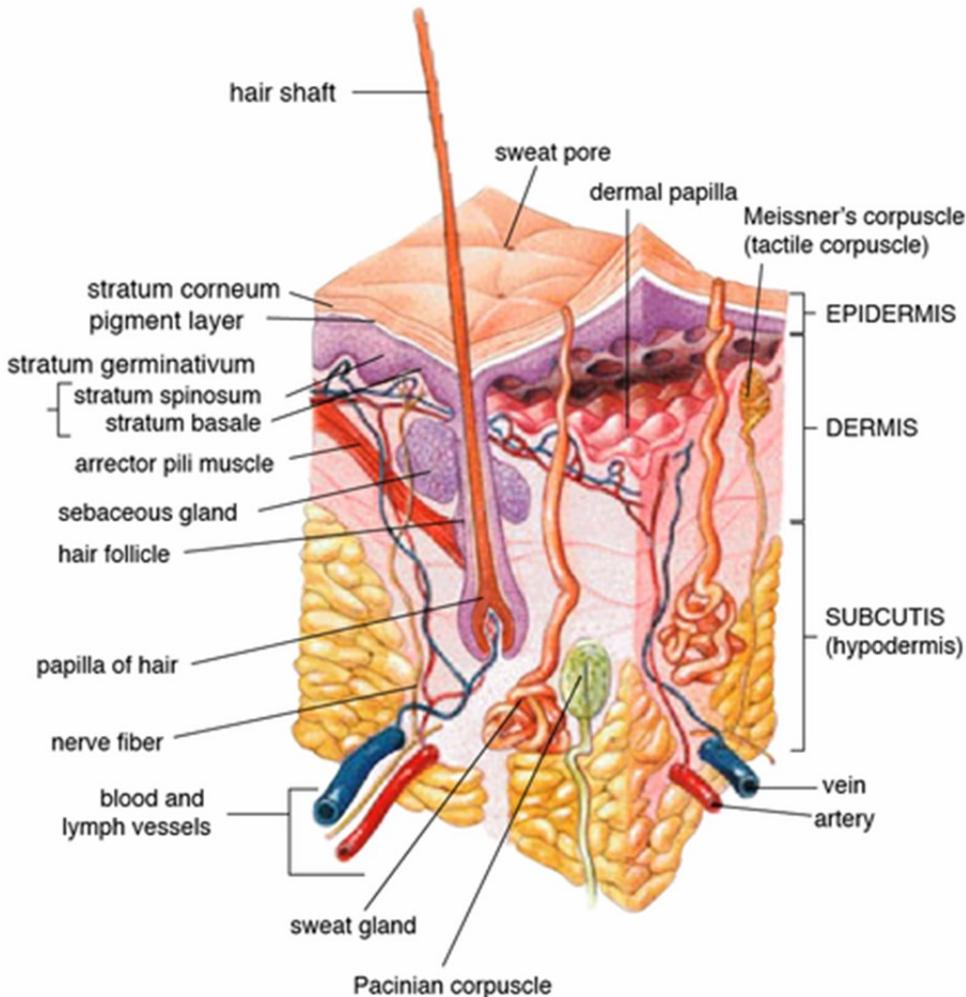
An Important “Ingredient” in the Treatment of
Lymphedema and Lipedema

Volume 7
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Anatomy of the Skin



*More Information
about Current
Lymphatic Research
can be found at:*

*Lymphatic Education
& Research Network
(LE&RN)*

*Stanford Lymphedema
Clinical Trials -
Leslie Roche—
650-723-1396*

Upcoming Event:

CMSA Resource Fair

Wed. Oct. 4, 2017

Hotel Valencia

Courtyard/Ballroom

5:30—8:30 p.m.

Anatomy & Physiology of the Skin

Healthy Tissues—2

The skin is an **Organ** in that it absorbs substances applied to its surface and excretes waste products from underlying tissues by means of the *pores*. It is the body's largest organ and comprises 15% of the total body weight. It receives one-third (1/3) of the body's circulating blood volume and therefore, anything you eat or drink will affect its health. The *pores* of the skin allow entry of applied solutions and exit of wastes that lie in the tissues under the skin's surface. Pores exist all over the body, more in exposed areas such as the face, neck and head, and fewer in areas of the body most often covered by clothing, where there are approximately 10-20 pores per square 1/2 inch. The skin *must breathe and be clear of debris and congestion*. Dry skin is dead skin debris and serves as “seran wrap” preventing the skin from absorbing topical products you've applied. Surface dry skin is also a source of congestion obstructing excretion of waste products through the pores. ***The health of your skin depends upon what you put into your body, the degree to which you keep it clear of debris and congestion, and how well you protect it from outside trauma.***

Healthy skin is slightly moist, soft, flexible, has a smooth and fine-grained texture, possesses a slightly acid reaction and is free from any disease or disorder. Its acidity provides an immune response to organisms that touch or try to enter it. The skin of a typical adult covers about 18.2 square feet and weighs about 6 pounds. It is thinnest on the eyelids and thickest on the palms of the hands and soles of the feet. It is the barrier that keeps the outside out and the inside in. The skin's unbelievable complexity is only partially indicated when we consider the fact that each square inch contains: 65 hairs, 950,199 sebaceous glands (oil), 78 yards of nerves, 19 yards of blood vessels, 650 sweat glands, 9,500,000 cells, 1,300 nerve endings to record pain, 19,500 sensory cells at the ends of nerve fibers, 78 sensory apparatuses for heat, 13 sensory apparatuses for cold and 160-165 pressure apparatuses for perception of touch.

As with anything, the best way to protect and keep you skin healthy is to find out more about it. Let's study the anatomy and physiology of the skin—how it's made and how it works—by looking at the skin's three (3) layers:

Epidermis: It is the outer layer, the “cuticle or scarf skin”. It consists of dead cells acting as a protective covering and contains no blood vessels but has many small nerve endings. Since epidermis cells are continually being replaced, it and its appendages, namely the hair and nails, will be greatly affected by chemotherapy. Epidermis cells are replaced by new cells germinating from underlying healthy tissues. If these underlying tissues contain body wastes or toxic substances that cannot, or are slow to be evacuated, the skin will not be healthy. *The average depth is 0.1 millimeter—about the thickness of one sheet of paper.*

Anatomy & Physiology of the Skin**Healthy Tissues—3**

Dermis: The “true skin” is a highly sensitive and vascular layer of connective tissue containing blood and lymph vessels, nerves, sweat and oil glands, fat cells and hair follicles. *Collegen*, a network of microscopic interwoven fibers, makes up about 70% of the dermis. It allows for stretching and contraction of the skin, provides strength, and aids in the healing of wounds. The protein between *collagen* fibers is called *elastin*. *Elastin* gives the skin its elasticity. As collagen weakens with age, the skin loses its tone and suppleness, causing lines and wrinkles. *Its average depth is 2mm.*

Subcutaneous: It is the fatty layer that gives smoothness and contour to the body. It stores fat for use as energy; acts as a protective cushion for the skin and is maintained by a network of arteries, veins and lymphatics. It is called the “ground substance” because this area supplies nourishment for the skin and underlying tissues. Whatever you eat, drink or ingest, good or bad, will find its way to the subcutaneous layer. Therefore, whenever we treat lymphedema or lipedema, this area concerns us most because body wastes are not being properly eliminated. *It’s depth ranges from 1.95mm on the face to 15.73mm on the triceps.*

Ways topical applications penetrate the skin:

- Hair follicle (opening where hair penetrates skin)
- Sebaceous gland (oil)
- Sudoriferous gland (sweat)
- Entire skin’s surface

Factors that Prevent Penetration of Topical Applications and Excretion of Body Wastes:

- Buildup of dead cells—dry skin acts as a barrier
- Excessive surface oil or dirt—skin debris prevent entrance or exit
- Temperature of the skin—warm skin is more penetrable
- Fibrosis—skin and underlying tissues are hard and far less flexible and accepting
- Clogged pores and hair follicles—nothing penetrates or exits a clogged opening.

Anatomy & Physiology of the Skin**Healthy Tissues—4**

The surface of the skin is only as healthy as the underlying tissues. Anything we put into our body, good or bad, will find its way to these underlying tissues. And since the skin's healthy cells germinate from underlying tissues, if these underlying tissues are filled with toxic or unhealthy substances, the skin is predisposed to: wounds, infection, cellulitis, reduced immunity to bacteria, dryness, cracking producing leaking of body tissues (lymph), and many other side effects.

We don't take care of our largest organ as we should. Given all the problems that can occur if we don't, isn't it about time we start?

The Daily Skin Care Regimen That Will Produce Healthy Skin:

Using a mild soap, lightly cleanse the skin with a nylon puff—removing any surface debris

Rinse the skin well with clear water

Towel dry excess water but leave skin slightly moist.

Apply a water base lotion all over the body and gently massage into the skin.

Remember the epithelium sloughs old skin cells constantly, so you'll notice a difference in the texture, color and integrity of the skin within a few days.

Keep up the Good Work!

Anatomy & Physiology of the Skin**Healthy Tissues—5****Daily Skin Care For Very Dry Skin**

AM – Soak affected area in warm lightly soapy water – 15 minutes (use liquid soap)

While soaking dry feet and/or hands, wiggle fingers/toes in water and lightly run soft wash cloth or nylon puff over dry areas.

Don't attempt to remove all the dry, encrusted skin in one session.

Rinse well and pat excess water with soft towel

While skin is still moist, apply water-base lotion – eg, *Eucerin Light* - to area especially between toes and fingers making sure all lotion is absorbed.

If you wear gradient compression stockings daily,

Apply *Alps Lotion* over your water base lotion. *Alps Lotion* will aid in sliding up stockings and further protect the skin.

Apply gradient compression garment or other forms of compression.

PM – repeat AM directions – leaving off Alps Lotion and stockings

If feet or hands are very dry, apply emollient *A/D ointment* to feet or hands

Thoroughly, wrap feet/ hands in Seran wrap or plastic bag and cover with soft cotton gloves or socks.

Sleep in this over night.

After following this regimen for one week, you'll have much softer, healthier skin.

Phyllis Tubbs-Gingerich, RN,BSN,LE,CLT – Lymphedema Specialist © 2017

Lipedema

Lipedema—Painful Fat Syndrome—is a chronic disease of the fat cells. It affects 11% of women and it appears as an irregular distribution of fat beneath the skin. It is characterized by bilateral, symmetrical fatty tissue excess, mainly in the hip region, upper and lower leg areas. This is combined with a tendency for leg swelling that worsens with standing. It usually begins as a cosmetic concern but eventually causes pain and other severe problems. The condition is extremely rare in males.

Cause: Unknown

Female hormones are suspect because the condition affects mostly women. In addition, lipedema often begins or worsens at puberty, during pregnancy, following gynecologic surgery and around the time of menopause.

Genetic: Many women have, or have had, family members with the condition.

Other possible causes: metabolic, inflammatory

Symptoms: *Lipedema can be mistaken for simple obesity:*

- Large lower half and column-like legs—the top of the body may be a size 8 but the bottom half may be a size 16.
- Tissue hypersensitivity
- Fat lobes may put stress on joints causing abnormal gait and/or increased joint pain.
- Knee problems may lead to gait impairment
- Accumulation of lipedema fat in upper arms
- Bruising easily
- Decreased skin temperature in limbs
- General fatigue
- Sensitivity to pressure
- Age of onset is usually puberty, pregnancy or menopause
- Chronic pain



Lipedema

Part II

Diagnosis: Best way—a manual inspection performed by a trained physician. Upon palpation of the fat the healthcare professional may feel tiny pebbles or pea-like nodules. As the disease advances the nodules may increase in size and in number and may form strands or nodules.

Progression of disease: fat cells continue to build up and the lower body enlarges. Over time, enlarged fat cells block the lymphatic vessels preventing proper drainage of lymph fluid resulting in retention of body wastes in the tissues and severe swelling. Lymphedema develops as a result.

Treatment:

1. ***Diet and exercise*** will not reduce the size of the fat cells involved in lipedema. However, it is very important to continue to follow a healthy regimen to eliminate non-lipedema fat cells and reduce inflammation.
2. ***Complete Decongestive Therapy (CDT)***: gradient compression garments, circumferential measurements of affected body part, intense skin care, a nutritional and fluid intake regimen, specific exercises with compression, water therapy, supportive shoes, manual lymph drainage, gradient sequential pneumatic pumping device, gradient bandaging, directional flow garment, keeping active and a positive enhancing life support:

Manual Lymph Drainage (MLD): stimulates the flow of lymph out of blocked areas into healthy vessels where it can drain into the venous system. This helps relieve pain, reduces swelling, eliminates body wastes and prevents fibrosis.

Compression: Use of stretch bandages, custom fitted panty hose, panties or spandex shorts will increase tissue pressure in the swollen areas and lessen fluid build-up. Patient, family, care givers and medical professional must be alert for patient's degree of tolerance for compression.

Exercise: Helps to reduce fluid build up and increases mobility of the legs.

Meticulous skin and nail care: lowers the risk of wounds and infection.

Lipedema

Part III

3. **Surgery**—Lymph-Sparing Liposuction (water-assisted and tumescent liposuction) can remove lipedema fat. The procedure uses a hollow tube that is placed under the skin to suction fat tissues. Several sessions may be needed depending on the amount of abnormal fat.

Complications and/or co-morbidities: articular and venous diseases, lymphedema, obesity, psycho-social disorders, severe pain and tissue sensitivity, anxiety and depression reduced joint mobility, greatly impaired gait.

Education and support: Social support groups are available on the internet and attend groups.

Books & periodicals:

Marie Todd, “Chronic Oedema”, 2010; 10-16

Allen EV Hines EA, “Lipoedema of the Legs”, Mayo Clinic, 1940; 15:184

Meier-Vollrath Schmeller, I, “Lipedema”, Chapter 7

S.G. Chen, S.D. Hsu, T.M. Chen, H.J. Wang, “Painful Fat Syndrome in a male Patient”, 2004

Karen L. Herbst, PhD., MD, “Lipedema”, 2016