



Beautiful By Design: Inside the Wondrous World of Skin

*What it is, what it does, what goes wrong—and how to love the skin
you're in*

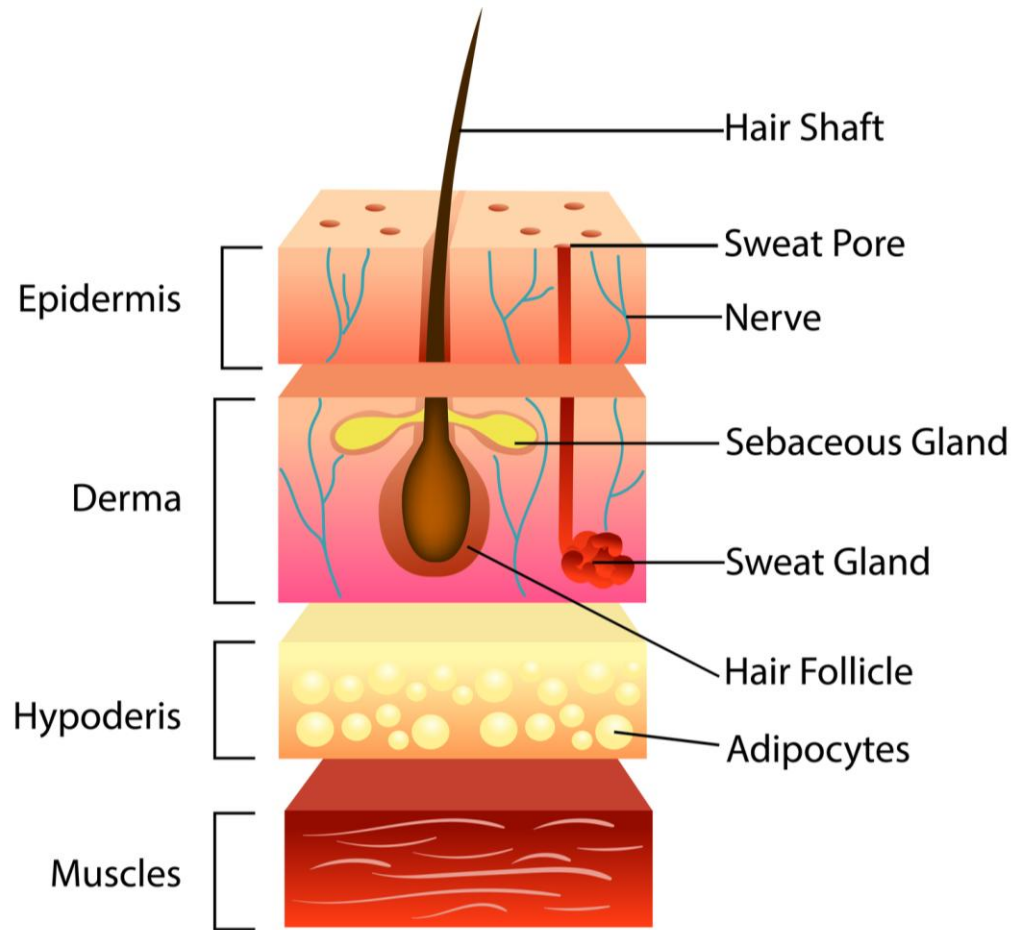
The Skin You're In

Fun fact: Skin is the **largest organ of the human body**, averaging **16% of body weight** and covering **~22 square feet!**

It's not just a covering—it's protection, sensation, detoxification, immune defense, and even hormone production!



Human Skin Structure



👉 Skin Structure: “Beneath the Surface”

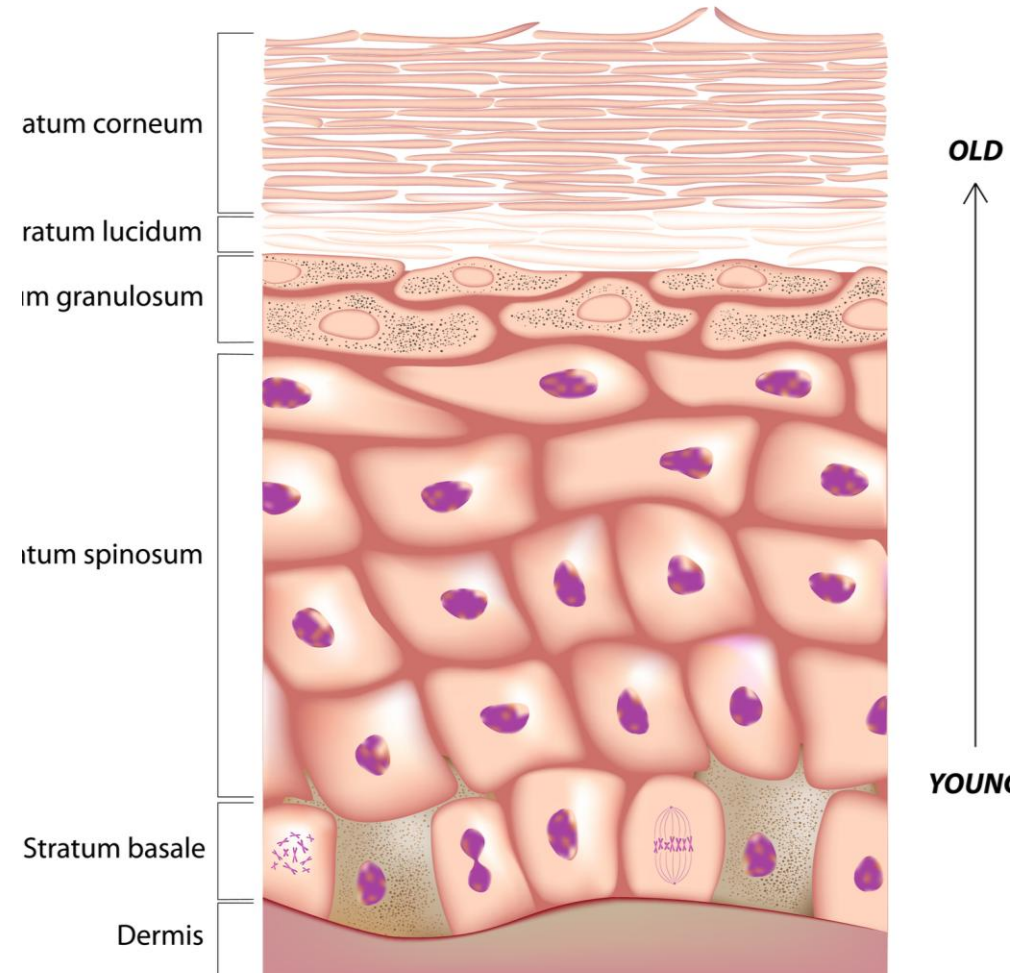
- **Epidermis** – protective outer barrier; keratinocytes, melanocytes, Langerhans cells
- **Dermis** – connective tissue, collagen/elastin, blood vessels, nerves, sweat and oil glands, hair follicles
- **Hypodermis (subcutaneous layer)** – fat layer for insulation and shock absorption
- Skin appendages: hair, nails, sebaceous and sweat glands
- Every square inch of skin contains ~20 feet of blood vessels and over 1,000 nerve endings!

Epidermis: Layers & Cell Cast

Layers (deep → superficial)

- **Stratum basale:** stem cells; keratin 5/14; melanocytes; Merkel cells (touch)
- **Stratum spinosum:** “spiny” desmosomes; keratin 1/10; Langerhans (immune sentinels)
- **Stratum granulosum:** keratohyalin (profilaggrin→filaggrin); lamellar bodies (lipid packets)
- **Stratum lucidum:** only in thick skin (palms/soles)
- **Stratum corneum:** flattened, anucleate **corneocytes** in a lipid matrix

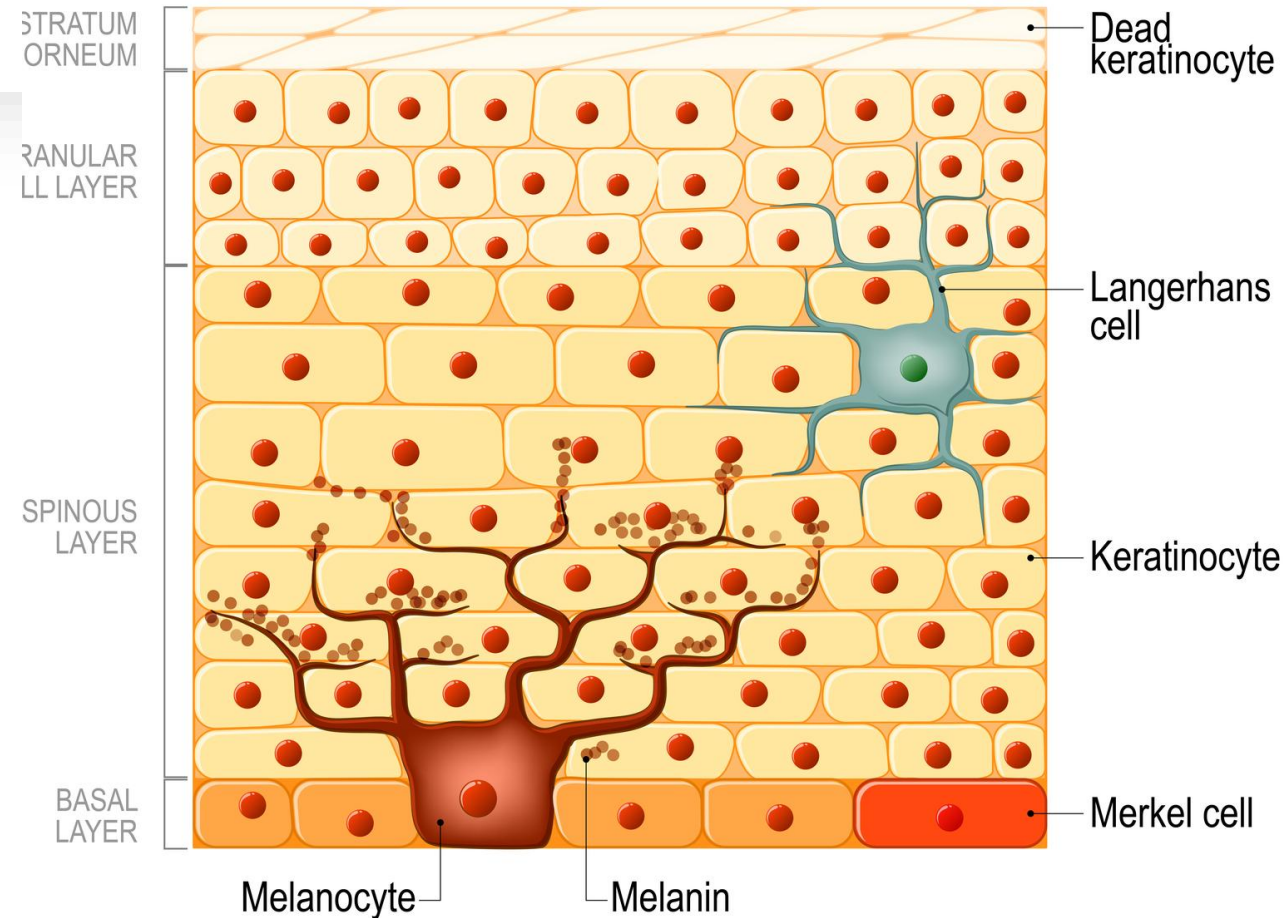
Structure of the Epidermis



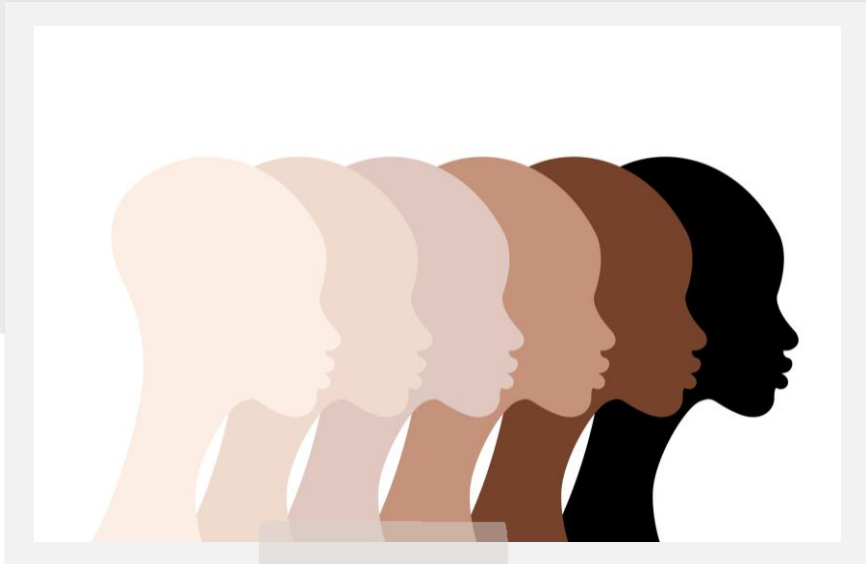
Key players

- **Keratinocytes** (~90%): barrier builders; 28–40-day turnover (faster in youth; slower with age)
- **Melanocytes**: dendritic cells that hand melanin to keratinocytes (photoprotection)
- **Langerhans cells**: antigen-presenting; link skin to immune system
- **Merkel cells**: mechanoreceptors (fine touch)

EPIDERMIS



🤝 THE COLORS OF US: What Determines Skin Pigmentation



Melanin: the pigment responsible for skin color, produced by **melanocytes** in the basal layer of the epidermis.

- Two main types:
 - **Eumelanin** (brown–black tones)
 - **Pheomelanin** (red–yellow tones)
- Everyone has roughly the same number of melanocytes — what differs is:
 - Amount of melanin produced
 - Ratio of eumelanin to pheomelanin
 - Size, shape, and distribution of **melanosomes**

Environmental adaptation:

- Darker skin = protection from intense equatorial UV radiation
- Lighter skin = enhanced **vitamin D synthesis** in northern latitudes

Other contributors: carotenoids (dietary pigments) and hemoglobin (circulatory tone)

FUNCTIONS OF THE SKIN:

“The Many Hats of Your Skin”

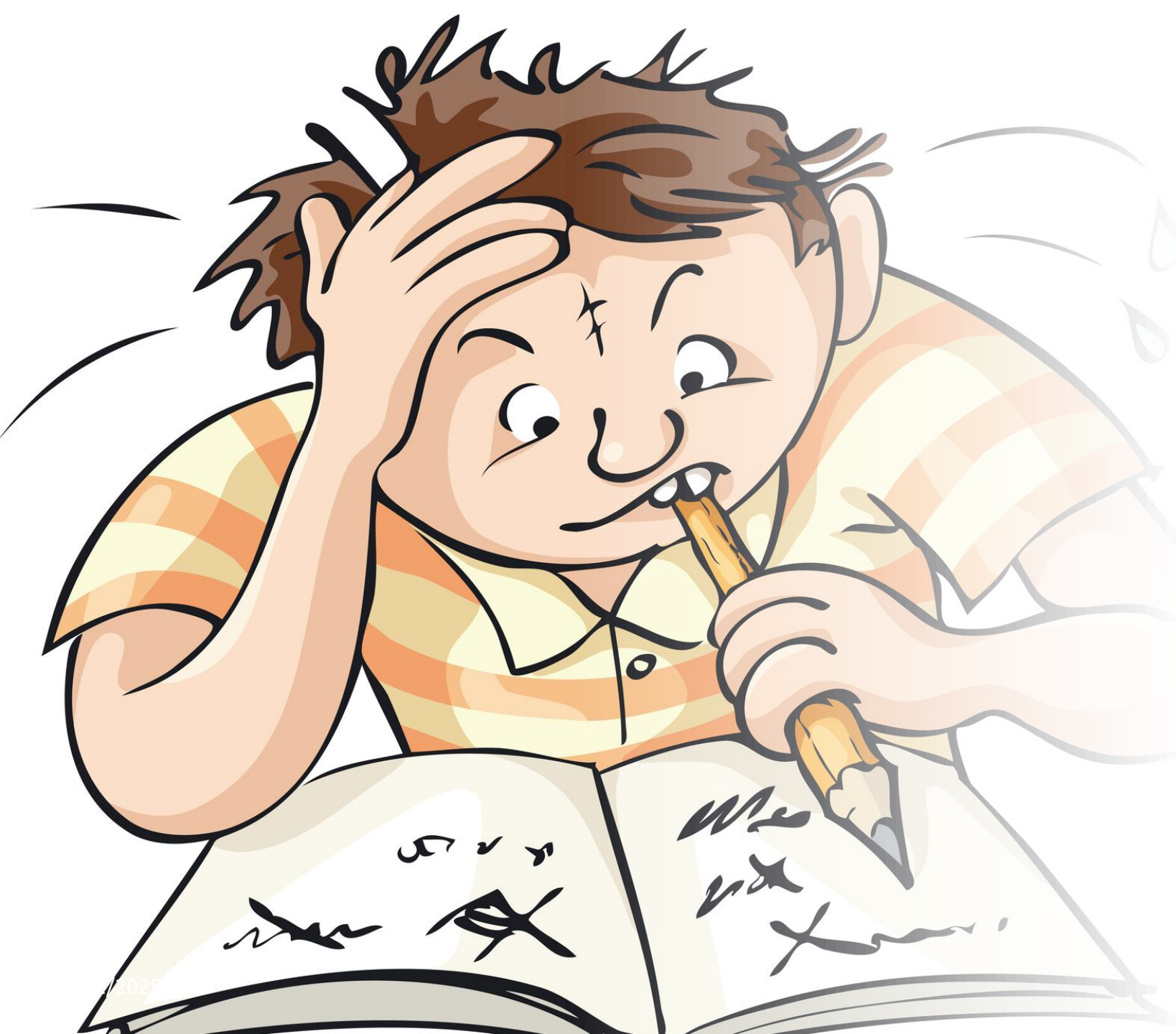
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- **Barrier & protection** – against microbes, UV radiation, mechanical injury
 - **Thermoregulation** – sweat, vasodilation, and goosebumps!
 - **Detoxification** – elimination of waste via sweat
 - **Immune defense** – microbiome and immune cells in the epidermis
 - **Sensation** – touch, pressure, heat, cold, pain
 - **Hormone synthesis** – vitamin D production from sunlight



🤦‍♀️ DETOXIFICATION & SWEATING

- The skin as a **backup detox organ** when liver, kidneys, or lymph are overloaded
- Sweat gland types:
 - **Eccrine** – watery sweat for cooling
 - **Apocrine** – scent glands in axilla/groin, activated by stress and hormones
- Sweating helps release **urea, ammonia, and trace metals**
- Emphasize hydration and minerals (magnesium, potassium, sodium) for healthy perspiration





Eccrine vs. Apocrine:

Two Kinds of Sweat, Two Kinds of Stories




Eccrine Glands – Cooling & Cleansing

- **Most abundant** type — 2–4 million glands distributed across nearly all skin surfaces.
- Highest density on **palms, soles, forehead, and upper back**.
- Open **directly onto the skin surface**.
- Secrete a **clear, watery solution** of water, electrolytes (sodium, potassium, chloride), small amounts of urea and lactic acid.
- **Activated primarily by heat and physical activity** for thermoregulation.
- Function: **cool the body** and support **detoxification** by flushing out water-soluble wastes.
- **Odorless** on its own — the “clean” sweat.

Apocrine Glands – Scent & Stress

- Found mainly in **hairy areas** — armpits, groin, around nipples, and scalp.
- Open into **hair follicles**, not directly onto the skin surface.
- Become active at **puberty** under hormonal influence.
- Secrete a **thicker, milky fluid** rich in proteins, lipids, and pheromone-like compounds.
- **Stimulated by stress, fear, or emotional arousal** more than temperature.
- **Bacteria on the skin break down apocrine secretions**, producing characteristic body odor.
- Function: *basic form of chemical signaling* — part of our “scent communication” system.



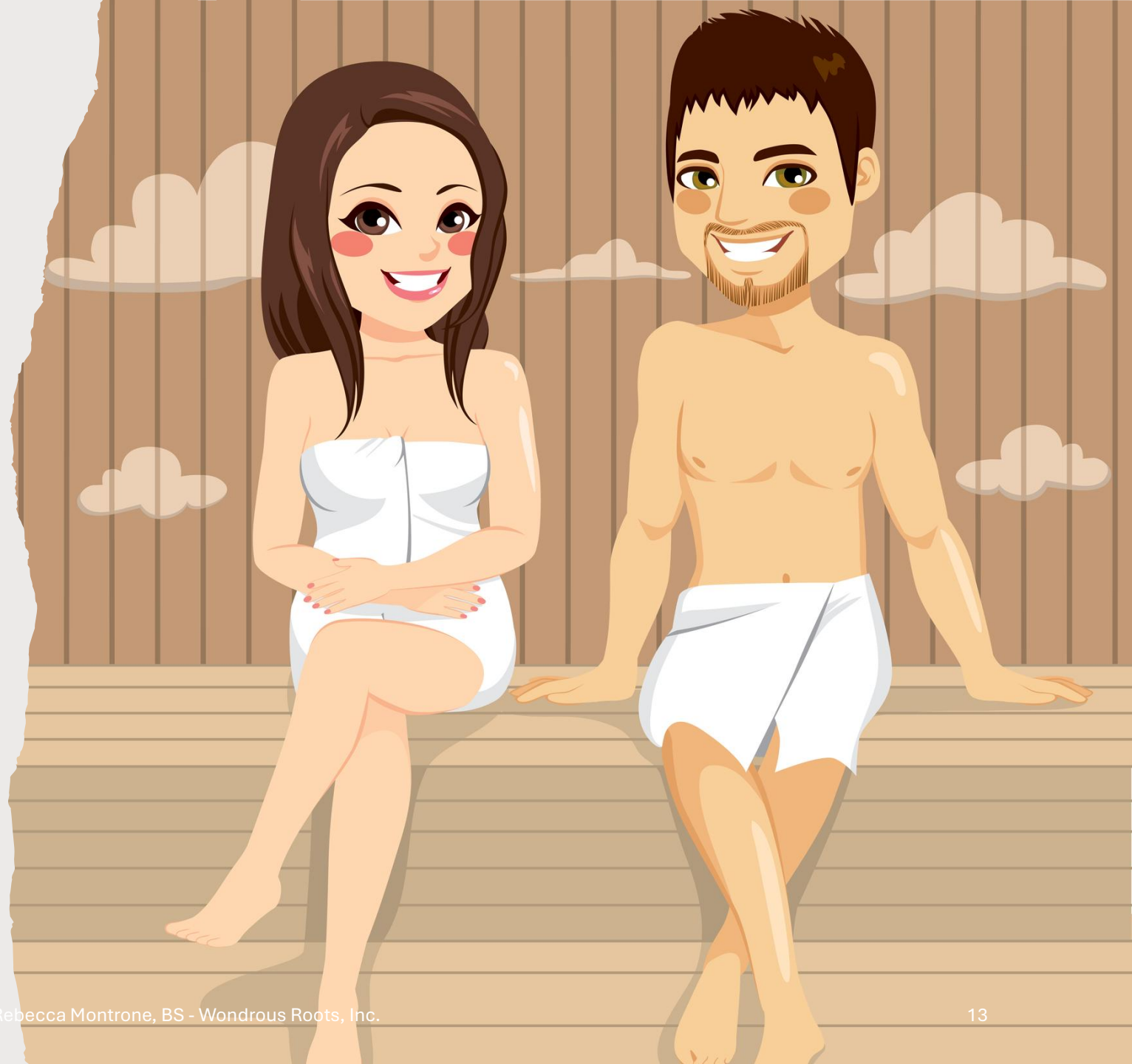
A photograph of a wooden sauna interior. The walls and benches are made of light-colored wood. In the foreground, a copper bucket sits on a wooden bench. In the background, a dark towel is folded on a higher bench. The lighting is warm and ambient.

How a Sauna Supports Detoxification:

the skin's natural sweating mechanism & how we can intentionally enhance it

The Science of the Sweat

- The skin is your **largest detox organ** — a “third kidney.”
- **Sweat glands** eliminate water-soluble toxins such as **urea, ammonia, and trace metals** (arsenic, cadmium, lead, mercury).
- Saunas amplify this process by increasing **core temperature, circulation,** and **lymphatic flow**, allowing deeper mobilization of stored toxins.



Types of Saunas

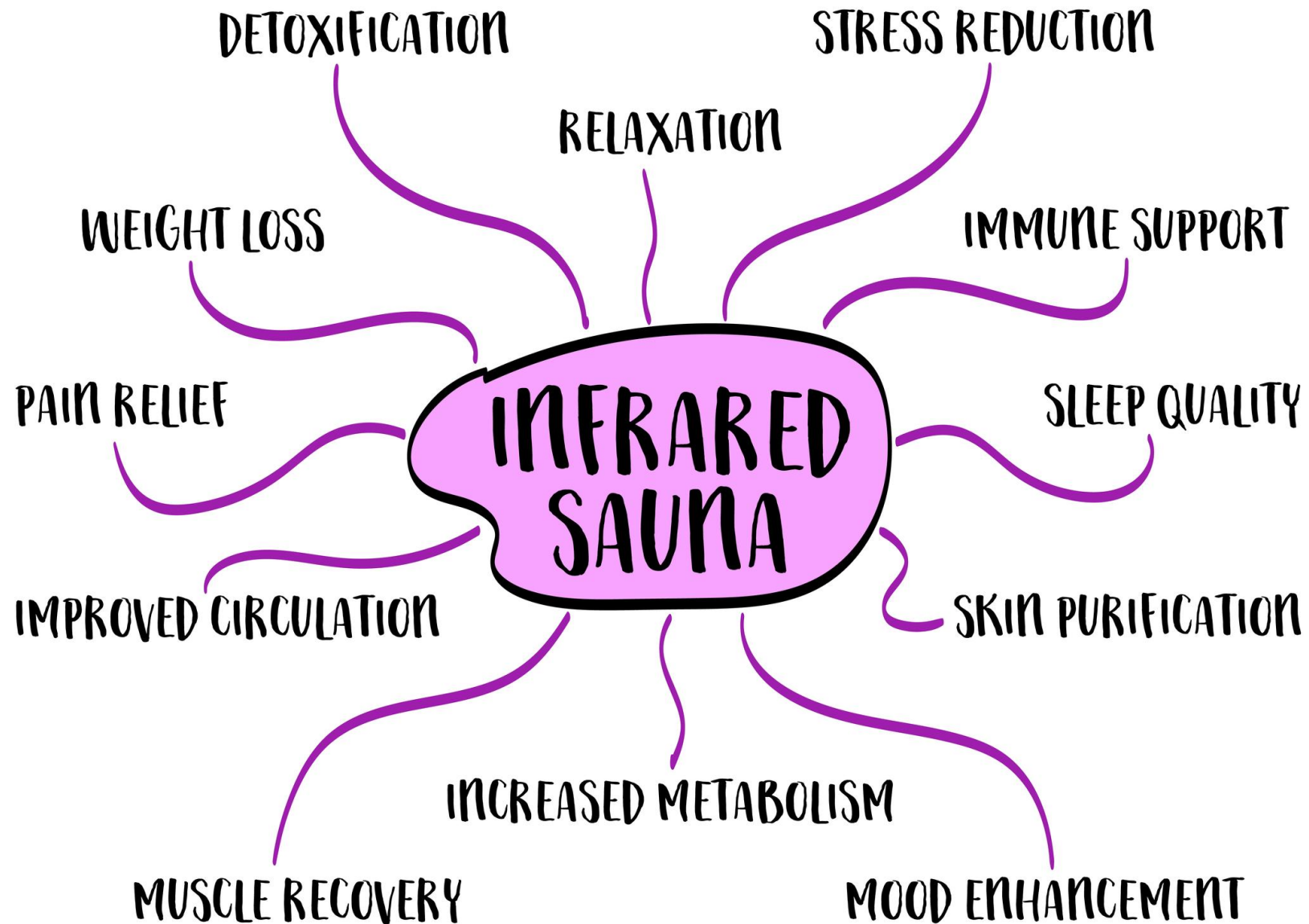
- **Traditional (Finnish):** Uses heated rocks and water vapor; warms air to 160–200°F → induces heavy sweating and vascular dilation.
- **Infrared Saunas:** Emit infrared light that penetrates skin and subcutaneous tissue, directly warming the body at lower ambient temperatures (110–140°F).
 - Encourages a **more gradual and prolonged sweat** with less cardiovascular strain.
 - May promote deeper tissue detoxification and mitochondrial activation.





Physiological Benefits

- **Enhanced circulation:** blood flow increases up to 2–3x resting rate.
- **Increased oxygenation:** helps nourish skin and tissues.
- **Induced heat-shock proteins:** aid in cellular repair and resilience.
- **Calming the parasympathetic effect:** encourages relaxation and toxin release.





Best Practices for Sauna Detox

- **Hydrate well before and after** — add electrolytes and trace minerals.
- **Dry brush or gentle exfoliate** before to stimulate lymph and open pores.
- **Start slow:** 10–15 minutes, work up gradually.
- **Cool rinse** afterward to close pores and refresh circulation.
- **Frequency:** 2–4 sessions per week is ideal for most people.



THE IMMUNE CONNECTION:

When the Inside Shows on the Outside

The Gut-Skin Axis

The **gut-skin axis** describes the constant, two-way communication between the digestive system and the skin through immune, hormonal, and metabolic pathways. When the gut microbiome is healthy and intestinal permeability is low, inflammatory signals stay quiet and nutrients essential for collagen formation and barrier repair are well absorbed. But when dysbiosis, leaky gut, or sluggish elimination occur, toxins and inflammatory molecules can spill into circulation, often manifesting as **acne, eczema, rosacea, or dull, reactive skin**. Supporting gut integrity with probiotics, fiber, polyphenol-rich foods, and proper digestion therefore helps calm inflammation and restore the skin's natural clarity and resilience—from the inside out.



DIGESTION



IMMUNITY



SLEEP

**GUT
HEALTH**



SKIN HEALTH



MENTAL HEALTH

Eczema – (Atopic Dermatitis)

Eczema reflects a weakened skin barrier combined with an overactive immune response. When the “brick-and-mortar” structure of the epidermis loses ceramides and moisture, irritants and allergens penetrate easily, triggering inflammation and intense itching. Genetic factors, food sensitivities, and gut imbalance often contribute. Restoring barrier lipids, calming inflammation, and supporting the microbiome—inside and out—are key to long-term relief.



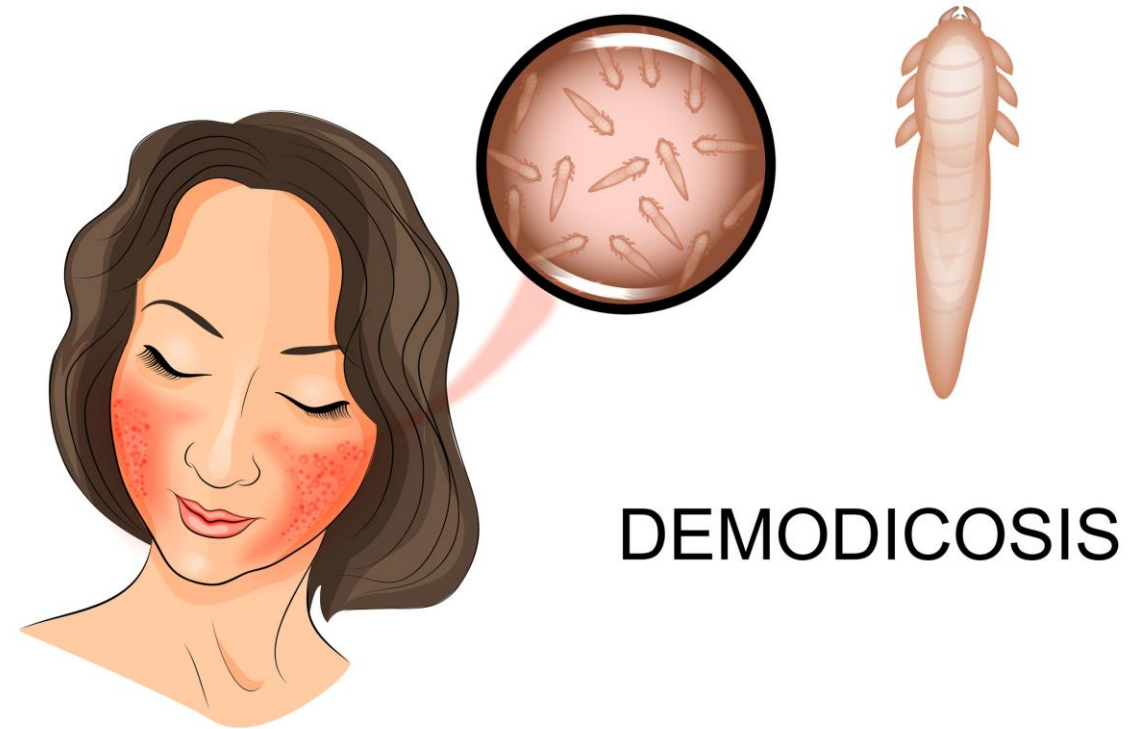


Psoriasis

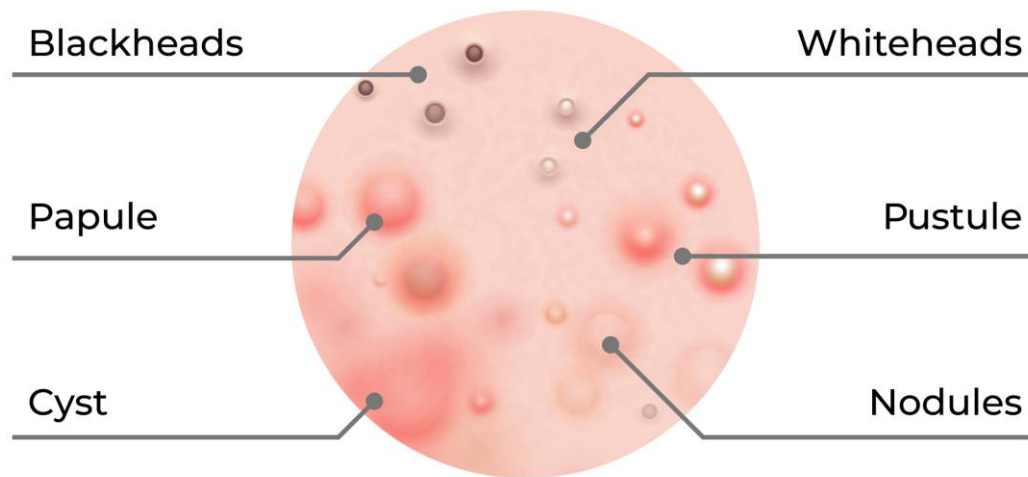
Psoriasis is an autoimmune-driven overproduction of skin cells, causing thick, scaly plaques with redness and itching. Instead of renewing every month, skin cells turn over in just days, piling up at the surface. This process is fueled by inflammatory immune signaling—especially from Th17 and cytokines like TNF- α . Addressing systemic inflammation, stress, and gut integrity helps slow the cycle and soothe the skin.

Rosacea

Rosacea involves chronic inflammation and vascular reactivity, leading to facial flushing, visible capillaries, and sometimes acne-like bumps. Triggers such as heat, alcohol, spicy foods, or stress can dilate fragile blood vessels. It's linked with microbial imbalance—particularly overgrowth of *Demodex* mites—and often reflects a sensitive gut-immune connection. Calming inflammation and supporting the skin's microbiome can restore tone and resilience.



Skin Acne Problems

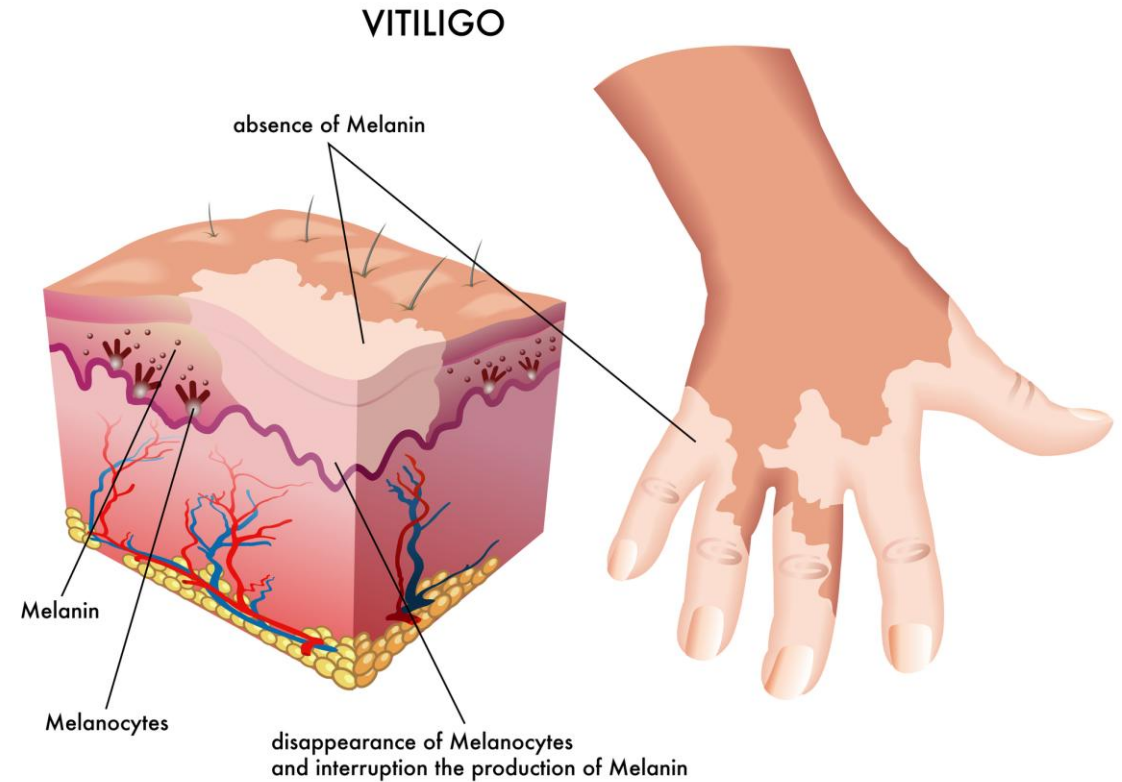


Acne

Acne results from overactive oil glands, clogged pores, and bacterial overgrowth (*Cutibacterium acnes*), amplified by hormones and inflammation. Androgens increase sebum production, while sluggish detoxification or gut imbalance can worsen breakouts. Balancing hormones, improving liver and gut function, and using nutrients like zinc, vitamin A, and omega-3s help clear skin naturally and prevent scarring.

Vitiligo

Vitiligo is an autoimmune condition in which the body's immune system mistakenly attacks and destroys **melanocytes**, the pigment-producing cells in the skin. As a result, smooth white patches appear where melanin is lost, often spreading gradually. Oxidative stress and genetic susceptibility play important roles, and emotional stress can sometimes trigger or worsen outbreaks. While repigmentation can be difficult, supporting immune balance, reducing oxidative damage, and protecting depigmented areas from sunburn are key to maintaining skin health and stability.

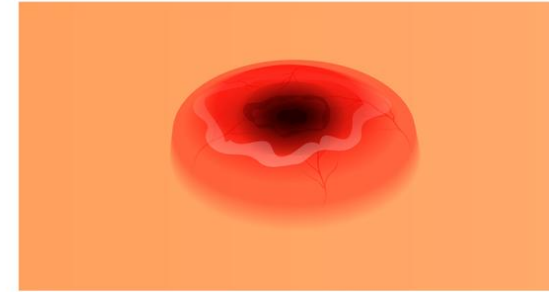


Common Types of Skin Cancer

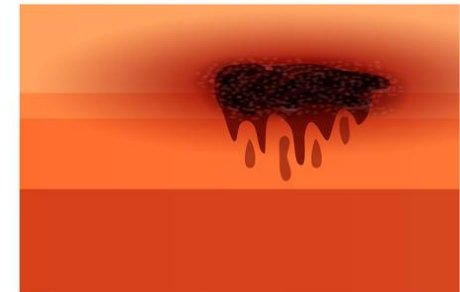
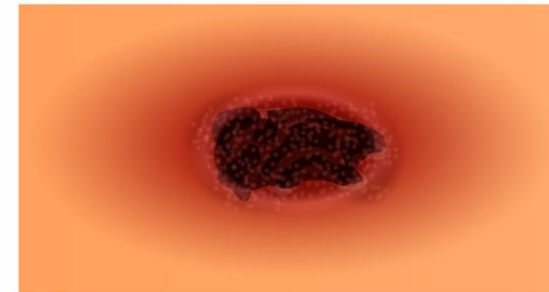
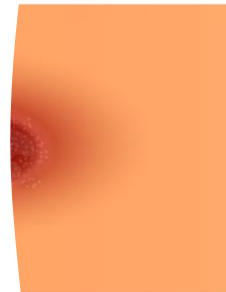
Just a brief overview

CANCER OF THE SKIN

Basal cell CARCINOMA



SQUAMOUS CELL CARCINOMA OF THE SKIN



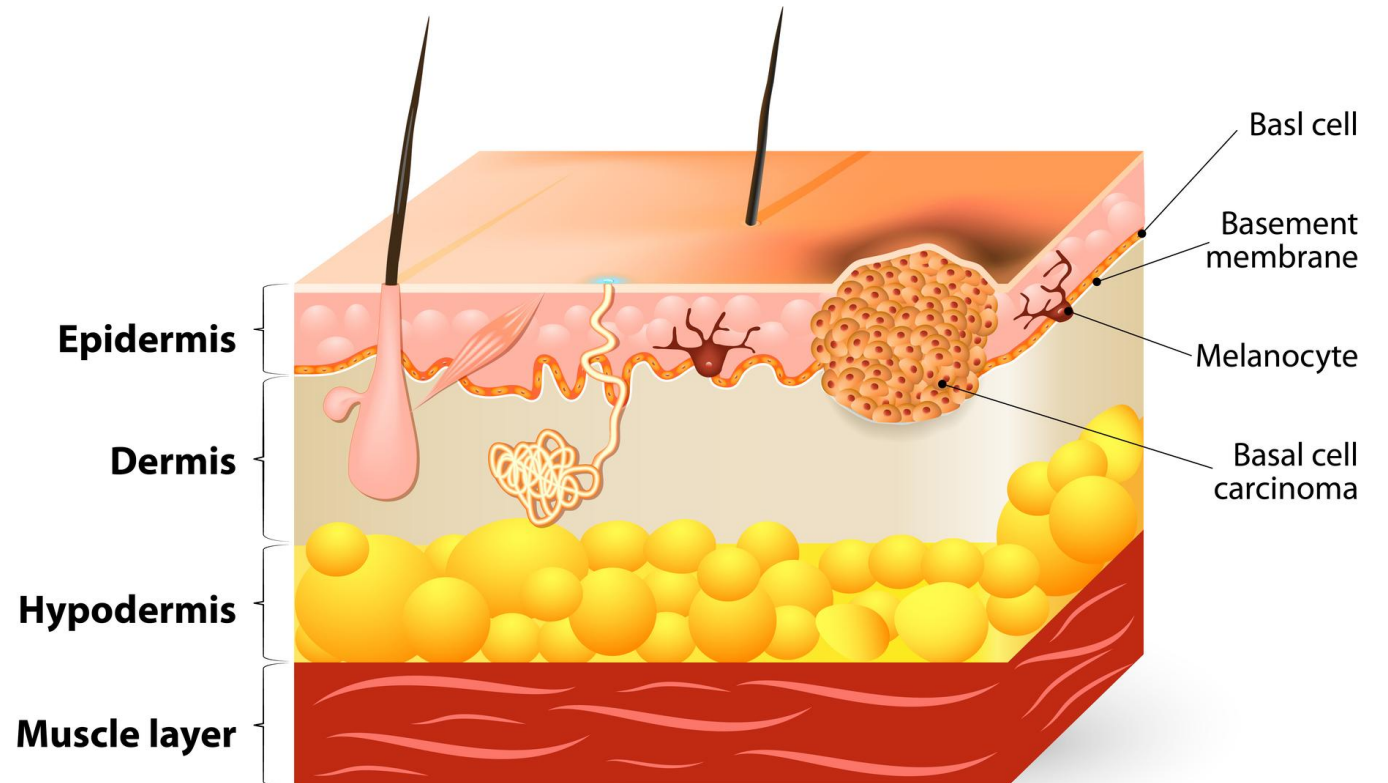
MELANOMA



Basal Cell Carcinoma (BCC)

- Most common, least aggressive.
- Originates in basal cells of the epidermis.
- Appears as a pearly bump, sore that won't heal, or small scar-like patch.
- Rarely metastasizes but can damage surrounding tissue if untreated.

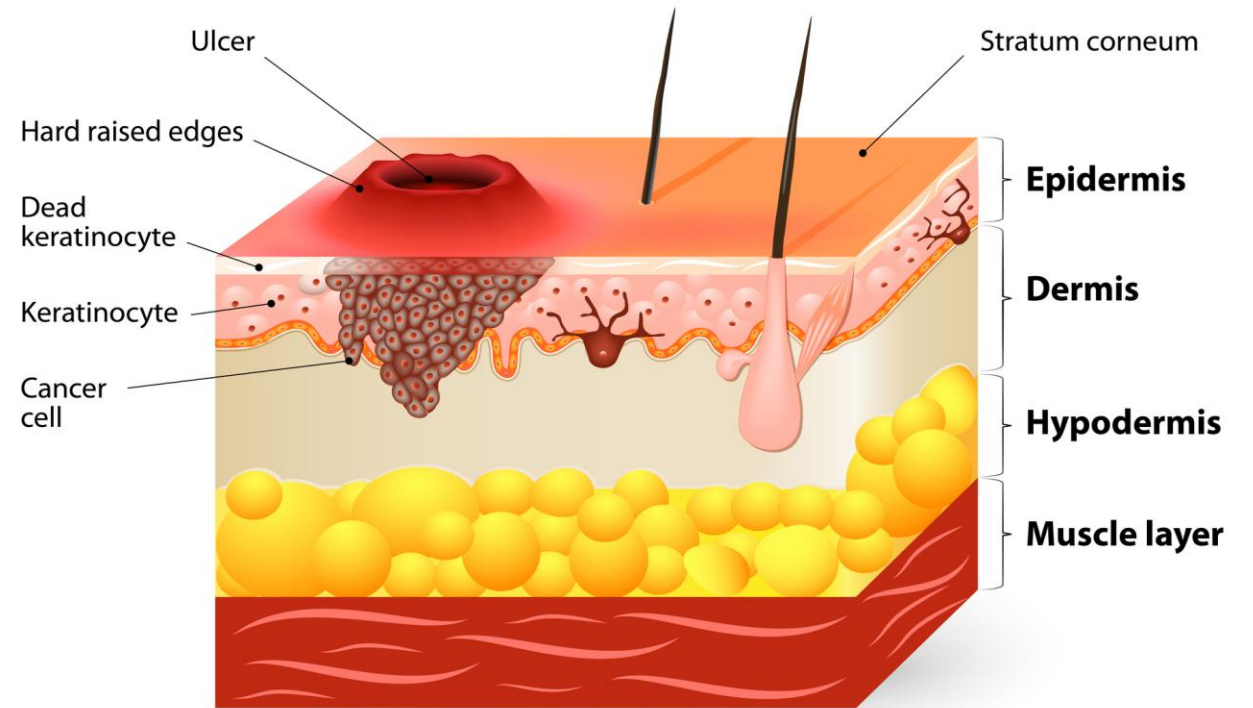
BASAL-CELL CARCINOMA



Squamous Cell Carcinoma (SCC)

- Arises from keratinocytes in the epidermis.
- Often develops on sun-exposed areas as a rough, scaly patch or raised bump.
- Can invade deeper layers and occasionally spread.
- Strongly linked to cumulative UV exposure.

Squamous-cell carcinoma



☀️ Actinic Keratoses (AK)

- Rough, scaly precancerous patches caused by chronic sun exposure.
- Common on face, scalp, ears, and hands.
- Represent early damage that can progress to **squamous cell carcinoma** if untreated.
- Prevention: sun protection, antioxidants, and early dermatologic care.



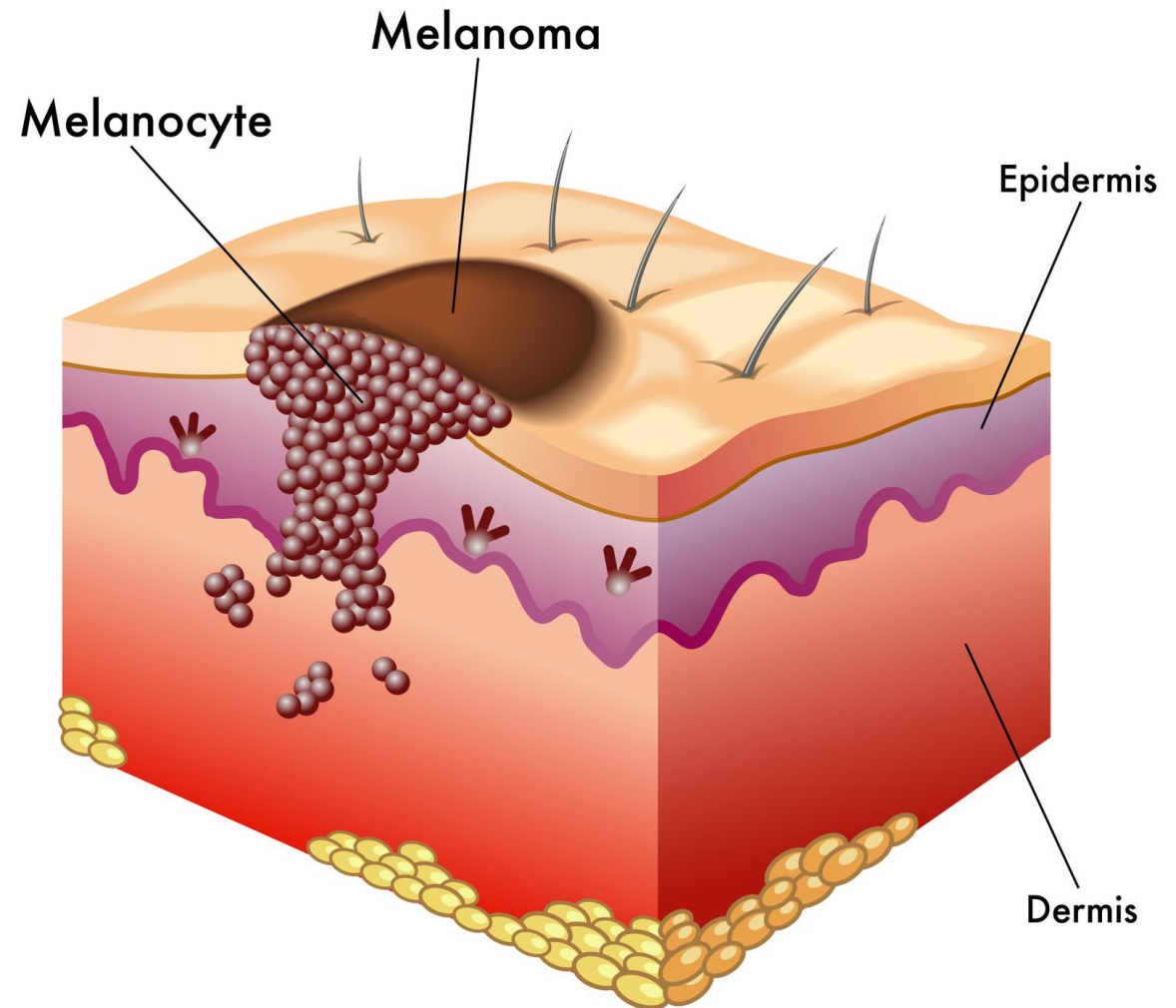
Eggplant Extract (Solasodine Glycosides / BEC / Curaderm)

Extracts from **eggplant (*Solanum melongena*)** contain compounds known as **solasodine rhamnosyl glycosides (BEC)**, which have shown selective cytotoxicity toward abnormal skin cells. These glycoalkaloids bind to receptors found predominantly on cancerous or precancerous keratinocytes, leading to their destruction while sparing healthy tissue. Topical preparations such as **Curaderm** have been used with reported success in treating **basal cell carcinoma, squamous cell carcinoma in situ, and actinic keratoses**, producing localized cell death followed by normal skin regeneration. While clinical data remain limited, the research and case outcomes are promising, highlighting eggplant extract as a gentle, plant-derived approach to supporting skin healing in these conditions.



Melanoma

- Develops from **melanocytes** (pigment cells).
- Less common but most dangerous due to rapid spread potential.
- Usually begins as a changing mole—**asymmetry, irregular border, multiple colors, diameter >6 mm, evolving appearance (A-B-C-D-E rule)**.
- Early detection is critical for survival.

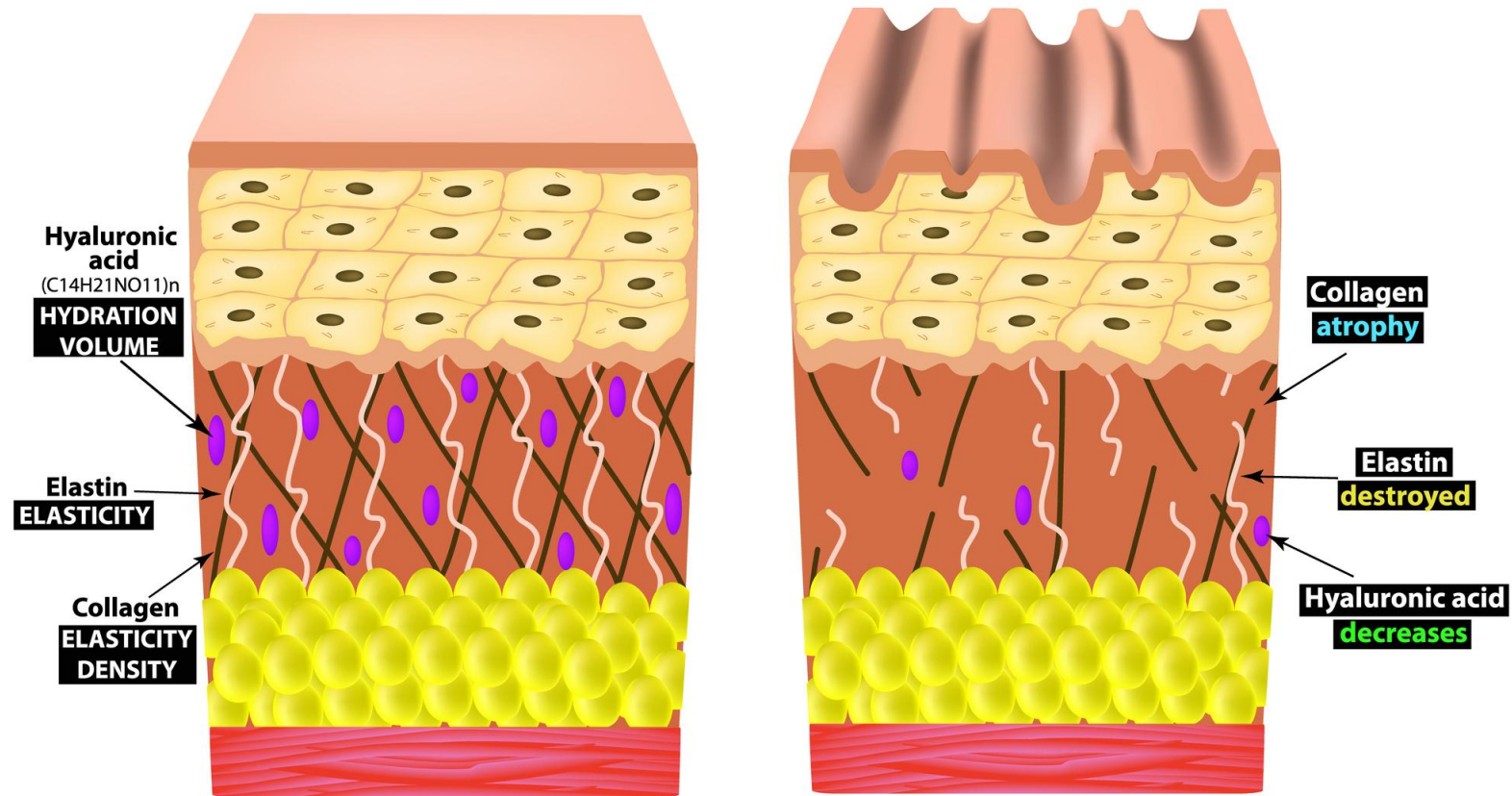


The background of the slide features three overlapping, semi-transparent faces of a woman, illustrating the progression of aging. The leftmost face is the youngest, with smooth skin and vibrant green eyes. The middle face shows slight signs of aging, such as fine lines around the eyes. The rightmost face is the oldest, with more pronounced wrinkles, especially around the eyes and mouth, and a more weathered complexion. The faces are layered, with the oldest face in the foreground and the youngest in the background.

SKIN & AGING:

What Time (and Lifestyle) Take Away

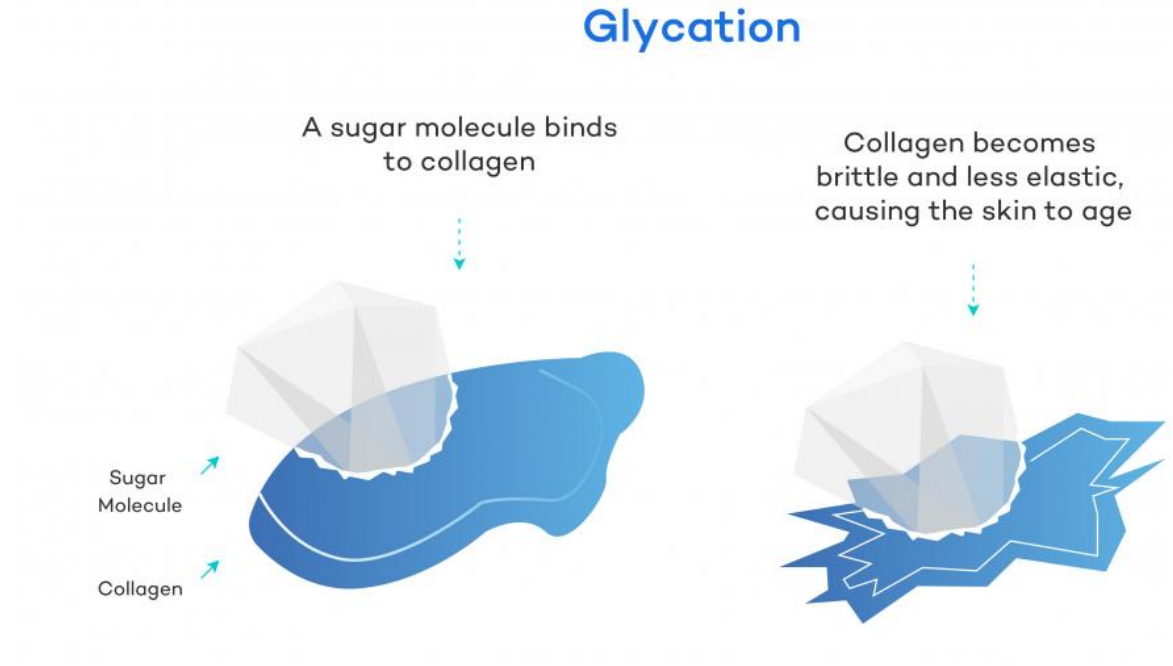
WRINKLE FORMATION



What contributes to the aging of our skin?

- Decline in **collagen and elastin** → wrinkles, sagging
- **Glycation** – sugar binding to collagen = stiffness and loss of elasticity
- **Oxidative stress** – UV light, pollution, smoking
- **Inflammation** – chronic, low-grade

You can see mitochondrial decline on the surface—energy, turnover, glow.





Sugar and Skin Aging (Glycation)

Excess sugar in the diet accelerates skin aging through a process called **glycation**, in which glucose molecules bind to proteins like **collagen and elastin**. These cross-links form **advanced glycation end-products (AGEs)** that stiffen and weaken the skin's structural fibers, leading to wrinkles, sagging, and loss of elasticity. Glycation also generates oxidative stress and inflammation, further damaging connective tissue and slowing repair. The result is skin that looks dull, thin, and less resilient. Reducing refined sugars and supporting the body's natural defenses with antioxidants and nutrients such as **benfotiamine, carnosine, and lipoic acid** can help limit glycation and preserve youthful skin integrity.



Sea Buckthorn Berry Oil and Wrinkle Depth

Rich in **omega-7 (palmitoleic acid)**, carotenoids, and antioxidants like vitamins C and E, **sea buckthorn berry oil** nourishes the skin from within and helps protect against oxidative and UV-induced damage that accelerates wrinkling. Studies show that regular oral or topical use can **improve skin hydration, elasticity, and reduce wrinkle depth**, largely by enhancing the lipid barrier and stimulating collagen synthesis. Its unique fatty acid profile supports skin repair and regeneration, making sea buckthorn a valuable ally for maintaining smooth, supple, and youthful-looking skin.

A close-up photograph of a person's hand pinching the skin on their thigh. The skin shows signs of cellulite, with visible dimpling and uneven texture. The person is wearing white underwear. The image is overlaid with a semi-transparent dark grey filter.


Cellulite?

Not really a “skin” problem, but let’s take a look!

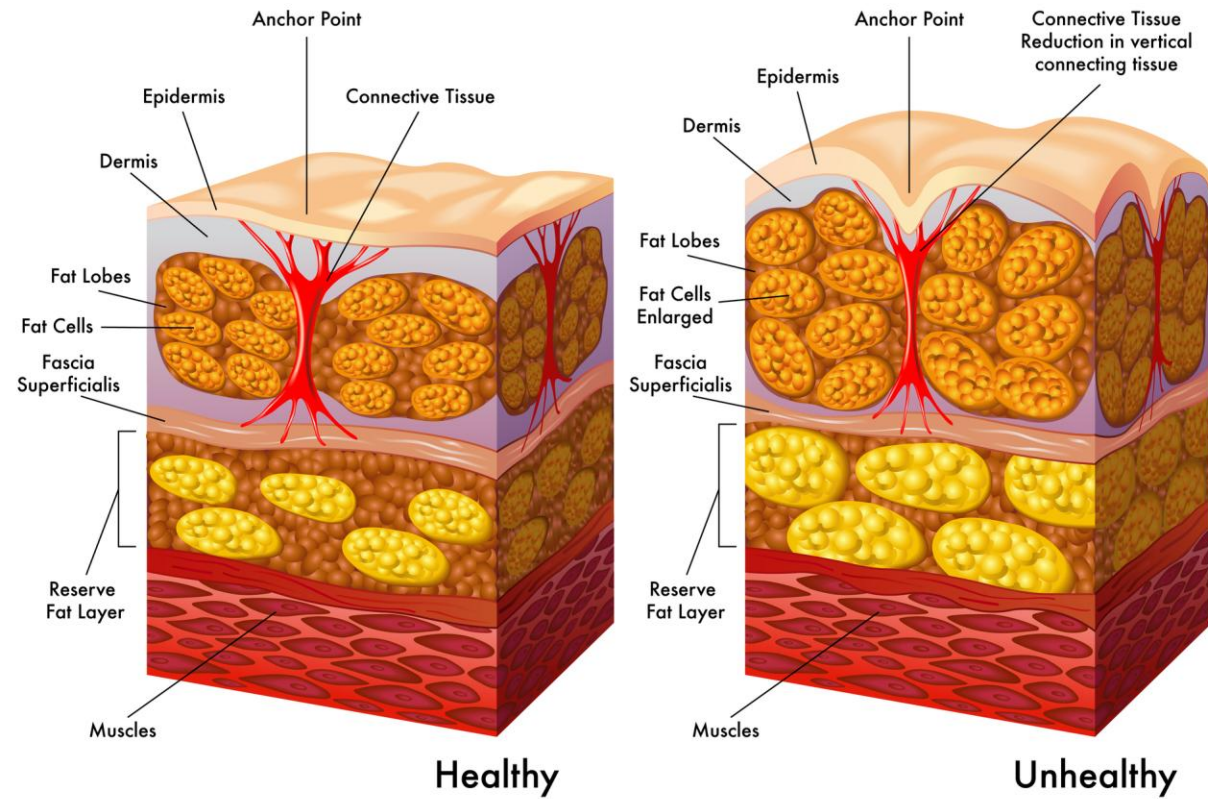


CELLULITE: The Dimpling Mystery

- **Not a fat problem, either** —primarily a **connective tissue** issue
- **Fibrous septae** (collagen bands) tether skin to deeper tissues; when these tighten and fat cells push up, dimpling occurs
- More common in women because:
 - Vertical collagen structure vs. crisscross in men
 - **Estrogen** effects on circulation, fat storage, and collagen
 - Thinner skin and reduced collagen with age
- **Contributing factors:** sluggish **lymphatic flow**, poor circulation, inflammation, and collagen breakdown
- **Supportive strategies:**
 - Stimulate **lymph & circulation** – dry brushing, massage, movement
 - **Collagen support** – vitamin C, amino acids, silica
 - **Topical support** – caffeine, DMSO, botanical actives

 We'll dive deeper into lymphatic flow and drainage in next week's *Body Parts!* webinar.

The Formation of Cellulite



A high-angle, top-down photograph of a person's legs and feet on a sandy beach. The person is lying down, with their legs extended towards the top of the frame. Their feet are at the top, and their legs curve slightly. A white, wide-brimmed straw hat with a textured, woven pattern is positioned in the lower-left foreground, partially obscuring the person's legs. The sand is light-colored and shows some shadows and ripples. The overall scene is bright and sunny.

Sun Exposure

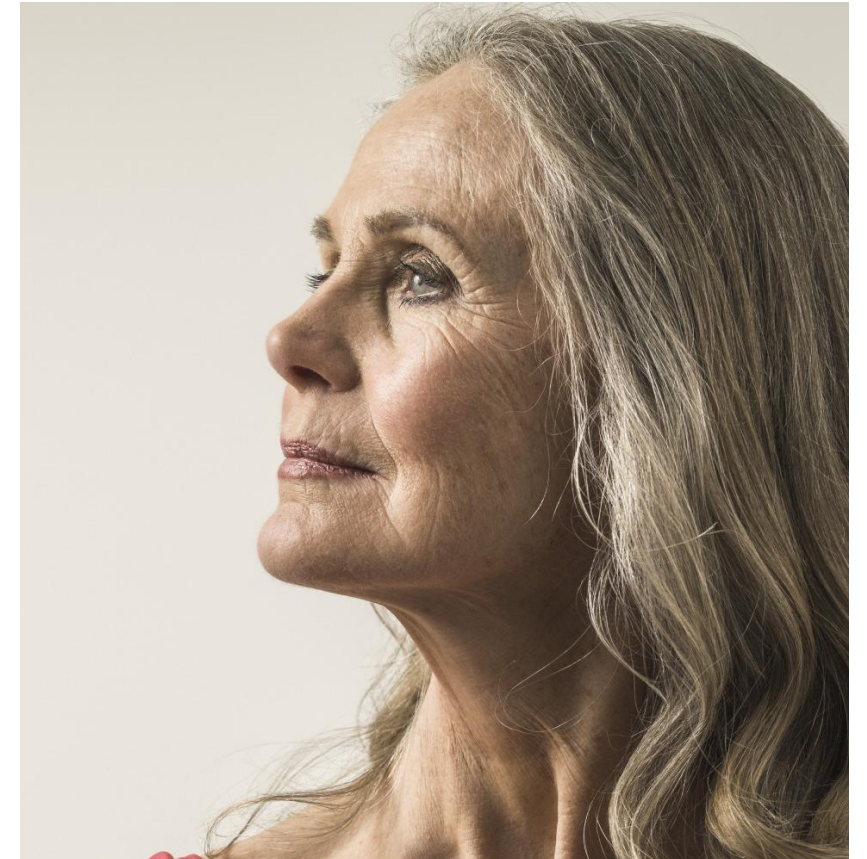
Friend or Foe?



Sun Exposure: Friend or Foe?

Sunlight is both essential and potentially damaging—it's all about *how much* and *how wisely*. The skin depends on ultraviolet **UVB rays** to produce **vitamin D**, a hormone critical for immune health, bone strength, and even mood. Gentle, moderate exposure that gradually develops a light tan strengthens the skin's natural defenses and enhances resilience. However, **excessive or burning exposure** causes oxidative stress, DNA damage, and breakdown of collagen and elastin—leading to wrinkles, age spots, and increased cancer risk. The real danger isn't thoughtful sunlight; it's the cycle of burning and over-tanning. A single blistering burn can permanently alter the skin's immune surveillance, while years of habitual tanning create the “leathery” appearance of photoaged skin.

Rather than blocking all sunlight with daily sunscreen, it's best to **build tolerance gradually**, expose larger areas briefly, avoid the harsh midday hours, and protect when necessary—such as at high altitudes, reflective surfaces, or for fair, easily burned complexions. In this balanced approach, the sun becomes an ally in health rather than a foe of beauty.



Smart Sun Habits for Healthy Skin

- **Build exposure gradually** — begin with just a few minutes daily, increase slowly as skin adapts.
- **Aim for light color, not constant tanning** — a gentle golden tone signals melanin protection; deep, ongoing tanning signals damage.
- **Avoid burning at all costs** — even one blistering burn raises future cancer risk.
- **Best times:** morning or late afternoon; avoid strong midday UV (10 a.m.–2 p.m.).
- **Nourish from within:** antioxidants (vitamin C, E, carotenoids, polyphenols) help neutralize UV-induced free radicals.
- **Use physical barriers** when needed — hats, clothing, shade — reserve sunscreen for prolonged or high-risk exposure.
- **Hydrate and repair afterward** — aloe, sea buckthorn, or antioxidant oils soothe and restore.







Diet and the Skin:

Beauty from the Inside Out

From the Inside, Out!

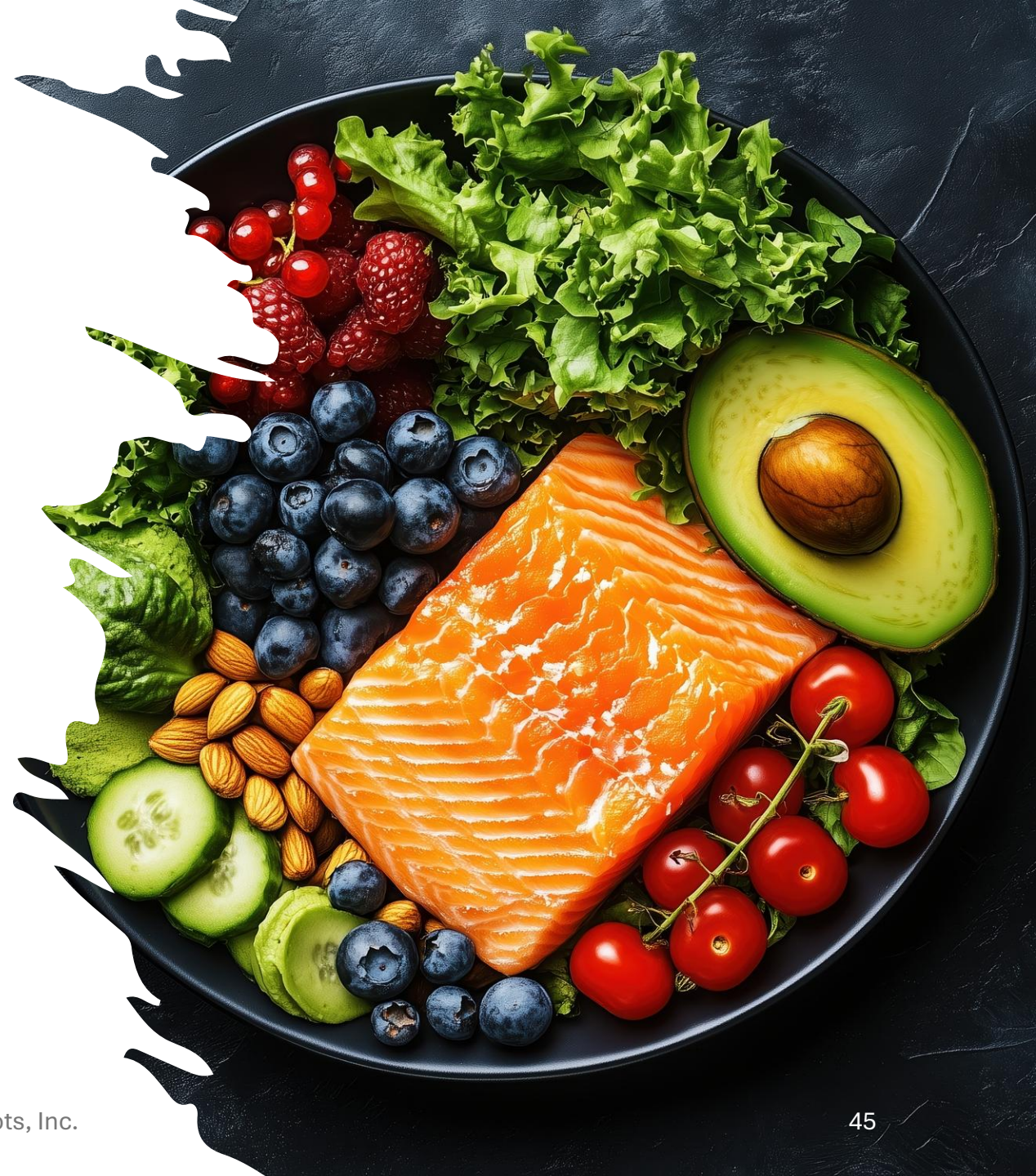
Healthy, radiant skin begins in the kitchen. A **well-balanced, whole-food diet** supplies the building blocks for collagen, hydration, and repair. Think **lots of color**—vibrant fruits and vegetables rich in antioxidants that neutralize free radicals and reduce inflammation. Include **high-quality animal foods** like eggs, fish, and grass-fed meats for amino acids, zinc, and fat-soluble vitamins A, D, and E that feed the skin from within. Don't fear **healthy fats**—olive oil, avocados, nuts, seeds, and omega-3-rich fish keep cell membranes supple and moisture locked in. Avoid **refined sugars and processed foods**, which accelerate aging through glycation and oxidative stress. Finally, **hydration is non-negotiable**: pure water, mineral broths, and watery fruits and vegetables keep circulation flowing and the skin glowing. Nourish the inside, and the outside naturally reflects it.





5 Foods for Glowing Skin

- **1 Berries** – Blueberries, raspberries, and strawberries brim with **vitamin C** and polyphenols that guard collagen against oxidative damage.
- **2 Salmon (and other cold-water fish)** – Rich in **omega-3 fatty acids**, they calm inflammation, support hydration, and keep the skin supple and smooth.
- **3 Avocado** – Packed with **vitamin E** and **monounsaturated fats**, avocados nourish cell membranes and boost elasticity.
- **4 Leafy Greens** – Spinach, kale, and arugula deliver **chlorophyll, carotenoids, and magnesium** to detoxify and oxygenate tissues.
- **5 Bone Broth** – A natural source of **collagen, glycine, and proline**, strengthening connective tissue and reducing wrinkle depth from the inside out.
- 🌿 “Feed your skin as well as you feed your soul.”





Nutritional Supplements for Skin Health

Alongside a nutrient-rich diet, key supplements can further protect and rejuvenate the skin. Begin with a **well-rounded multivitamin/mineral** to cover foundational nutrients needed for repair and renewal. **Glutathione**, the body's master antioxidant, helps detoxify cells and defend against oxidative and environmental damage that accelerates aging. **Sea buckthorn berry oil**, rich in omega-7, supports hydration, elasticity, and smoother texture. **Benfotiamine**, a special form of vitamin B₁, helps prevent glycation—protecting collagen and slowing wrinkle formation. And **true vitamin A (retinol)** promotes healthy cell turnover and restores resilience from within. Add extra **antioxidants** such as vitamins C and E, carotenoids, **sulforaphane**, and polyphenols for comprehensive defense and glow. Together, these nutrients nourish the skin at the cellular level, enhancing vitality, tone, and youthful radiance.



In Closing – The Skin You're In: Take Care of It

Your skin isn't separate from the rest of you—it's a living reflection of your overall health and vitality. Every choice that nourishes your body, calms your mind, and supports your inner balance also shows up on the surface. The same nutrients that strengthen bones, energize cells, and support the heart also build resilient, radiant skin. The good news? Caring for one "body part" always benefits the others, because the body works as one wondrous whole. When we eat well, move often, rest deeply, and live with gratitude, the skin simply reveals that harmony—glowing proof that true beauty and health are inseparable.



Thanks for Joining Me!

Rebecca Montrone, BS

[Wondrous Roots | Holistic
Nutrition | Keene, NH, USA](#)

*“You have more power than you
know!”*

