Skin cancer is the most common form of cancer in the United States with more than 2 million cases diagnosed each year. The large majority of these are slow growing, non-melanoma skin cancers (NMSC) but early detection is important to prevent lesion infiltration, disfigurement and possible loss of function as well as recognition of the rarer but more dangerous melanoma lesions (Mahon SM, 2011). As herbalists, naturopaths and integrative health practitioners we pride ourselves on client-centered care, taking the time to do a thorough and extensive client intake. In this role, it is important that we have the basic skills to recognize and distinguish a variety of skin conditions including cutaneous skin lesions. This pictorial presentation seeks to educate herbal and integrative health practitioners on the appearance of both benign and malignant skin lesions and possible herbal recommendations for the prior. We will briefly cover skin physiology and pathophysiology, methods of clinical diagnosis, associated risk factors and identifying features of a variety of common skin lesions. This in turn, will aid the practitioner in knowing when to refer the client on. Herbal protocols for support and prevention of recurrence as well as case studies will be covered.

As a former wound care nurse, my herbal clinic seems to attract a variety of skin conditions. I probably see more than my fair share of common skin conditions such as psoriasis, seborrheic dermatitis, eczema, lichen planus, bacterial and fungal skin infections, unspecified urticaria shingles, leg ulcers, tick and spider bites and various warts, boils and skin tags. These conditions for the most part, have been well covered by herbal protocols at many conferences and herbal and natural therapy textbooks.

I am also often asked for my opinion on other types of cutaneous skin lesions and have been able to identify a number which I felt wise to refer on. Skin cancers, common as they are, seem to fly under the radar. I do believe there is a growing awareness on the importance of their recognition, particularly with the aging population in the US.

Dermatologists are well versed in identifying possible suspicious skin lesions which are sent off for histological examination to confirm diagnosis and then excised as required but beyond that...
treatment they often have nothing more to offer patients when dealing with basal and squamous cell carcinomas besides a recommendation to return in 6 or 12 months’ time for another visual once over (NCI, 2014). Treatment for melanoma has improved in recent years but rarely are patients given any recommendations for preventing possible reoccurrence. I believe there is a wider role, we as herbalists can play in the supporting the body with nutrients, herbs and topical treatment in these skin conditions.

Skin Basics: Skin Physiology

As you can see in the diagram above, the skin consists of three separate layers which include:

**Epidermis**

- The epidermis is the thin, protective outer most layer which consists of layers of stratified squamous cells and basal cells which continually shed and rebuild the skin’s surface. This layer has no blood vessels and thus must be supplied with nutrients by lower levels of the skin.
- The basal cell layer lies in the deepest part of the epidermis. It sits on top of the basement membrane, just above the dermis. These cells are round in shape and divide continually. The new basal cells mature or undergo keratosis, pushing more mature cells toward the surface of the skin. The older cells in turn, develop into flattened squamous cells.
- Melanocytes are also found mostly in the basal cell layer. This cells produce melanin, the substance which gives skin its pigment. When the skin is exposed to the sun’s ultraviolet rays, the melanocytes produce more melanin. This in turn, help protect the skin from the sun’s ultraviolet radiation (UVR)
- Above the basal cell layer, lies the more prolific squamous cell layer. It is the outer most part of the epidermis and is mainly made up of keratinocytes, named for the protein keratin which they contain. Keratin helps form a durable surface which protects the skin from injury.
- As keratinocytes mature and move upward they flatten out and become scale-like. Once near the surface they die and are shed and replaced continually by new cells growing in the basal layer (ACS, 2014).
- The epidermis also contains two other types of more specialized cells: Langerhans cells (immune response) and Merkel cells (thought to make the skin sensitive to touch).
Between the two top layers is the basement membrane, an vital functional structure which is formed from products of keratinocytes and dermal fibroblasts (collagen and laminin).

**Dermis**

- The dermis is the second or middle layer of the skin, beneath the epidermis and above the subcutis and is the thickest of the three layers. It is made up of a papillary layer and a reticular layer and is largely composed of an extracellular matrix. Collagen and elastin are produced by fibroblasts in the dermis to provide structure to the skin. The dermis has a population of immune cell types which migrate in and out of the skin to blood vessels and lymphatics; including mast cells, lymphocytes, mononuclear cells, histiocytes, and granulocytes. This layer also contains most of the skin’s specialized structures such as the blood vessels, lymph vessels, hair follicles, sweat glands, sebaceous glands and nerve endings.

**Subcutis or Hypodermis**

- This layer is mainly composed of adipose tissue (fat) and is considered a protective layer for body organs and to prevent body heat from escaping (Wingfield, 2012).

**Skin Function:**

The skin is our largest organ and has a wide variety of functions. First, the skin is an important barrier preventing excessive fluid and temperature loss and providing protection against bacterial, viral and fungal agents as well as minor injuries. Skin-associated lymphoid tissue is one of the largest parts of the immune surveillance system (www.cancer.ca, 2014). In these roles it:

- Protects the body from heat, sunlight, injury and infection.
- Regulates body temperature by keeping heat in or allowing it to escape via adipose tissue and sweating.
- Regulates and prevents fluid and electrolyte loss
- Rids the body of waste via sweat glands
- Monitors the environment by sensing cold, heat, pain and pressure.
- Stores water, fat and Vitamin D.
- Has major adaptive and innate immunity functions.
- Adaptive immunity: TH1, TH2, and TH17 response
- Innate immunity: many peptides= antibacterial and antifungal capacity.
- Immune surveillance against cancer. (Immunosuppression, which occurs during organ transplant, is a significant risk factor for skin cancer).
• It is our presentation to the outside world and is significant for communication through facial expression and hand movements. (uchospitals.edu, 2014)

**Benign and Hyperplasia Cutaneous Skin Lesions**

**Seborrheic keratosis**

![Seborrheic keratosis](clevelandclinicmededu)

Seborrheic keratoses are the most common benign tumor of the skin. They present as scaly, brown plaques or crusty patches that appear to be ‘pasted on’ to the skin’s surface. They often vary in size and thickness and occur on most body surfaces except the palms, soles, and mucosa. They tend to be more common in older adults, particularly if they have a genetic predisposition to them. They aren’t considered serious unless they present as a Leser-Trélat sign.

(clevelandclinicmededu)

**Dermatosis papulosa nigra**

![Dermatosis papulosa nigra](clevelandclinicmededu)

Dermatosis papulosa nigra is a condition of darker pigmented plaques which look similar to seborrheic keratoses and acrochordons (skin tags). These growths are common and usually are found on the face and neck, particularly around the eyes of darkly pigmented persons. About 50% of the black population has these benign growths, and women are more affected than men by a ratio of 2 : 1.
Sebaceous hyperplasia.

Sebaceous hyperplasia is a benign enlargement of sebaceous glands surrounding a follicle. These stand out as small flesh-colored to yellow papules, on the face of adults. They can be numerous and are often mistaken for basal cell carcinomas but are benign in nature. They are more likely to be seen in men & those who have had organ transplants.

Lentigines (liver spots)

Lentigines are strongly pigmented macules or patches that can resemble moles (nevus). Mainly pale tan to brown, they usually appear in white adults & increase in number with advancing age. Liver spots tend to occur on areas of skin that has the most sun exposure such as the face, neck, upper trunk, forearms, and hands. These spots are the result of epidermal skin growth with increased melanocytes and thus increased pigmentation or colour. They are benign, but they occasionally transform into lentigo maligna (superficial melanoma). It is important to closely observe any rapid growth, change in color or surface contour of any ‘liver spots’, and have a skin evaluation if such change is seen. These spots do indicate excessive sun damage and an increased risk of sun-induced skin cancer so preventative treatment is warranted.

Nevus (mole): Nevus are common benign growths, usually highly pigmented or skin-colored macules, papules, or small plaques, probably derived from the growth of altered melanocytes (nevus cells). Many factors come into play in their development and growth including age, race, genetic and environmental factors (such as sun exposure).
Moles can develop anywhere on the body and rarely first appear after the early adult years. Most moles are categorized by cell subtypes: junctional, compound, or intradermal.

**Junctional nevus.**

Junctional nevi are highly pigmented macules composed of nevus cells located in the epidermis, compound nevi are pigmented papules composed of nevus cells in both the epidermis and dermis; and intradermal nevi are brown to flesh-colored soft papules with nevus cells confined to the dermis.

**Intradermal nevus.**

The blue nevus is a well-circumscribed, blue-black, round, raised papule sometimes mistaken for melanoma. Blue nevi are collections of nevus cells, melanocytes, and macrophages containing melanin in the dermis. They are usually found on the dorsal surfaces of the hands and feet.

**Blue nevus**

**Cherry angiomas** are benign vascular growths, that manifest as small red papules or macules, that tend to occur in adults, increasing in number as one ages.

**Cherry angioma.**

Angiomas can appear anywhere on the body but tend to be more common on the trunk, arms and legs. They rarely cause any symptoms but can bleed if abraded.
Dermatofibromas are benign tumors of skin (fibroblast) origin, often appearing after trauma. They are firm papules or plaques with a dark red to brown color and are usually found on the arms and legs.

Mainly asymptomatic, they can occasionally become itchy or irritated. If manipulated, they will dimple or appear to retract.

**Acrochordon (skin tag):** Acrochordons are flesh-colored to brown soft papules often on ‘stems’ commonly found on the neck, face, underarm and groin.

Increased numbers of skin tags tend to occur in obesity and pregnancy. They rarely cause problems but can be considered unsightly and occasionally can become irritated from clothing or jewelry (Silver, 2003).

All above pictures from Cleveland Skin Clinic unless otherwise labeled.

**Precancerous Skin Lesions**

**Actinic Keratosis**
Actinic keratosis are rough, scaly, brown, red or pink patches of skin on commonly exposed areas of the body such as the face, ears, lower arms and hands, particularly fair-skinned people who have had previous sun damage. These plaques are the most common form of pre-cancer and can develop into squamous cell carcinoma.
Other precancerous skin lesions include actinic cheilitis (on the lips), Bowen's Disease (superficial SCC that hasn't spread), and leukoplakia (disease of the mucous membrane).

(Skin Cancer Foundation, 2014)
Actinic (Solar) Keratosis

- Usually middle aged persons
- M>F
- Due to prolonged and repeated solar exposure (esp UVB)
- Lesions may be tender
- Painful if excoriated
- Skin coloured to yellow/brown
- Mostly <1cm
- DDx – SCC or superficial BCC
- 1:1000 transform to SCC

Actinic Keratosis Management

- Reassure clients that very few turn malignant
- Limit sun exposure as much as possible

Warn to be aware of the following signs to look for (possible malignant) change:

- Bleeding/ulceration
- Itchiness
- Increase in size
- Topical herbal management with first with antioxidants
- If not resolved over 2-3 months, add use of escharotics
- Cryotherapy or excision if suspicious or unresolved
- Assess vitamin D levels and supplement
- General Immune and antioxidant support

What is Skin Cancer?

Skin cancer is the abnormal growth of skin cells. It usually develops where there has been excess exposure to the sun &/or sun damage but can occasionally occur in areas rarely exposed.
Increasingly common, 1 in 5 Americans will develop some form of skin cancer during their lifetime. (Skin Cancer Foundation, 2014)

There are three major types of skin cancer:

• Basal cell carcinoma,
• Squamous cell carcinoma, and
• Melanoma.

The Centers of Disease Control and Prevention (CDC, 2014) estimates that about 80% of skin cancers are basal cell, which rarely spread to other parts of the body. Another 15% are squamous cell, which are much more likely to spread; and 5% are melanoma, which spreads easily if not detected early.

Basal and squamous cell carcinomas are slow-growing and if treated in their early stages are nearly 100% curable, according to the Skin Cancer Foundation.

• Other less common types of skin cancer include Kaposi's sarcoma, Merkel cell carcinoma, and sebaceous gland carcinoma.

**Non Melanoma Skin Cancer (NMSC)**

**Basal Cell Carcinoma (BCC)**

Basal cells make up the lowest layer of the epidermis, the basal layer. Cancer that originates from this layer are called as basal cell carcinomas or BCC’s. They are most common on the scalp, neck, face, ears and arms. They tend to be is a slow-growing cancer that rarely spreads to other parts of the body but 5-10% of lesions can be logically aggressive and resistant to treatment. They may invade bone and cartilage, and if not treated appropriately and early, it may be very difficult to eliminate.

Appearance: Basal cell carcinoma may appear as a flat, scaly red patch or a smooth, raised pearl gray/yellow or waxy bump. Size can vary from a few millimeters to several centimeters. As the lesion progresses, the skin covering it becomes more fragile and will bleed easily. They are often depressed in the middle and may be ulcerated or covered with a scab. As the tumor grows, it destroys healthy structures in its path, including nerves, muscles, and blood vessels.

(Columbia Uni, 2009)

**Squamous cell carcinoma:**
**Squamous cell carcinoma** (SCC) is the second most common form of skin cancer, with over 200,000 new cases per year estimated in the United States. Squamous cell cancer originates in the middle layer of the epidermis. Most SCCs are easy to treat if identified early and treated appropriately but they are typically more aggressive than BCC’s and can cause disfigurement and may spread (metastasize) to other organs in the body. They typically appear as red or brown, scaly, rough skin lesion, on sun-exposed areas such as the hands, head, neck, lips, and ears or as a small, smooth, shiny, or waxy bump. ([http://www.skincancer.org](http://www.skincancer.org))

**Dysplastic naevi**  

[DYSPLASTIC NEVI](http://www.skincancer.org) (atypical moles) are unusual benign moles that may resemble melanoma. There is an increased risk of developing single or multiple melanomas in people who have this pattern of moles, the more they have, the higher the risk (ie those with 10 or more have 12 times the risk of developing melanoma compared to the general population).

- Client education is recommended by GP or dermatologist
- Self-check every 3 months after the age of 40
- Through screening every year by professional

**Melanoma**  

Less common than other types, melanoma is by far the most dangerous, causing about 75 percent of all skin cancer-related deaths. Each year there are over 60,000 cases of melanoma diagnosed. It occurs in the skin cells that create melanin (melanocytes) and manifests as black or brown moles or lesions that follow an ABCDE pattern in their irregularities:

- Asymmetrical shape
- Border irregularities
- Color
- Diameter
- Evolution of the lesion

(American Melanoma Foundation, 2014).

**The Four Major Types of Melanoma**

- Superficial spreading melanoma: The most common type accounting for about 70% of all cases, lesions are usually flat or slightly raised, irregular in shape, and contain varying shades of tan, black, blue and brown. It travels along the top layer of the skin for a fairly long time before
penetrating more deeply. It can occur at any age and is most common in younger people. It is most likely to occur on the trunk in men, the legs in women, and the upper back in both

- Lentigo malignant melanoma: Usually affects the elderly; involves large, flat, brownish lesions
- Nodular melanoma: Can be dark blue, black, or reddish-blue, but may have no color at all. It usually starts as a raised patch.
- Acral lentiginous melanoma: The least common type; typically affects the palms, soles of the feet, or under finger and toenails. (AAD, 2014)

Cutaneous melanoma

- 4th most common cancer
- 1/14 male and 1/23 female lifetime risk
- 2nd most prevalent cancer
- 9th most common cancer causing death
- Major public health concern
- Rate continues to climb worldwide

Risk factors for cutaneous melanoma
1. Increasing age
2. Previous skin cancer
3. Dysplastic naevi
4. Pale skin, blonde/red hair
5. Prior sun exposure/sun burns
6. +ve FHx (first deg relative increases risk x 2)
7. M>F
8. Intermittent UV exposure and early childhood exposure to UV radiation to be greatest risk factors (level III-3)

Strategies with Skin Cancers

Integrative/Complementary Medicine Goals

1. Primary prevention
2. Secondary prevention
3. Adjuvant management post diagnosis
4. Preventing recurrence post diagnosis/excision.

Primary Prevention for clients with strong risk factors:

- Dietary phytochemicals – Pentacyclic triterpenes (lupeol, betulinic acid, oleanolic acid)
  curcumin, resveratrol, green tea polyphenol epigallocatechin gallate
- Extreme sun light avoidance but gentle skin conditioning
- Vitamin D Supplementation
- Selenium Supplementation
- Immune System Support

Sun Exposure and Vitamin D

- UVB converts 7-dehydrocholesterol to vitamin D3
- Skin is main source besides supplementation
- Food limited source (vitamin D2) (Fuller & Casparian 2001)
- Research suggests sun exposure/higher activity of the Vitamin D may reduce mortality from melanoma
- Vitamin D has an anti-proliferative effect yet sun exposure is a proven risk factor for all skin cancers-key is short exposure at non-peak times (peak=10am-2pm).
- Regular/daily sun exposure is not correlated with an increased risk of BCC’s & melanoma but prolonged skin exposure to sunlight breaks down vitamin D in the skin.
- Sunscreens have not be shown to reduce the incidence of melanoma.
- In melanoma, higher Vitamin D levels at diagnosis predicts longer survival time from diagnosis.

In all skin cancers:

- Intermittent extreme sun exposure is a major risk factor and risk is higher when other risk factors are present.
- Lack of skin conditioning to sun lowers serum vitamin D
- Is intermittent sun exposure + low vitamin D a risk factor for developing cutaneous skin cancers or is it just the sun exposure alone? Need more research!
- Excessive sun exposure breaks down vitamin D
- Low Vitamin D levels plays an independent role in increased melanoma development. (Grant, 2009)

A suggested guide to Vitamin D supplementation

Aim for levels around 150-220nmol/L
1000 IU/day unlikely to raise blood levels >100nmol/L
Start with 5000-10000IU/day for 2-3 months and recheck levels.
Maintenance dosage of 1000 IU to 5000 IU/day
Some people may require up to 30-50,000 IU per day and higher maintenance dose of 5000 – 10,000IU/day
Difficult to predict maintenance dosage therefore 6/12 bloods for levels and dose adjustment.
Also check Vitamin A levels
Polymorphisms in the vitamin D receptor (VDR)
Some people need much higher Vitamin D levels, particularly in winter months

**Lupeol**

Triterpene found in olive, mango, strawberries, grapes and figs.

General actions:
- Anti oxidant
- Anti inflammatory
- Anti mutagenic

Lupeol – pre clinical/ Lupeol in vitro (30mmol/L)
- Induces differentiation in mouse melanoma cells
- Significant antitumor-promoting activity in a two-stage model of mouse skin carcinogenesis
- Induces cell cycle arrest (G1 phase) followed by apoptosis of human metastatic melanoma cell line
- Inhibition of tumorigenicity of melanoma cells via a number of cellular pathways. (Saleem et al, 2008)

**Betulin/betulinic acid**

- Betulin  reduced form of butulinic acid
- First isolated in 1788
  - Outer bark of white birch trees, up to 22% w/w
- Chaga mushrooms (Inonotus obliquus) live on birch trees and concentrate betulinic acid
- Potent anti-melanoma compound
- Induces apoptosis via mitochondrial damage (a p53 independent pathway)
- Activity via numerous cellular pathways
- Decreases mitosis via arresting cells in G0/G1 phase. (Mallauer et al, 2009)

Betulinic acid - pre clinical
- First in vivo studies in 1995
  - 50mg/kg (sc injection) every 4 days for 6 injections
  - Significant tumor regression
  - No toxicity to normal cells up to 500mg/kg
- Oral dosing at 10-20mg/kg similar outcomes (Mallauer et al, 2009)
• Human conversion = 800µg – 1.6mg/kg
• Dose of 56mg to 112mg/dose of pure betulinic acid (70kg human)

**Turmeric:**

Turmeric (Curcuma longa) is commonly used for its anti-inflammatory properties.

Several early animal and laboratory studies report anti-cancer (colon, skin, breast) properties of curcumin.

Many mechanisms =

• Antioxidant activity,
• Anti-angiogenesis (prevention of new blood vessel growth)
• Direct effects on cancer cells.

**Cinnamon research 1 – pre clinical**

• In vivo mouse model of melanoma (Kwon et al, 2009)
• 400µg/g mouse weight purified cinnamon aqueous extract (oral and sc injection)
• End points – tumour size after 30 days, CD8+ T cell activity and angiogenesis
• Results (oral and s/c injection):
  • Upregulation of cytolytic CD8+ T cells in tumour draining lymph nodes
  • Decreased tumour size
  • Down regulation of HIF-1α and Cox – 2: both pivotal in tumour progression
  • Decreased angiogenesis and metastasis
• Dose of 2.2gm/dose (70kg human)
• Approximately 4ml of a 1:2 cinnamon extract

**Prevention**

• Don’t forget to use Sun Protection
• Use sunscreen (at least SPF 15) or cover your skin when you’re outdoors—or stay in the shade.
• Hats and UPF-rated clothing can help protect you when you need to be in the sun for a long time.
• Don’t use sunlamps or tanning beds.

**Topical management for benign/hyperplasia skin lesions**

Topical applications: 2 types- Anti-oxidant or Escharotic

**Antioxidant:**

• Betulina (Birch)
• Boswellia carterii (Franincense)
• Cinnnamomum
• Curcuma longa (Turmeric-topical and oral)
• Elettria cardamomum (Cardamom)
• Larrea tridentate/divaricarta (Chaparral)
• Rubus fruitcosus (Blackberry)
• Taxus brevifolia, bark-Yew
• Yucca glauca
• Pomegranate Seed Oil (Hora, 2003)
• Sea Buckthorn oil

**Escharotic**

• Latex based: Milkweed, Fig, Euphorbia

Other topical agents:

• Chelidonium major
• Phytolacca Americana (pokerooot)
• Podophyllum peltatum (mayapple)
• Sanguinaria canadenis (bloodroot)
• Papaya

Research:

• *Euphorbia peplis*
• Active is ingenol-3-angelate
• Pre-clinical
• Rapid induction of primary necrosis w/ neutrophil mediated antibody-dependant cellular cytotoxicity

Clinical experience

• Fresh latex or sap applied discretely once daily.
• Avoid unaffected skin
• Covering with dressing
• Most resolve within 1 to 2 weeks
• Larger lesions may take longer (up to months).

**Historical**

• Violet salve (Hildegard of Bingen)
• Bloodroot, Mayapple & Pokerooot (Native Americans, Daniel Smith, Drs. Fell & Jones, Hoxey)
• German Black Drawing Salve
• Golden seal & Calendula (Patterson)
• Red Clover paste (Samuel Thomson)
• Cayenne & pokerooot (Dr Christopher)
• Bloodroot with antimony & zinc (Dr Mohs)

**Classic application:**

1\textsuperscript{st} salve: Escharotic/enucleating

Poultices to soften

2\textsuperscript{nd} salve: Drawing/healing

**Hildegard’s Violet Salve**

- 3 parts violets
- 3 parts fat or oil (traditionally mutton tallow!)
- 1 part olive oil

Mix violets and fats together and cook down till thickened. Strain out violets and continue to cook down to a thick paste. (Can also add figwort).

Use on superficial skin plaques, cancers & ulcers, lymphatic swellings, moles, warts, localized infections, spider and snake bites.

**German Black Drawing Salve**

- 6 cups solid fat such as coconut oil, Capha or tallow
- 2 oz. dried Red Clover flower & leaf or 5 oz., fresh plant
- 1 oz. dried Comfrey root or 2 ½ oz., fresh
- 1 oz. fresh Plantain leaves or 2 ½ oz., fresh
- 1 oz. dried Chickweed or 2 ½ oz., fresh
- 1 oz. dried Mullein leaf & flower or 2 ½ oz., fresh
- 1 oz. dried Marshmallow root or 2 ½ oz., fresh
- ¼ oz. dried Pokeroot or 0.5 oz., fresh
- ¼ oz. dried Golden Seal root or Barberry bark
  (The US version also includes 1 oz. Chaparral)

Put together in an ovenproof pot or crockpot and cook at 120 C for 6-10 hours or overnight. Strain well through a fine strainer and add:

- 10-12 oz. beeswax

And heat to melt. Then add:

- 3 oz. olive oil
- 1 oz. wheat germ oil
- ¼ pint pine tar or turpentine (optional, obtain from nursery)

Do not reheat after adding pine tar or mixture will curdle.

Use a beater to whip mixture while hot then pour into small tins or several wide mouthed jar to set. Cool till firm.
Use to draw out infections of any kind. This salve was traditionally used as a part of ‘bloodless surgery’ in topical cancer treatment.

**Yellow Healing Salve**

Melt 2 oz. beeswax in 2 cups of olive oil. Add ½ cup Calendula oil then add:

- 2.5 oz. dried Golden Seal root
- 2 oz. dried Turmeric root or 6 oz., fresh root
- 1.5 oz. dried white willow bark
- 1.5 oz. myrrh or frankincense

Put together in an ovenproof pot and cook at 120 C for 3-4 hours. Strain and add: ½ cup castor oil

Use for superficial skin plaques, cancers & ulcers, localized infections, dirty wounds and recalcitrant sores.

Special Thanks to Dr Stuart Glasonbury for his intake and research
References


