Skin Health Training Pack

www.keepingskinamazing.co.uk

"Dry skin is a big issue in the UK, and it can affect people on a physical and emotional level, with sufferers often feeling self conscious or embarrassed, so trying to maintain healthy skin is very important. All sorts of factors can cause dry skin, from the environment around us, genetic disposition, and simply living day to day – in fact healthy skin can lose up to half a pint of water every day – you can double this if your skin is dry - so it's important to remember to moisturise regularly, particularly if you have dry skin."

Dermatologist, Sarah Wakelin

Nearly half of the UK adult population suffers from dry skin and over one in ten would describe their condition as extremely or very dry[1] – there's no wonder then that one in six primary care consultations are skin related[2].

This skin is an amazing organ and performs its key biological functions effortlessly every day – like regulating body temperature, providing protection from disease, and healing the countless abrasions people get throughout the year. But as a healthcare professional who takes skin care seriously, you will know that when skin is dry, it has a reduced ability to perform many of its key functions in the most efficient and effective way. Unfortunately this condition is common and can be exacerbated by a number of factors.

That's why Vaseline, with over 130 years of expertise and passion for skin, has developed this training pack, designed to provide you with all of the information you need to advise your patients on the principles of dry skin. The pack covers the anatomy of the skin, what happens when skin dries out, the causes of dry skin, how to treat dry skin, how to grade it, and an overview of dry skin conditions such as eczema, psoriasis and dermatitis. As well as being a valuable source of information, this manual provides you with the opportunity to complete a short knowledge test.

A note on how to use this training pack

Each section includes diagrams and illustrations to help you gain a full understanding of dry skin and an overview of dry skin conditions such as eczema, psoriasis and dermatitis. At the end of each section, there are exercises to help you re-cap on some of the key points. You may choose to digest the contents of this manual a section at a time or you may want to complete it in one sitting. Once you have read through all of the sections, there is a multiple choice set of questions at the end.

For more information on skin health, please visit www.keepingskinamazing.co.uk or if you have any further queries contact us on 0207 331 5434 or at info@keepingskinamazing.co.uk

The development of this pack coincides with a new range of products from Vaseline that have been especially formulated to help alleviate the symptoms of very dry skin. Each of the products in the range consists of a unique balance of humectants, emollients and occlusives. The range includes Moisture Locking Body Lotion, Relief & Repair Balm, Soothing Hand Cream and Hydrating Foot Cream. They provide instant moisturisation and an invisible barrier to help the skin retain moisture – without leaving a greasy residue.

Vaseline are proud to be corporate members of the National Eczema Society

Section 1

Introduction to Skin Anatomy

Objectives

After completing this section you will be able to:

Describe the structure and functions of normal skin

1.1. Skin structure and function

As the largest organ in the body, skin covers an area of around two square metres and accounts for 16 per cent of body weight.[3] Its function is to protect the body from the surrounding environment and prevent the body from losing water and other substances.

In order to work efficiently, the skin is made up of three layers. They are:

Epidermis

Dermis

Subcutis

Epidermis

The epidermis is the outermost layer and is made up mainly of keratinocytes with some melanocytes and Langerhans cells (Fig 1). The epidermis will vary in thickness, depending on the part of the body. For example, it is very thin on the eyelids and much thicker around the soles of the feet. It contains no blood vessels and nutrients are diffused into the epidermis from the dermis. It is the first line of defence against injury or ingress of harmful substances.

Keratinocytes – these produce large numbers of a regulatory protein called cytokines, which help to act as intercellular mediators in the generation of an immune response.

Melanocytes – these are found at the base of the epidermis and contain melanin, the pigment that turns skin brown in the sun.

Langerhans cells – these play a significant part in the skin's immune system. They derive from bone marrow and they hold onto antigens to present them to T-cells in the first line of defence against injury or contact with harmful substances.

The epidermis itself contains four layers – see diagram below.

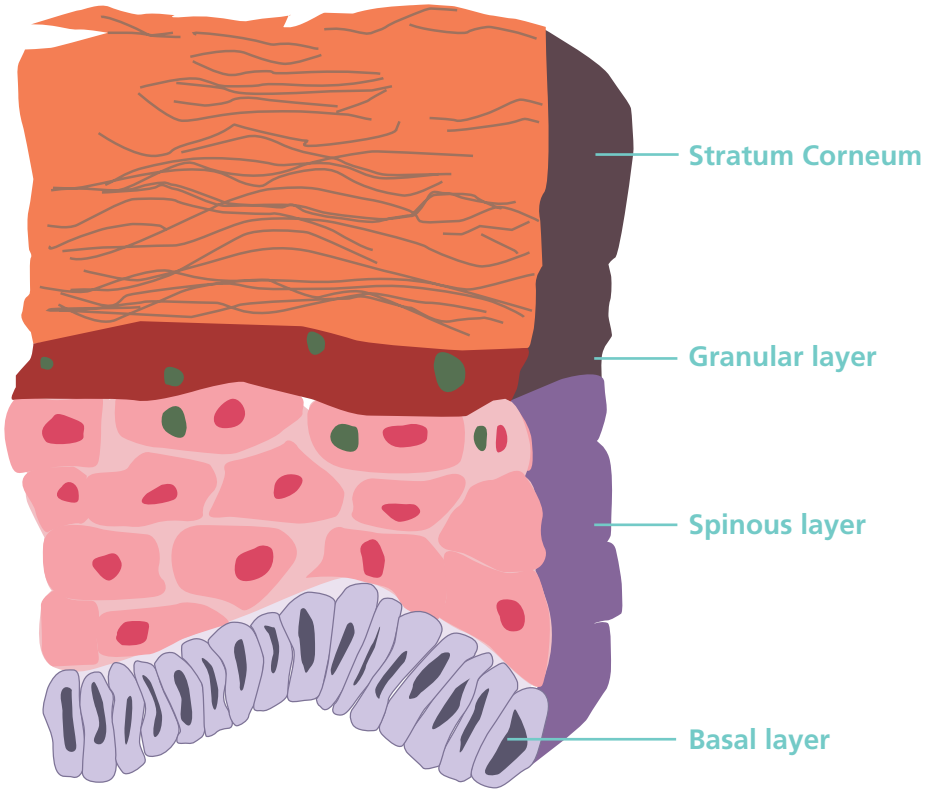

Fig 1

The Stratum Corneum (SC) – This top layer of the epidermis was historically regarded as an inert layer of dead cells, or the most superficial layer of skin. In fact, it is a metabolically active skin component. The SC is a well-ordered layer that serves as the primary defence against environmental insult and is the barrier to subcutaneous absorption.[4] Although the SC is mostly waterproof, it allows for a small but vital flux of water between surrounding tissues and the environment to maintain its functionality and integrity.

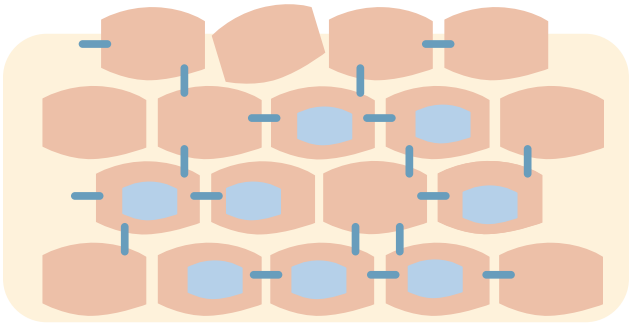

Fig 2

The SC is composed of specialised keratinocyte cells called corneocytes that are nestled in a continuous lamellar lipid layer. The corneocyte is primarily composed of a highly organised, insoluble bundle of keratins surrounded by a hardened, proteinaceous cellular envelope. Long chain ceramides are covalently bound to the surface of the corneocyte and penetrate into the lamellar lipid layer of the cell. A mixture of ceramides, fatty acids, and cholesterol, the lamellar lipid layer forms a continuous hydrophobic barrier within the SC that restricts transepidermal water loss (TEWL). Corneodesmosomes are proteinaceous structures that attach corneocytes to one another, providing the structural integrity of the SC.

Skin Fact Number One: Vitamin D synthesis takes place in the skin through the action of UV light on 7-dehydrocholesterol.

Dermis

Underneath the epidermis, we find the dermis. The dermis is made from a tough connective tissue matrix, which contains structures such as sweat glands and hair follicles. In addition, blood vessels, nerves and lymphatic vessels and muscles can be found in this layer. The primary component of the dermis is collagen and it is this substance, together with elastic fibres, that make the skin resistant to tearing, and give it its elasticity.

Sweat glands – there a two types of sweat glands which secrete a watery fluid. The first type is Eccrine. **Eccrine** glands are found all over the body and are controlled by nerves. The second type is **Apocrine**. Apocrine glands are larger than Eccrine glands and open into hair follicles.

Hairs – hairs are found all over the body except on the soles of the feet, the palms of the hand, the glans penis and the vulval introitus. There are vellus hairs, which are short, downy and light coloured, and there are terminal hairs, which are the thick, pigmented sort found on the scalp, eyebrows, pubic and beard areas.

Sebaceous glands – these glands secrete sebum to moisturise the skin and may have some protective qualities against infection.

Smooth muscle – this is a muscle bundle that attaches to the bulge region of the follicle. It is also responsible for goose pimples.

Blood vessels – skin has a rich blood supply and this plays an important role in thermoregulation (see Skin Fact Number Two).

Cutaneous lymphatics – the skin contains a rich network of lymphatic vessels.

Nerves – found in abundance, especially in the face and extremeties, nerves detect sensations of heat, pain and itch. There are free nerve endings in the dermis and a few pentrate the epidermis. Itching is related to stimulation of fine free nerve endings in the area close to the dermo-epidermal junction.

Subcutis

The subcutis lies beneath the dermis and is largely connective tissue and fat. The Subcutis supplies nutrients to the other two layers and that cushions and insulates the body.

Exercise 1

Assess your understanding of the following terms by providing descriptions below:

- Epidermis _____

  _____

- Corneocyte _____

  _____

- Dermis _____

  _____

- Thermoregulation _____

  _____

- Subcutis _____

  _____

Exercise 2

Describe the composition and function of the Stratum Corneum

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Section 2

Causes of Dry Skin

Objectives

After completing this section you will be able to:

Describe the causes of dry skin

Be aware of the psychological burden that some dry skin disorders can cause

2.1 Environment

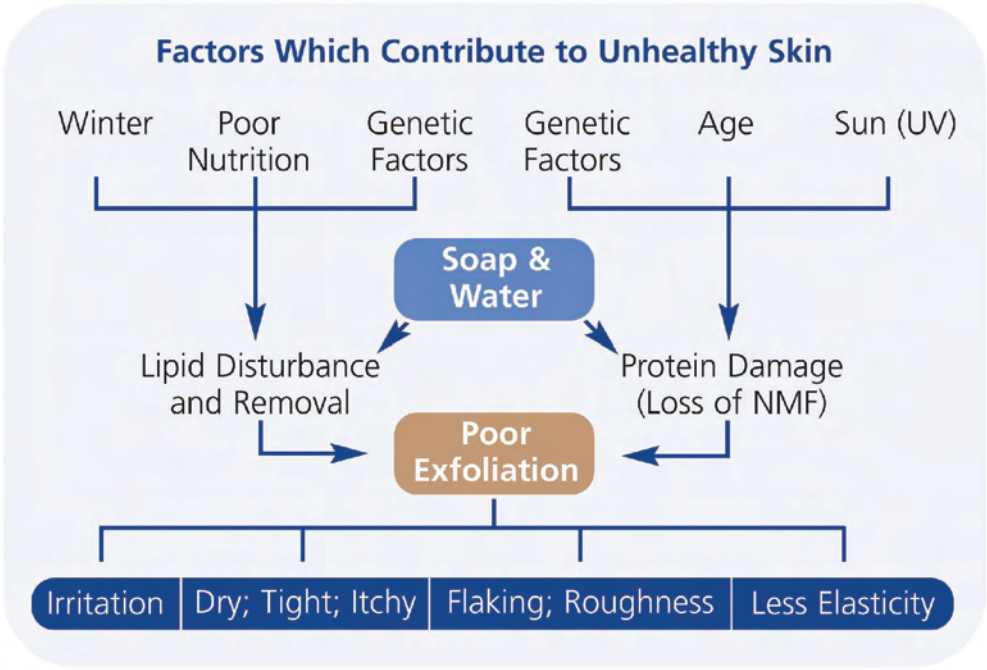

Fig 4

There are a wide range of environmental factors, which can disturb the normal function of skin and trigger a dry skin condition.

The environment is repeatedly pulling moisture away from the skin's surface, and if the air is particularly dry, more moisture gets pulled from the skin. The outer layer of the skin has an oily layer that is sometimes not retained properly because of these conditions. Also, the body is unable to produce the requisite amount of water and oil as is needed by the body. This causes the skin to dry and look dull, flaky, and lifeless.

Everyday activities such as washing with soaps or detergents and living in dry, centrally-heated homes removes epidermal lipids and dries the skin. As the skin becomes drier, there is a breakdown of proper skin mechanisms: without moisture, skin cells become stiff and inflexible, setting the stage for the skin to become cracked and damaged.

Other environmental factors, which can reduce the skin's natural moisturising factors include dry, cold and windy weather which can cause the skin to peel, flake and thicken; air conditioning, poor ventilation, chemicals and over exposure to the sun.

While skin disorders such as Atopic Eczema may be a result of genetics, the problem can be exacerbated through environmental factors such as repeated washing. An Atopic Eczema sufferer will already have a defective epidermal barrier, which is further weakened by washing. Once this occurs, inflammatory mediators are released, triggering inflammatory responses and leading to the development of full-blown eczema.

On the other hand, types of eczema such a Contact Irritant Eczema or 'Hand Dermatitis' (see section four) are a direct result of the environment i.e. repeated contact with the same substance (e.g. detergents and shampoos).[5]

Skin Fact Number Two: The blood flow and glands in skin are responsible for blood flow and sweating. Together they help to maintain a constant internal body temperature, which is known as Thermoregulation. Sweating cools the skin through evaporation. The minimum loss of fluid through sweating is half a pint per day. Skin blood flow can vary according to the degree of the blood vessel dilation. The degree of blood vessel dilation is controlled by the nervous system and causes heat loss through radiation and convection.

Skin Fact Number Three: When the epidermis is damaged or penetrated, the skin immune system gets to work. Whilst it is part of the overall immune system, it is a functionally independent unit and includes a number of mechanisms that recognise antigens and initiate propagate inflammation.

Eczema

2.2 Genetic

Dry skin can be a genetic inheritance and even infants can be seen with extremely dry skin (as shown in images). It is not an ailment that hits at a particular age or certain kinds of skin. Just like any other type of dry skin, genetic dry skin can be treated with a wide range of lotions and creams.

Racial (ethnic) differences in skin properties may explain racial disparities seen in dermatologic disorders and provide insight into appropriate differences in the management of these disorders. Objective methods studied include transepidermal water loss (TEWL), water content (WC), corneocyte variability, blood vessel reactivity, elastic recovery/extensibility, pH gradient, lipid content, surface microflora, microscopic evaluation of mast cell granules, and confocal microscopy.

Chronic actinic dermatitis

The majority of the evidence (six out of eight studies) indicates that TEWL is greater in Black skin compared with Caucasian skin.[4] TEWL measurements of Asian skin are inconclusive as they have been found to be equal to Black skin and greater than Caucasian skin, equal to Caucasian skin, and less than all other ethnic groups in different studies. Racial differences in WC, as measured by resistance, capacitance, conductance and impedance, are also inconclusive as the data are contradictory.[4]

There exists substantial evidence to support that Black skin has a higher TEWL, variable blood vessel reactivity, decreased skin surface pH, and larger mast cell granules compared with Caucasian skin. Although some deductions have been made about Asian and Hispanic skin, further evaluation needs to be done. Differences in WC, corneocyte desquamation, elastic recovery/extensibility, lipid content and skin microflora, although statistically significant, are inconclusive.[4]

Until recently, little was known about the genes that cause dry skin but research carried out by scientists at the University of Dundee has discovered a gene which causes genetic skin conditions.[6] The findings of the study revealed the gene in question produces a protein called filaggrin, which is normally found in large quantities in the outermost layers of the skin.[6] This protein is essential for skin barrier function, helping to form a protective layer at the surface of the skin that keeps water in and keeps foreign organisms out. About five million people in the UK carry one of the flaggrin mutations and consequently, have dry skin and are predisposed to eczema.

Fruit and vegetables include essential vitamins and antioxidants

Essential fatty acids are found in oily fish

Drink plenty of water

2.3 Diet

Diet plays a key role in maintaining the health of the skin. A balanced diet that contains a wide range of minerals and vitamins is essential to keep the skin functioning at its best. Without essential nutrients, the skin does not function correctly, leading to lifeless, dull, dry and often flaky patches. The key dietary factors which affect the function of skin are listed below:

- Water is of utmost importance. The body loses around ½ a pint[4] per day and if you don't replace it, the skin will begin to dry out
- Vitamin A and C are also important as these vitamins help to hold onto available moisture in the system. Vitamin A may also help strengthen and protect skin tissue. Vitamin C can also be effective for collagen production and for reducing inflammation
- Vitamin E helps protect against free radicals and maintains prostaglandin synthesis. Topically, it may reduce wrinkling, scarring and inflammation[6]
- Essential fatty acids are key in helping to reduce inflammation (sources include oily fish such as salmon or tuna, nuts and seeds and vegetable oils)
- Heavily spiced foods should be avoided, specifically in rosecea sufferers, as these can cause flushing
- High fibre foods such as wholemeal bread, brown rice and bran cereals are important in maintaining regular bowel function
- Eating five portions of fruit and vegetables a day has many health benefits, and fruit and vegetables contain essential vitamins and antioxidants, which are important for maintaining healthy skin
- Alcohol intake can also dry skin as it has a diuretic effect which may cause the body to lose fluids and essential minerals
- Zinc is thought to be useful in the fight against flaky, dry and scaling rashes
- An evening primrose oil supplement contains an essential fatty acid called linoleic acid, which is required by the skin. It may help to reduce inflammation and dryness of the skin

2.4 The Impact of Dry Skin Disorders

Dry skin and skin diseases can seriously limit activity for about 10 per cent of the population[6] and those not directly affected by skin disease can easily underestimate the effect it can have on an individual's life. It can prove problematic in all aspects of their life – from schooling, relationships and self-esteem to social, sexual and leisure activities.

Skin Fact Number Four: The scientists at Dundee University found that the gene which is a major predisposing factor in the development of dry skin conditions is also responsible for eczema associated asthma.[6]

For example, people with skin diseases commonly report episodes of rejection, such as being asked to leave a public swimming pool or to wash separately – often in the mistake that it is infectious. Children with eczema are often taunted or bullied either because of the appearance of their skin or the smell of treatments such as coal tar ointment. Such incidences can leave the individual feeling frustrated, desperate and in extreme cases, isolated.

The severity of the skin disease does not always correlate with the level of anguish it causes. For example, a case of mild dry, flaky skin on the face can sometimes have a greater psychological impact than eczema on the torso. This is due to the visible nature of the dry skin condition and the individual's perception of it. Healthcare professionals tend to assess the severity by the extent of the disease whereas patients are also aware of its impact on their lives. Body dysmorphic sufferers of dry skin can also greatly exaggerate the psychological effect of even minor skin complaints among sufferers.

It is important that pharmacists are aware of these issues and that they take them into account when responding to the needs of individual patients.

Exercise 1

List the environmental factors that can lead to dry skin:

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Exercise 2

Briefly describe the role of the following vitamins in maintaining the function of the skin:

Vitamin A _____

_____

Vitamin E _____

_____

Vitamin C _____

_____

Case study

Katy (19) is a student in a local sixth form and suffers from severe dry skin, which is particularly bad on her face, arms and legs. It is flaky in appearance and she is desperate to alleviate the symptoms. In light of what you have read in this section, how do you handle this patient and do you make any recommendations about her lifestyle?

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Section 3

Understanding and Overview of Dry Skin

After completing this section you will be able to:

Understand the anatomy of dry skin

Grade the severity of dry skin

List the various ingredients in moisturisers and describe how they work

Understand the roles of these ingredients in dry skin management

Prescribe the most effective solution for patients

3.1 What happens when skin dries out

To best understand why skin becomes dry, we need to refer to the Stratum Corneum (SC) - the very top layer of the epidermis (see section one for further information). The SC is a functional structure, helping your body to respond to the environment and maintain your skin barrier's state of health. Healthy skin naturally repairs itself but when skin becomes overly dry it struggles to function optimally.

Think of the SC as a 'brick and mortar' wall (See figure 2). The 'bricks' are corneocytes while the 'mortar' are lipids. Corneocytes are connected by proteins called desmosomes. Inside each corneocyte are Natural Moisturising Factors (NMFs) which draw moisture into the cell.

The SC regulates a natural rate of water loss in your skin, (TEWL). Normal, healthy skin loses about half a pint of water into the atmosphere a day. The TEWL process is affected by the integrity of the lipid structure and the NMF. For healthy moisturised skin, these elements regulate the rate of TEWL and help maintain the proper moisture levels in the SC.

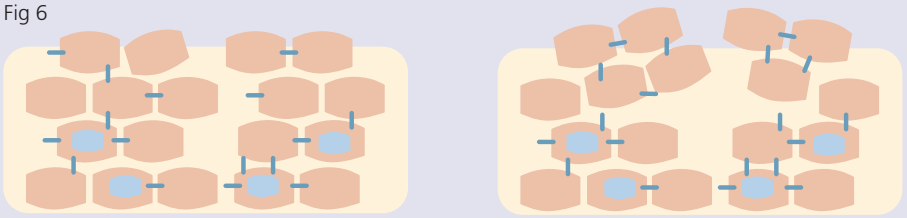
When skin dries out, there is a breakdown of proper skin mechanisms: without moisture skin cells become stiff and inflexible, setting the stage for skin to become cracked and damaged. A loss of barrier lipids further increases exposure of cells to the environment, leading to further water loss and increased skin dryness. Because skin is becoming more vulnerable, its ability to withstand environmental (e.g. extreme weather) dryness becomes impaired.

When skin is dry, the lack of proper moisture levels disturbs the skin's desquamation processes. Desquamation is the natural elimination of cells from the SC – essentially it is the sloughing off of the top-most layer of skin. When the desquamation process doesn't function properly, dead skin cells collect on your skin and become visible as dry skin flakes.

The dry skin cells accumulating on the surface feel rough and inflexible. They can catch on clothing or other fabric and lead to dry skin itch. With continued dryness, this inflexibility and tightness can lead to physical cracking of your skin which is not only painful, but further exposes skin to drying elements.

As dryness drives deeper into the SC, physiological functions of skin (such as the natural growth and maturation of healthy corneocytes) become impaired. These under-developed, immature corneocytes reach the surface in a weakened state, further reducing skin's ability to withstand dryness and naturally recover from environmental assault.

Fig 6



Normal Desquamation

- Lipid and NMF are intact to surface
- Desmosomes fully degraded
- Corneocytes shed as individual, microscopic cells

Dry Skin Desquamation

- Lipid and NMF lost; unable to maintain hydration
- Desmosomes improperly degraded

3.2 The Kligman's Criteria

In the pharmacy, signs and symptoms of xerosis (dry skin) may be described by a number of terms including pruritus, flaking, chapping, burning, erythema, pain, scaling, stinging and tightness. The Kligman's criteria is generally regarded as the standard for the visual clinical assessment used to diagnose the severity of dry skin.[7] There are four gradations used to classify dry-skin severity:

Grade 1 or healthy skin, shows no visible signs of dryness and has a healthy sheen and glow.

Grade 2 indicates mild xerosis and is characterised by small flakes of dry skin and whitening of dermatoglyphic triangles (the lines that form patterns on the skin such as on the fingertips and palms of hands).

Grade 3 describes moderate xerosis with small, dry flakes that cause a light, powdery appearance. Also, the corners of the dermatoglyphic triangles start to lift.

Grade 4 characterises well defined xerosis with the entire length of a number of dermatoglyphic triangles uplifted to generate large, dry flakes. Roughness and redness are readily apparent.

There are some areas of the body that are more prone to dryness than others. For instance, skin around joints, such as elbows, knees and fingers, is subjected to flexural stress, while the palms of hands and soles of feet undergo mechanical stress. The repetitive stress endured by these areas may make them more prone to the damage of protective lipid and protein components of the SC barrier, which can lead to rough, dry skin.

3.3 Breakdown and description of ingredients in moisturisers

Not all moisturisers are as effective as each other; the right combination of ingredients is required to provide the environment dry skin needs for repair and restoration. Effective moisturisers contain a well-formulated balance of the following ingredients:[8]

Humectants – attract moisture from in and outside the skin and hold it within the SC.

Occlusives – form a layer on the surface of the skin and moisturise by retarding water evaporation.

Emollients, or oils and lipids – these spread easily on the skin and provide partial occlusion that hydrates and improves the skin's appearance and feel; certain emollient ingredients contribute to the aesthetic qualities of moisturisers as well.

Other ingredients used in moisturisers, such as alpha hydroxy acids, can act as exfoliating agents by encouraging the natural desquamation process within the SC.[9]

Table 1: Examples of humectants, occlusives and emollients

Ingredient Type	Examples	Usage
Humectants	Glycerol, hyaluronic acid, panthenol, propylene glycol, sodium lactate and/or ammonium lactate, sodium pyrrolidine carboxylic acid, sorbitol, urea	Improves visual appearance of skin Maintains water content in skin
Occlusives	Petrolatum, cocoa butter, cyclomedthicone, lanolin, mineral oil, shea butter, waxes	Protects and seals moisture in the skin Facilitates natural healing process
Emollients	Dimethicone, silicone, collagen, isopropyl myrisate, isopropyl palmitate, octyl stearate, sunflower oil, soybean or other plant oils, and jojoba oil	Contributes to the flexibility, softness and smoothness of skin Adds aesthetic properties to moisturisers

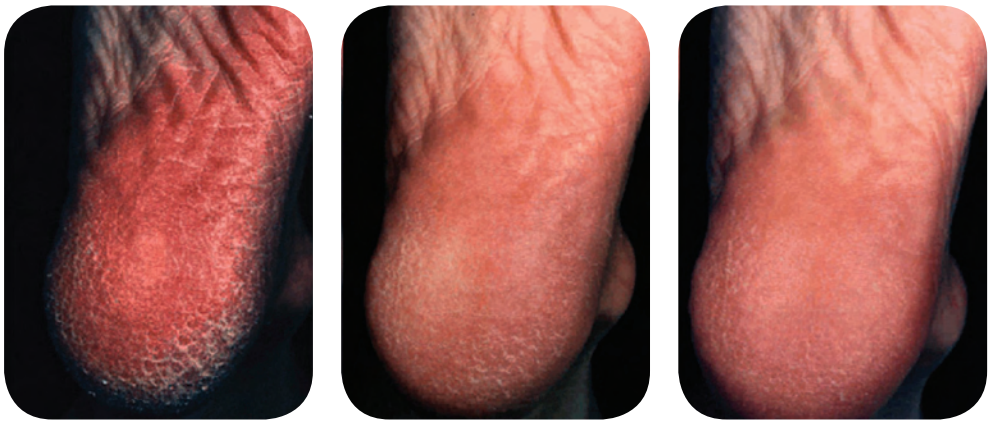
3.4 Efficacy of Ingredients

Moisturisers that encourage exfoliation are beneficial for areas that tend to accumulate dead skin e.g. heels and elbows.[10] Clinical studies show that using a moisturiser containing a humectant, occlusive, or emollient ingredient alone is not as effective as using a product that is highly enriched in more than one ingredient or contains a balance of these three moisturising components (see fig 8). However the right combination of moisturising ingredients may not be the same for any one body part or dry skin condition.

Different areas of the body (eg. the skin of the hands, feet, elbows and knees) have distinct moisturising needs based on the nature and location of the specific dry skin condition, as well as the everyday functional demands on that body part. There are a myriad of products on the market offering a wide range of combinations of moisturising ingredients, and most of these offer some degree of therapeutic benefit to dry skin.

It is also important to consider the feel of a product when choosing or recommending a product containing a balance of moisturising ingredients. A patient may be less likely to use a moisturiser that does not absorb quickly or feels sticky and greasy to the touch, compared with one that is easily absorbed and leaves less residue, in particular when they are regularly moisturising their hands.

Fig 8



From this to this in 4 weeks

Regular use of emollients can have a fast effect. These images were taken over the space of four weeks, and the subject regularly applied Vaseline Intensive Rescue hydrating foot cream.

Humectants

Humectant ingredients can improve the visual qualities of skin on contact by attracting moisture that hydrates the SC so skin appears smoother and feels less dry.[8] However, humectants in high concentration can be sticky and require artful balance of formula aesthetics. Glycerol is one of the most commonly used and effective humectant ingredients that are also found naturally in the skin. Recent studies have demonstrated a role for glycerol in maintaining the water content within skin.[9] Other effective and common humectants include sodium lactate and/or ammonium lactate, sodium pyrrolidine carboxylic acid and urea. Humectant ingredients are best used in conjunction with occlusive ingredients to protect and seal moisture in the skin.

Occlusive

Occlusive ingredients create a hydrophobic barrier on the skin surface that prevents water from evaporating out of the skin and causing dryness. They also facilitate skin's natural healing process by providing protection from further damage. However, high levels of occlusives can have a negative impact on the feel of a product since many of them have a strong, unpleasant odour, along with a greasy, sticky feel. Petrolatum is an example of an effective occlusive, and is made up of a mixture of waxes, oils and paraffins with a melting point similar to the body's temperature. When petrolatum is placed on the skin, it penetrates deep into the SC and then reforms its crystalline structure once it is embedded. This unique property of petrolatum, along with a biochemically inert profile, is what makes it such a substantial and effective occlusive.

Skin Fact Number Five: A report showed that patients often view the disabling effects of skin disease as comparable to or worse than to living with conditions such as angina, asthma and arthritis.[11]

Emollients

Emollients contribute to the flexibility, softness and smoothness of skin, but, unlike some occlusives, they can also leave skin feeling greasy. One particular emollient is dimethicone, a silicone oil that adds a palatable slip to moisturisers. Many plant oils and butters are also used in moisturisers for their emollient qualities. Although some emollient ingredients may have occlusive properties, they are primarily utilised in moisturising formulations for the aesthetic properties they provide. In addition, they are typically used in such small quantities that they do not actually contribute to the occlusive quality of the moisturiser.

It should also be noted that bathing with the right bath additives can also alleviate dry skin conditions, helping to remove scabs, prevent infection and help seal in moisture in preparation for the application of emollients. Some bath additives will disperse and cloud the water whilst others will settle on the top of the water or produce bubbles.

Skin Fact Number Six: Petroleum jelly was first discovered in 1870 by Robert Chesebrough who was motivated by a passion to understand skin and an intense curiosity. Today, it is better known as Vaseline petroleum jelly and continues to be used by millions of people to treat dry skin.

3.5 Moisturiser Analysis

Table 2: Examples of Leading Moisturiser Brands

Brand Name	Humectant	Occlusive	Emollient
Vaseline Intensive Rescue range of products	✓	✓	✓
E45 Lotion		✓	✓
E45 Cream		✓	✓
E45 Itch	✓	✓	✓
DiproBase Cream		✓	
Eucerin Dry Skin Intensive Hand Cream with 5% Urea	✓		✓
Eucerin Dry Skin Intensive 10% Urea Treatment Lotion	✓	✓	✓
Nivea body Rich Care Body Moisturiser	✓	✓	✓
Neutrogena Comfort Balm	✓		✓
Oilatum Cream	✓	✓	
Doublebase	✓	✓	✓
Cetraben Emollient Cream	✓	✓	
Aveeno moisturising range	✓	✓	✓
Dermol Cream	✓	✓	✓

Exercise 1

Briefly describe what happens to the breakdown of proper skin mechanisms when skin dries out.

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Exercise 2

Put the following ingredients into their correct categories using the table below:

Glycerol, jojoba oil, lanolin, hyaluronic acid, panthenol, propylene glycol, Dimethicone, silicone sodium lactate and/or ammonium lactate, collagen, sodium pyrrolidine, carboxylic acid, sorbitol, urea, petrolatum, myrisate, cocoa butter, sunflower oil, soybean, cyclomedthicone, mineral oil, shea butter, isopropyl, isopropyl palmitate, octyl stearate, or other plant oils.

Ingredient Type	Examples	Usage
Humectants		
Occlusives		
Emollients		

Section 4

Eczema & Dermatitis

After completing this section you will be able to:

Understand the causes of eczema and dermatitis

Identify the different types of eczema

Recommend treatment for eczema and dermatitis

4.1 Overview of Eczema/Dermatitis

In some cases eczema can also be known as dermatitis and is a non-infective inflammatory condition characterised by red, sore, itchy skin. There are three classifications of eczema:

- Endogenous (caused by internal or constitutional factors)
- Exogenous (caused by external contact factors)
- Unclassified

It is not always possible to distinguish between the different types of eczema and properly diagnose the causes. It should also be noted that each of the above types can be acute or chronic.

Acute eczema arises when epidermal vesicles are produced or, in rare cases, large blisters. The dermal blood vessels are dilated so that the skin appears red and swollen. This is followed by weeping and crusting. Inflammatory cells attack the dermis and epidermis, making the skin itchy and painful.

Chronic eczema has some or all of the features of acute eczema. However, this also manifests with a scaly skin. This is caused by the thickening of the prickle cell layer and Stratum Corneum. Other symptoms include dryness, lichenification (a leathery bark like appearance), excorication and painful fissures.

4.2. Aetiology

Eczema arises when the barrier function of the epidermis is disrupted. Sometimes this is because of a defect in lipid production that normally holds keratinocytes together. The result is a higher concentration of water loss than normal, which causes dry and cracked skin. Once cracks appear, it is easier for irritants and allergens to enter the epidermis and set off inflammatory responses.

When trying to understand the causes of eczema, there is the potential for confusion as there are different types and therefore different causes.

In **Atopic Eczema** the known cause is genetic but a person who has Atopic Eczema is also more likely to develop allergies.

With **Seborrhoeic Eczema**, the cause is thought to be a yeast infection, aggravated by a hot, humid climate.

With other types of eczema such as **Discoid Eczema** and **Venous (varicose) Eczema** the cause is not always known. Often an infection is present but the cause can be numerous.

4.3 Pathology

Atopic Eczema

Atopic Eczema can start when a person is an infant but often babies grow out of it after 18 months or more. It affects 15-20% of school children and 2-3% of adults in the UK. 75% are clear by the age of 15.[12]

It is a chronic itchy form and it can affect many areas of the body and even become quite widespread, though how the eczema behaves can vary greatly between sufferers. Common locations of Atopic Eczema are backs of arms, front of legs, faces of children, the inner folds of arms, back of knees and neck folds of adults. In worst case scenarios, it can be so intense that it leads to insomnia, irritability and stress. When the eczema is scratched, it aggravates the rash and creates an itch-scratch-rash cycle that can lead to thickening and roughness of the skin (lichenification), dryness (xerosis) and occasionally secondary infection. Often sufferers will have a family history of asthma, hayfever or allergic rhinitis.[12]

Discoid Eczema

Skin Fact Number Seven: In Greek eczema means to"boil over" and this refers to the weeping stage of acute eczema.

Discoid Eczema has the appearance of discs of red, dry and itchy skin on any part of the body. The discs of Discoid Eczema can vary in size. Crusting on the surface may be apparent as a result of the infection and as it begins to clear, it becomes scaly. The bacteria (which often causes the eczema) secretes a toxin which makes the eczema worse so it's important to eradicate the bacteria to ensure successful treatment. A typical patient would be male of middle age or older and patients can be suffering from chronic stress.

Venous Eczema (Varicose)

Venous Eczema (Varicose) is only found below the knee. Dryness and redness develops on the lower leg. It is itchy and scaly around the ankles. The foot may appear puffy. The eczema can spread to the mid-calf and the vein can appear swollen and blue (indicating an infection). The majority of patients are women of middle age or older. However, the condition can be seen in others who have problems in the leg veins such as varicose veins or deep vein thrombosis.

Skin Fact Number Eight: It should be noted that several other skin conditions could be mistaken for eczema. These include fungal infections (lesions on hands, feet and or groin - often unilateral); psoriasis (see section five); rosacea (seen in middle-aged patients where the skin on the face has dilated capillaries and flushing); scabies (the rash is popular and affects the anterior wrists, palm creases and finger webs).

4.4. Treatment

Symptoms of **Atopic Eczema** can be alleviated with good skin care and lifestyle measures. Emollients with humectants soothe, smooth and hydrate scaly skin and can help it to retain moisture and become soft, smooth and flexible. They can also have a mild anti-inflammatory effect. Large quantities should be prescribed – around 1kg per week for an adult with severe, dry, chronic Atopic Eczema. In addition, topical corticosteroids are often required. Such treatment inhibits the production of inflammatory mediators. The least potent corticosteroid to produce the required effect should be prescribed. As an alternative to corticosteroids, Tacrolimus may be an option. As a common complication of Atopic Eczema is bacterial infection, oral antibiotics are also recommended in short courses. In severe cases, where the skin is lichenfied, bandages containing pastes of zinc oxide or coal tar can be applied over the corticosteroid. Coal Tar is also an option for treatment of severe cases. Plenty of sunshine is often recommended and patients are often referred to their hospital dermatology departments for a course of phototherapy.

Discoid eczema should be treated with a topical steroid of moderate to strong potency. If there is an infection, this should be combined with an antibacterial treatment.

Venous eczema should be treated with emollients and topical steroids. Bandages impregnated with tar can prove effective when used once or twice a week in conjunction with the topical steroids.

4.5 Contact Dermatitis

There are two forms of contact dermatitis. Firstly, there is **Contact Allergic Dermatitis** and secondly there is **Contact Irritant Eczema (Hand Dermatitis)**.

Aetiology

Contact Allergic Dermatitis is triggered by contact with substances that cause an allergic reaction. These are often cobalt, nickel, rubber, fragrances, plants, hair bleaching and perm solutions.

Hand Dermatitis is caused by repeat contact with the same substance such as detergents, shampoos and household cleaning products. Hand Dermatitis is caused by chemical irritation when the chemical comes into contact with the skin. This is the irritant action on the skin and not an allergy.

Seborrhoeic dermatitis

Seborrhoeic dermatitis affects areas where sebaceous glands are particularly active – chest, scalp, eyebrows, behind the ears, sub mammary and groin. It affects men more than women and is usually preceded by dandruff. It manifests as pink/red scaly patches, which is aggravated by a hot, humid climate. Depending on what area of the body is involved, different sets of symptoms can be seen. On the scalp and face, the skin is itchy and scaly and eyelids can become inflamed; on the chest the skin is dry and scaly; on the back red follicular eruptions characterised by papules or pustules appear; and in the groin/sub mammary areas, the rash is pale orange, scaling is light and often accompanied by Candida albicans. Seborrhoic dermatitis can also be found in babies under the age of one and this manifests as a rash on the scalp, eyebrows, skin folds in the face and body, the neck and limbs.

Pathology

Contact Allergic Dermatitis manifests on an area where the skin is in contact with the chemical (e.g. stomach in contact with a belt buckle). The skin becomes red, dry and inflamed. A problem can also arise when a person who suffers with eczema develops an allergy to a cream or ointment that they are using. So called 'eczema medicamentosa ' creams are the most likely to cause this reaction due to the preservatives they contain, and it is well recognised that some steroid molecules can induce contact dermatitis. An allergy to a cream or ointment given for eczema would appear to flare up and sting after treatment.

Hand dermatitis

Hand Dermatitis can look similar to Contact Allergic Dermatitis which can be confusing. However, it is likely that Contact Irritant Eczema (Hand Dermatitis) is on the hands as it is the hands that come into repeat contact with the substance. It is most common on the hands of chefs, caterers, cleaners, hairdressers, surgical nurses and construction workers.

Treatment

Treatment of Contact Allergic Dermatitis involves identifying the cause of the condition so that the patient can avoid contact with, or protect him/herself from the allergen. Topical steroid preparations can be used.

Like Contact Allergic Dermatitis, the most important thing is to identify the cause of Hand Dermatitis so that it can be avoided. Over the counter hydrocortisone can be prescribed. If exposure to the irritant cannot be avoided then the skin should be protected with gloves. Emollients and humectants can offer some relief and prevent the skin from drying out.

Treatment of Seborrhoic dermatitis depends on the severity of the condition. Ketaconazole shampoos and cream can treat mild cases on the scalp. Some cases may also require topical steroid cream / antifungal cream combinations or even a short course of itraconazole.

Exercise 1 & 2

Georgina is a 14 year old girl who has recently developed eczema on her hands and legs. She was prescribed an emollient by her GP. The last prescription was 4 weeks ago.

Georgina's mother comes in with her second prescription and comments that Georgina's eczema started to get better, but after 3 weeks, the rash has come back and now there are bright red pustules on the skin. What would your first questions be?

Georgina's mother tells you that Georgina applies the cream herself. She uses it only at night because she feels embarrassed about having a greasy cream on her skin at school. She is not sure as to whether Georgina still scratches, but she has seen her apply the cream and she does rub it in a circular motion into the patches on her skin. What do you advise next ?

Case Study - Dermatitis

Alison, a 34 year old asthma sufferer woman who has regular prescriptions for Salbutamol, comes to you with a rash on her wrist. She says that it appeared a couple of days go and she is now too uncomfortable to wear a watch.

What are the most likely causes of this rash?

1. Allergic contact dermatitis

Alison's asthma does make her more vulnerable to other presentations of atopy, and a sudden appearance of a red, itchy rash in an area in close contact with a material means that contact dermatitis is the most likely cause. Although this would be more likely if Alison had been wearing a new watch or bracelet, contact dermatitis can be initiated by allergens that the patient has been frequently exposed to.

2. Fungal skin lesion

A skin fungal infection should be ruled out. The warm moist environment that develops between the back of a watch and the wrist creates the ideal conditions for fungal infections. Usually the rash will be more circular and may look healed in the centre. Although it may itch less than a contact dermatitis rash, it may still cause some discomfort.

What is the recommended treatment

If you are sure that the rash is contact dermatitis, treat with 1% hydrocortisone twice daily for up to a week. If you suspect fungal involvement, treat with an antimicotic, advising Alison to keep the area cool and dry and continue using the cream for 5 days after the rash has disappeared. In either case it is important to avoid wearing the watch during treatment, and Alison should be made aware that, particularly in the case of contact dermatitis, the condition may re-occur.

Section 5

Psoriasis

After completing this section you will be able to:

Understand the causes of psoriasis

Identify the different types of psoriasis

Recommend treatment for psoriasis

5.1. Overview

Psoriasis belongs to a group of skin conditions known as papulosquamous disorders. They appear in the form of rashes that are raised, scaly and marginated. Psoriasis is a chronic inflammatory skin disease that affects two to three per cent of the population in the UK.[13] The disease usually starts between the second and third decades of life or in the sixth decade, although it can start at any age. There are two major abnormalities present in psoriasis:

- Hyperproliferation of the epidermis
- Inflammatory cell infiltration

5.2 Aetiology

The exact causes of psoriasis are not known but around one third of people who have psoriasis have another family member with the condition so genes are most likely involved. It is thought that stress can cause psoriasis but this has not been scientifically confirmed. Some people who suffer from psoriasis say that in times of stress, their psoriasis does flare up but it is not the case for everyone. Infections such as streptococcal infections of the throat can trigger guttate psoriasis and having tonsillitis can cause psoriasis to appear.[13] In 10% of psoriasis sufferers sunlight can be a trigger factor.[13] Other climate change can be noticed with psoriasis becoming worse in the autumn and winter. Trauma, drugs and alcohol can also prove to be triggers.[13]


Plaque Psoriasis


Inverse Psoriasis


Erythrodermic Psoriasis


Guttate Psoriasis


Pustular Psoriasis


Flexural Psoriasis


Palmo Plantar Psoriasis

5.3 Pathology

The characteristics of psoriasis are well-demarcated, erythemateous plaques covered with silvery scales. These are often found on the scalp, the outside surfaces of the limbs and the lower back. In around 50 per cent of cases, the fingers and toenails are affected and five to ten per cent of people with psoriasis also have an associated disease of the joint or limbs.[14]

Types of psoriasis include:

Plaque Psoriasis – This is the most common form and accounts for around eighty per cent of cases.[14] The plaques are pink or red with well-defined edges and covered in silvery scales. Ranging in size from a few millimetres to large patches, the plaques are often thick and sometimes itchy. Most common sites are elbows, knees, lower back, shins and scalp.

Inverse Psoriasis – This type of psoriasis first shows up as lesions that are very red and usually lack the scale associated with plaque psoriasis. It is found in the armpits, groin, under the breasts, and in the folds around the genitals and buttocks. It is particularly sensitive to irritation from rubbing and sweating because of its location. It tends to be more common in overweight people and those with deep skin folds.

Erythrodermic Psoriasis – It generally appears on people who have unstable plaque psoriasis, where lesions are not clearly defined and is a particularly inflammatory form of psoriasis. It also appears on people who have used steroids inappropriately both for erythrodermic and pustular psoriasis. The reddening and shedding of the skin are often accompanied by severe itching and pain. This type of psoriasis can affect the body's chemistry, causing protein and fluid loss leading to severe illness. Edema (swelling from fluid retention), especially around the ankles, can occur. Body temperature can be disrupted and infection can occur. Severe cases can be life threatening and people are often hospitalised.

Guttate Psoriasis – Small plaque droplets are found covering the trunk and limbs. Usually affects adolescents or young adults and often follows a bout of streptococcal pharyngitis. The lesions become scaly but clear as time progresses.

Pustular Psoriasis – Primarily seen in adults, this type of psoriasis is characterised by white pustules surrounded by red skin. It is a relatively unusual form and affects fewer than 5% of all people with psoriasis. It can be localised to certain parts of the body such as the hands and feet. At the same time, it can also cover the entire body. It tends to occur in a cycle: reddening of the skin followed by formation of pustules and scaling.

Flexural Psoriasis – This is often found on the sub-mammary, axillary and anogenital folds. There is an absence of scale and satellite legions. The plaques are red and well-defined, and sometimes glistening. Flexural Psoriasis tends to be more common in women and the elderly.

Palmo Plantar Psoriasis – This type looks very different to plaque or flexural psoriasis. It is normally found on the palms of the hands and/or the soles of the feet, and occurs more prominently in female smokers. Unlike plaque psoriasis, there are no red, scaly lesions but instead a mass of weeping, cracked areas which resemble tiny, yellowish blisters. They can be very painful and look 'infected', even though no infection is present.

5.4. Treatment

There is no known cure for psoriasis. However, treatment can sometimes help and will control the condition by clearing or reducing the patches of psoriasis.

Psoriasis tends to come and go so relapses are difficult to predict and cannot be prevented with topical treatment. There are many preparations and treatment combinations which will depend on the severity and the type of psoriasis, whether it is on the scalp or other areas of the body. It usually takes several weeks of treatment to clear plaques and some treatments take longer than others to work.

The majority of patients have mild disease that is manageable. The rest have moderate to severe symptoms that require supervision by a dermatologist. Most patients will receive drug treatments, sometimes combined with phototherapy or photochemotherapy.

Psoriasis can be controlled with emollients, keratolytic agents and Vitamin D analogues. People with psoriasis should be encouraged to use emollients regularly as they can improve the function of the skin by restoring pliability and preventing itching. They also reduce the profuse scaling sufferers often find embarrassing. Sometimes the effectiveness of active treatments can be improved by 'descaling' the plaques using products containing salicylic acid.

For mild psoriasis, treatment with an emollient may be all that is needed. Patients can also use emollients in addition to any other treatment, to keep the skin moist and supple.

Topical steroids may be used on their own or in rotation with other treatments to achieve a more effective result. Face and flexures (under breasts, behind knees/elbows) are treated with a mild steroid (e.g. hydrocortisone 1%). Thicker patches on the scalp, hands and feet are treated with a potent (e.g. betamethasone valerate) or very potent (e.g. clobetasol propionate) steroid as these areas can be more difficult to treat. Sometimes, in cases of more severe psoriasis of flexures, a moderately potent steroid used in combination with an antibiotic and anti-fungal medicine may be used. This is because the psoriasis and surrounding skin may be broken and more susceptible to infection. Various preparations such as lotions, gels, creams and ointments are available to suit the different areas to be treated.

Calcipotriol and tacalcitol belong to a group of medicines known as **Vitamin D analogues** (which are chemically related to vitamin A). Calcipotriol is available as a cream or ointment to treat plaque psoriasis and as a lotion for scalp psoriasis. It is also available in combination with betamethasone, a potent topical steroid. Tacalcitol is available as an ointment to treat plaque psoriasis. Calcitriol is a form of Vitamin D and is available as an ointment for the treatment of mild to moderate plaque psoriasis. These are effective treatments and usually well tolerated but sometimes cause irritation. These preparations do not smell or stain. Some people find that after several weeks, the treatment is not as effective. It may be helpful to alternate with another treatment every few weeks.

Dithranol is sometimes used in combination with salicylic acid, coal tar or with hospital based treatments such as UV irradiation (particularly UVB). Dithranol is only used on areas affected by psoriasis because it is an irritant. You can protect the surrounding normal skin with yellow or white soft paraffin. To avoid irritation, dithranol treatment normally begins with the lowest strength, which is gradually increased if necessary. Patients sometimes find that this treatment results in stains on their clothing and on the bath.

Coal tar helps to reduce inflammation and also helps to remove loose scales from the patches of psoriasis. Coal tar can be applied to or allowed to come into contact with normal skin. Some tar products can be used on the face and in the flexures (behind elbows/knees and on the shins). Tar baths and shampoos can also be helpful although can smell unpleasant. Higher strengths of coal tar may be needed to treat the thicker patches of psoriasis.

Tazarotene is a retinoid (a substance chemically similar to vitamin A). It is available as an ointment. It does not smell or stain. It is only used on areas affected by psoriasis and not on normal skin and it can cause irritation. You can protect the surrounding normal skin with yellow or white soft paraffin.

Other topical treatments Salicylic acid is known as a keratolytic agent. This means that it softens the scaly layers of the psoriasis plaques and eases their removal. It is often combined with other treatments such as coal tar and/or dithranol in ointments and scalp applications. Coconut oil helps to soften the psoriasis plaques. It is used in combination with salicylic acid and coal tar for treatment of scalp psoriasis.

Hospital based treatments Patients may need to be referred to a dermatologist if their psoriasis is severe or resistant to treatment. Preparations that have been used previously may be applied at different strengths, with various dressings or alternative methods of application and combinations. These treatments may also be used in combination with systemic treatments (treatments taken by mouth), with phototherapy (light treatment) or with photochemotherapy (light treatment plus psoralen).

Skin Fact Number Nine: Around one third of patients have a family history of psoriasis. If one parent is known to suffer, the child has a twenty five per cent chance of developing psoriasis. If both parents are affected, the child has a thirty per cent chance.[13]

Exercise 1

Psoriasis Case Study

Tim is a 25 year old man who developed psoriasis as a child. He has patches on his elbows, kneecaps and lower back that have been kept successfully under control with calcipotriol Cream (120g per month), and scalp lesions that have been well controlled with Alphosyl shampoo.

His psoriasis has been getting worse now for a couple of months and the calcipotriol is no longer controlling his symptoms. The patches have now spread to his thighs and upper arms, and his scalp patches now extend to his forehead and onto one of his cheeks. His GP has increased the amount of cream he has given Tim to 4 x 60g tubes and asked him to apply it more frequently (three times a day). He has asked Tim to return in a month. What would you ask Tim and how would you comment on the recommendations?

Tim tells you that he usually uses the cream only once a day and will take your advice and increase it to two. He doesn't take any other routine medication, but he has just returned from Africa and is finishing his anti-malarials. He comments that he is particularly disappointed, because the sun very often makes his condition better rather than worse. Any comments?

Section 6

Multiple Choice Questions

These multiple choice questions will help you to consolidate what you have learned when studying the Skin Health Pack

Multiple Choice Questions

1. What percentage of body weight does the skin account for?
   a) 12 per cent ☐
   b) 20 per cent ☐
   c) 16 per cent ☐

2. What are Langerhan's Cells?
   a) Cells that make melatonin
   b) Cells that produce regulatory proteins
   c) Cells that play a significant part in the skin's immune system

3. How many layers does the epidermis contain?
   a) Three ☐
   b) Four ☐
   c) Thirteen ☐

4. The Stratum Corneum is a well-ordered layer that serves as the primary defence against environmental insult and is the barrier to subcutaneous absorption.
   True ☐ False ☐

5. The lamellar lipid layer restricts transepidermal water loss
   True ☐ False ☐

6. Where are the sweat glands found?
   a) Dermis ☐
   b) Epidermis ☐
   c) Subcutis ☐

7. What is the primary component of the dermis?
   a) Smooth muscle
   b) Long chain ceramides
   c) Collagen

8. The process of Transepidermal Water Loss is:
   a) Movement of water between the dermis and epidermis ☐
   b) The natural rate of water loss regulated by the stratum corneum ☐
   c) Neither of the above ☐

9. Normal healthy skin loses half a pint of water into the atmosphere every day.
   True ☐ False ☐

10. When the desquamation process doesn't function properly, dead skin cells collect on your skin and become visible as dry skin flakes.
    True ☐ False ☐

11. Using the Kligman's criteria, skin with moderate xerosis, some dry flakes and a powdery appearance would be:
    a) Grade 4 ☐
    b) Grade 2 ☐
    c) Grade 3 ☐

12. Humectants attract water from the deeper layers of the skin and therefore have a profound moisturising effect.
    True ☐ False ☐

13. Moisturisers that contain a blend of humectants, occlusives and emollients are more effective than moisturisers containing just one of these ingredients.
    True ☐ False ☐

14. Emollients trap water in the skin (occlusion) and prevent further water loss.
    True ☐ False ☐

15. Humectants do not help the visual qualities of skin.
    True ☐ False ☐

16. Glycerol is one of the most commonly used emollients.

True ☐ False ☐

17. Dimethicone is is an effective emollient that adds a palatable slip to moisturisers.

True ☐ False ☐

18. Seborrhoeic eczema is the most common form of eczema.

True ☐ False ☐

19. Atopic eczema is thought to be caused by a yeast infection.

True ☐ False ☐

20. Lichenification is a feature of chronic eczema.

True ☐ False ☐

21. How much humectants and emollients should be prescribed each week for an adult suffering from severe, dry, chronic atopic eczema?

a) 2Kg ☐
b) 1Kg ☐
c) 500g ☐

22. Anti-fungal shampoos can treat seborrhoeic eczema that appears on the scalp.

True ☐ False ☐

23. Hand dermatitis is caused by an allergy.

True ☐ False ☐

24. Psoriasis affects 2-3% of the population in the UK

True ☐ False ☐

25. Which is the most common form of psoriasis?
    a) Flexural ☐
    b) Guttate ☐
    c) Plaque ☐

26. People with psoriasis should be encourage to use emollients regularly to improve the function of the skin and reduce scaling.

    True ☐ False ☐

Section 7
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Section 8

Further Reading

Further Information

www.keepingskinamazing.co.uk

www.eczema.org

www.psoriaisis-help.org.uk

www.dermatology.co.uk

www.patient.co.uk

If you have any comments or feedback on this or any other resources on www.keepingskinamazing.co.uk, please do email us on Vaseline@uk.cohnwolfe.com or telephone 0207 331 5434.