

The Integumentary System

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As with other units, it is important to use the activities in this unit as a basis for discussion and conversation. You are encouraged to work with your colleagues on aspects of the unit.

Note on vocabulary: Throughout the unit, useful vocabulary words, both technical and non-technical have been placed in **BOLD** print. As you work through the unit, make sure that you take time to look-up or, better yet, discuss with a colleague the meaning of these terms.

Reading

Instructions: Read the text passage below. Special vocabulary terms are shown in bold print. Use a medical dictionary or the internet to look up any technical terms that are new to you. As you read the text, try to match the descriptions with the figure.

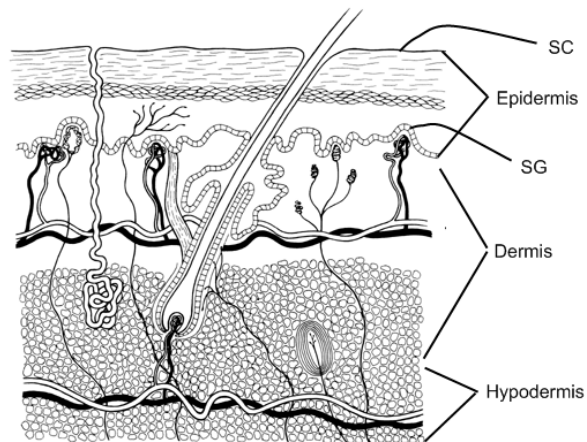
The integument provides the following functions: (1) physical protection from chemicals and **abrasives**, (2) excretion (in the form of secretion of sweat and oils), (3) nutrition (synthesis of vitamin D₃), (4) thermoregulation, (5) reception of sensory information from the environment and, (6) it **participates** in immune protection in cases where the integument has been broken and the underlying tissue has been **exposed to** microorganisms.

The integument **consists** of two parts, (i) the cutaneous membrane (the skin) and (ii) accessory structures (hair follicles, nails, exocrine glands, ect.). The cutaneous membrane is **composed** of two **layers**; the **superficial** (outer) **avascular** layer is called the **epidermis**, while the **deep** (inner) **vascular** layer is called the **dermis**.

The epidermis is formed from keratinized stratified squamous epithelial tissue. Depending on its location on the body surface, the epidermis is composed of either 4 or 5 strata of epithelial cells. However, **regardless** of location, the superficial strata (**stratum corneum {SC}**) consist of 20 to 30 layers of dead cells containing large amounts of the protein keratin. Keratin provides weatherproofing for the skin and also provides part of the physical **barrier** that protects the underlying tissue. Where the stratum corneum is exposed to excessive stress it thickens and the thickened area is called a **callus**. The epidermis is continually **renewed** through division of cells found in the deepest stratum (**stratum germinativum {SG}**). The deepest stratum also contains melanocytes. These cells **manufacture** the pigment melanin, which gives skin its **range** of colors. The melanin also helps protect the skin against UV radiation. Melanocytes {cyte = cell} respond to increased UV radiation by manufacturing more melanin. As a result the skin **darkens** when exposed to sunlight for **extended** periods of time. The number of melanocytes **varies** little from person to person. Differences in skin color are **mainly** due to the genetically predetermined amount of melanin produced by each person.

The deep layer of the skin, the dermis, is composed of connective tissue with an abundance of collagen fibers and elastic fibers. The connective tissue of the dermis is very vascular and contains a variety of **nerve fibers (both sensory and motor)**. These nerve endings include, pain, light touch, pressure, heat and cold receptors. Except for **hairs and nails**, which project above the surface of the epidermis, the other accessory structures are located within the dermis.

The accessory structures of the integument (**hair follicles** and **nails**) grow in **cycles**. In many animals, hair **plays a part** in thermoregulation, however, in humans the **role** of hair has been reduced to mainly protecting the entrance to the nose from airborne debris and protecting the head from UV radiation. Small muscles, located in the dermis, attach to hair follicles and when they contract they can change the position of the hair. These muscles are called **arrector pili muscles**, which are supplied by motor nerve fibers of the **parasympathetic nervous system (PNS)**, and their effect can be easily seen when the hair on the back of dogs is “raised” as a sign of aggression. These muscles are present in humans but hair density is too low to produce a noticeable effect. However, the effect can be seen on the skin of the arms and legs in cold weather. When these muscles contract, as part of the thermoregulation response, they produce a small



bump on the skin next to each hair. These little bumps can be seen and felt and are called “goose pimples” or “goose flesh.”

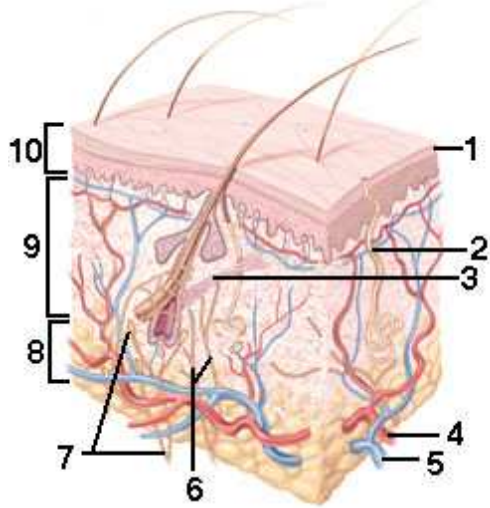
Nails play a role in stabilizing the tips of the digits during mechanical stress. The exocrine glands found in the skin produce secretions on a **continuous** basis. The **exocrine glands** can be divided into **sebaceous** glands (oil glands) and **sweat** glands. These glands differ from each other in both the **nature** and mechanism of their secretions. Sebaceous glands help water proof the skin as well as keep it soft and subtle. The lipids in the secretions may also have antibacterial properties. Secretions from sweat glands play a role in thermoregulation. Water produced by these glands is evaporated from the skin thereby reducing the heat content of the body.

Unlike the epidermis, the dermis is vascular and has a rich network of arteries, veins and capillaries that supply oxygen and nutrients to the structures and tissues of both the dermis and the epidermis. The main tissue in the dermis is dense irregular connective tissue.

The layer below the dermis is called the hypodermis or subcutaneous layer. Like the dermis, the hypodermis is vascular and consists of a combination of dense irregular connective tissue and adipose tissue.

Check Point (1) – Anatomy Review

Instructions: work with a partner and name the numbered items in the diagram.

Skin Anatomy	
hypodermis, stratum corneum, nerve fiber, sweat gland, epidermis, sensory receptor, vein, arrector pili muscle, artery, dermis	
1. _____	
2. _____	
3. _____	
4. _____	
5. _____	
6. _____	
7. _____	
8. _____	
9. _____	
10. _____	

Reading

Medication Delivery and Skin

The subcutaneous layer (hypodermis), which is deep to the dermis, is not technically part of the skin. The subcutaneous layer consists of connective tissue, mostly adipose tissue, and **anchors** the dermis to the fascia of the muscles. The subcutaneous layer is a **frequent** site for injection of medications (hypodermic or subcutaneous injections). Injections that go deeper are called intramuscular injections (IM), while those that are injected directly into the blood are called intravenous injections (IV). Insulin (hormone), warfarin (anticoagulant), epinephrine (hormone), interferon (antiviral agent), and promethazine (antiemetic agent) are examples of medicines that are injected subcutaneously. The subcutaneous region is **highly** vascular and medications injected into this tissue are absorbed easily into the blood. The **loose** nature of the tissue also allows for a **considerable** volume to be injected with little **discomfort**. The subcutaneous layer is perfect for drugs that are absorbed too slowly from IM injections, and too fast from IV injections or drugs that are destroyed by the gastric secretions of the stomach.

A new form of drug administration uses medicines that can absorb through the **entire** thickness of the epidermis. The drugs are placed on a patch which is **stuck** to the skin with an **adhesive**. The drug then diffuses across the epidermis and into the dermis. From the dermis the medicine diffuses into the blood and is carried to the target tissue(s). This form of drug administration is called transdermal administration. And the adhesive containing the medicine is sometimes referred to as a “**patch**.” Nicotine replacement therapy and some contraceptive medicines use this drug **delivery** mechanism.

Vocabulary

Technical Vocabulary	Pharmacological Vocabulary	Specialized Vocabulary
Superficial	Insulin	Patch
Deep	Warfarin	Lumpy
Epidermis	Anticoagulant	Dimpled (appearance)
Dermis	Antiemetic	Stuck
Hypodermis	Epinephrine	Entire
Subcutaneous layer	Promethazine	Adhesive
Sebaceous gland	Interferon	Discomfort
Sweat gland		Continuous
Adipose tissue		Range
Stratum corneum		Darken
Stratum germinativum		Considerable
Dense irregular connective tissue		Abrasive
Keratin		
Keratinized		
Melanin		
Arrector pili muscle		
Hair follicle		
Vascular		
Avascular		
Exocrine gland		
Cellulitis		
Cellulite		
Intramuscular injection		
Intravenous injection		
Transdermal delivery		
Nerve fiber		

Check Point (2) – Vocabulary

Instructions: Work with a partner and combine the words in column A with as many words as possible in Column B to make meaningful phrases. Use the spaces provided to write the words or phrases you create.

A	B
1. Accessory	A. Barrier
2. Blood	B. Invader
3. Connective	C. Determined
4. Deep	D. Discomfort
5. Delivery	E. Ending
6. Epithelial	F. Gland
7. Exocrine	G. Injection
8. Genetically	H. Layer
9. Highly	I. Mechanism
10. Hypodermic	J. Medication
11. Intramuscular	K. Pigment
12. Intravenous	L. Radiation
13. Microbial	M. Structures
14. Mild	N. Tissue
15. Nerve	O. Vascular
16. Physical	P. Vessel
17. Sebaceous	
18. Subcutaneous	
19. Superficial	
20. Sweat	
21. Skin	
22. UV	
23. Transdermal	

1. _____	13. _____	25. _____
2. _____	14. _____	26. _____
3. _____	15. _____	27. _____
4. _____	16. _____	28. _____
5. _____	17. _____	29. _____
6. _____	18. _____	30. _____
7. _____	19. _____	31. _____
8. _____	20. _____	32. _____
9. _____	21. _____	33. _____
10. _____	22. _____	34. _____
11. _____	23. _____	35. _____
12. _____	24. _____	

Check Point (3) – Vocabulary

Instructions: Work with a partner and match the words in column A with a suitable definition from column B.

A	B
1. Abrasives	A. Changes or differs
2. Participates	B. Having or showing no concern for relevance
3. Invaded	C. Made up of many things
4. Consists of	D. Oscillation of movement
5. Composed	E. Something that is rough in texture
6. Layers	F. Stratum
7. Regardless	G. To a large extent or importantly
8. Renewed	H. To form again
9. Manufacture	I. Calm
10. Range	J. To enter without an invitation
11. Darkens	K. To increase or stretch out
12. Extended	L. To make less pale
13. Varies	M. To make or produce
14. Mainly	N. To take part in an activity
15. Cycles	O. Variety
16. Play a part	P. A lot or a great deal of something
17. Role	Q. A small piece of material used to cover or protect something or some area.
18. Continuous	R. A sticky substance
19. Nature	S. Complete
20. Frequent	T. Mild pain
21. Anchors	U. Often
22. Highly	V. Relationship suggesting freedom of movement
23. Loose	W. The function of something or someone
24. Considerable	X. To attached something to something else
25. Discomfort	Y. To bring or take something somewhere
26. Entire	Z. To fasten into position
27. Stick	AA. To take part in something
28. Adhesive	BB. Very
29. Patch	CC. What something is
30. Deliver	DD. Without stopping and starting

Reading

The skin is the largest organ in the body in terms of surface area. It is also the organ in most intimate contact with the environment. It comes in contact with hot water, cold water, strong chemicals, soaps, shampoos, **creams**, cosmetics, and **lotions**. It is also exposed to sunlight, freezing temperatures, burns, cuts, **scrapes** and **abrasions**. Throughout it all, the skin generally remains healthy and intact. However, the skin is subject to a variety of problems, ranging from the inconvenient to the serious and life threatening. Viruses, bacteria, fungi and multi-cellular parasites can attack and damage the skin and at times, the body's own immune system can attack the skin with devastating results.

Clinical Corner

Acne: Inflammation of the sebaceous glands caused by an accumulation of secretions. The condition is often linked to *Propionibacterium acnes* and in severe cases can be treated with antibiotics.

Athlete's foot (Tinea pedis): A fungal skin infection, usually of the feet, which causes **peeling** and **cracking** of the skin between the toes. The most common cause is *Trichophyton rubrum*.

Cellulite: A skin condition of the lower limbs, buttocks and abdomen in which the skin appears dimpled. The dimpling is caused by the arrangement (more common in women) of fibers that connect muscle sheaths to the skin. The irregular arrangement allows fat to bulge between the fibers producing a rippled appearance on the surface of the skin. It is generally unrelated or only loosely related to obesity. Cellulite is unrelated to cellulitis which is an inflammation of the connective tissue of the dermis and hypodermis.

Chicken pox: A viral (herpes varicella) childhood disease that is spread, primarily, via the respiratory system. The condition manifests itself as red itchy **papules** which appear 2 to 4 days after infection and **persist** for about 14 days. A vaccine is available. The vaccine is a **live attenuated virus** and is usually given on the same schedule as the **MMR vaccine**.

Cold sores (fever blisters): A viral condition (Herpes simplex 1 – HSV-1) that causes **lesions** around the mouth and lips and on the face. Lesions **heal** in 1 to 3 weeks without any treatment. However, this a **reservoir** disease and the lesions can return latter in life. **Acyclovir** has been shown to be effective in treating herpes infections and can reduce the amount of time healing. In some situations, the drug can be used **prophylactically** to prevent future **reoccurrences**.

Decubitis ulcer (bed or pressure sores): Lesions which develop where pressure has reduced circulation to the tissues of the skin. Patients who are **bedridden** can develop these lesions in areas where the skin is compressed between **bony prominences** (**coccyx**, **calcaneal** regions, **olecranon** regions, **scapular** regions) and the mattress. Prevention is usually just a matter of turning the patient frequently. However, when these sore develop they can be very serious because they are frequently infected by anaerobic bacteria. Christopher Reeve (1952 – 2004) known for is movie role as Superman, was paralyzed in an equestrian accident in 1995. His neck was broken and he live on a respirator for 9 years, but ultimately died from septicemia related to a decubitis ulcer.

Dermatitis: Inflammation of the layer of skin just below the epidermis. This area is known as the **papillary region** of the dermis. There are many possible causes of dermatitis, including allergies and chemicals. Symptoms include itchy, red rashes.

Eczema (atopic): Allergic dermatitis. This type of dermatitis is an allergic reaction to an environmental stimulus. Generally there is a **familial history** which supports this diagnosis.

Erysipela: An acute bacterial (staphylococcus pyogenes) infection of the dermis and hypodermis. The condition is most common in the old and in children. The bacteria often enter the skin through small wounds. Symptoms include fever, chills, headaches and vomiting. Treatment consists of either oral or IV antibiotics.

Freckle: Small patches of skin with increased pigmentation.

Impetigo: A bacterial infection of the skin caused by *Streptococcus pyogenes*. The condition is most common in children and is often associated with insect bites and small skin traumas. Treatment usually consists of either **topical** or oral antibiotics.

-itis: Suffix that means inflammation. This suffix is added to words to indicate an inflammation of that organ, tissue or structure, i.e. dermatitis.

Malignant melanoma: A skin cancer of the pigment producing cells of the skin, the **melanocytes**. While a **rare** form of cancer, it accounts for most skin cancer deaths. If not discovered early, there is poor **prognosis** for a **cure**.

Mole: A congenital spot on the skin (nevus).

Psoriasis: Thought to be an **immune**-related disease, it is characterized by inflammation, redness and excessive **proliferation** of the skin in the involved areas. The skin over the elbows and knees are common locations where the condition is seen. Treatments generally target the inflammation and seek **symptomatic relief**.

Ringworm: A common, nonspecific name to fungal infections causes by species in the *Trichophyton* and *Microsporum* families. (See Athlete's foot above.)

Rubella (German measles): A viral infection usually spread by the respiratory system. Symptoms include a **fever** and skin rash. In children the symptoms are usually mild and recovery is rapid and complete. However, the disease can cause serious **birth defects** when a woman becomes infected

with the virus during pregnancy. The virus can cross the **placenta** and infect the developing **fetus** causing great harm. The vaccine for this virus is normally included in the MMR vaccine, with the "R" standing for Rubella.

Rubeola (red measles): A highly **contagious** viral infection affecting mainly children. Even though Rubeola is called measles, it is a much more serious disease than rubella. The fever, rash and respiratory symptoms are much more **pronounced** and bacterial respiratory complications are frequently seen. The MMR vaccine **immunizes** against this disease. The first "M" stands for measles. The second "M" stands for mumps.

Sepsis: A serious condition caused by the body's immune response to a severe bacterial infection. This is a frequent complication in patients who have been badly burned and large areas of underlying tissue have become infected. Common organisms responsible for these severe infections include *Pseudomonas aeruginosa* and *Staphylococcus aureus*.

Shingles: A skin condition that results from a reactivation of the **latent** virus which had previously caused chicken pox during the patient's youth. Chicken pox is caused by a member of the herpes family of viruses. These viruses remain in the body in a latent form long after the original disease is over. When the virus comes out of latency, it produces a series of **papules** that follow the path of sensory neurons which loop from the back around the abdomen. The lesions are extremely painful and take weeks to resolve. Treatment is directed at the virus with drugs such as acyclovir, at the pain with painkillers and at the inflammation with **corticosteroids**. Shingles is not contagious, however, the lesions can cause chicken pox in persons who have not previously had the chicken pox or have not been vaccinated against the chicken pox.

Urticaria (hives): An allergic skin response to contact or ingestion of the offending **allergen**. The skin response usually takes the form of raised **wheals** or **welts** and can last from a few hours to weeks. The local **edema** results from vaso-active substances released from **mast** cells as part of the immune response to the allergen.

Wart: A small elevation of the skin which is frequently caused by the papomavirus.

Xerosis (dry skin): A mild condition that is usually treated **symptomatically**. Underlying conditions include **dehydration** (particularly in the elderly), vitamin deficiencies and diabetes. The dry skin is often very itchy.

Check Point (4) -- Skin Conditions and Diseases

Instructions: work with a partner and match the disease or skin condition in column B with the description in column A. As you work with your partner on this exercise, try to define the words in bold print.

A	B
1. An itchy rash caused when the skin comes into contact with a strong chemical irritant.	A. Acne
2. A skin lesion that occurs in areas that have restricted circulation. Sometimes called a "bed sore."	B. Blister
3. Inflammation of the dermis.	C. Chicken pox
4. Inflammation of the dermis associated with contact with urine and feces in babies.	D. Cold sores
5. Inflammation of the dermis that has a strong genetic component and can be triggered by stress as well as chemical irritants.	E. Contact dermatitis
6. Lesions that form on or near the lips associated with HS1 infections or flare-ups.	F. Decubitus ulcer
7. Needle used to inject medicine into the subcutaneous region.	G. Dermatitis
8. Skin cancer originating in melanocytes.	H. Diaper rash
9. Dry skin. (common in older people)	I. Eczema
10. An inflammation of the dermis in response to allergic reaction to food, insects, stress or other factors.	J. Erysipelas
11. Rapid skin growth that produces patches of dry scaly skin.	K. Graft
12. Skin transplanted to aid in the healing of an extensively injured area of skin. Such injuries might come from 3 rd degree burns.	L. Hypodermic needle
13. A generalized bacterial infection. This type of infection is a leading cause of death in burn patients because the loss of the epidermis and dermis compromises the body's microbial barrier.	M. Malignant melanoma
14. A small itchy, swelling resulting from an inflammatory response to something like a mosquito bite. Sometime called a welt.	N. Psoriasis
15. Characterized by small, painful, itchy, red vesicles. A common childhood disease caused by a virus in the Herpesvirus group.	O. Scar
16. Painful lesions (associated with sensory neurons) that occur about the trunk in elderly people who have been under immunological stress.	P. Sepsis
17. Mild but painful inflammation of the skin associated with over exposure to sunlight.	Q. Shingles
18. A change in the appearance of the skin that persists after a burn or lesion has healed .	R. Sunburn
19. A localized bacterial infection of the skin that extends into the subcutaneous layer.	S. Urticaria
20. An inflammatory disease of the sebaceous glands (commonly of the face) resulting in the formation of pus filled vesicles called pimples .	T. Wheal
21. A vesicle on the skin containing serum resulting from a burn or friction injury.	U. Xerosis

Check Point (5) – Medical phrases

Instructions: work with a partner and make as many meaningful phrases as you can by combining words in column A with words in column B. Words in column B can be used more than once.

A	B
1. allergic	A. anesthetic
2. bacterial	B. blood flow
3. chemical	C. burn(s)
4. chicken	D. cancer
5. childhood	E. condition
6. contact	F. dermatitis
7. decubitis	G. disease
8. diaper	H. infection
9. dry	I. irritant
10. extensive	J. lesion
11. full thickness	K. needle
12. hypodermic	L. painful
13. inflammatory	M. pox
14. itchy	N. rash
15. local	O. reaction
16. malignant	P. response
17. mildly	Q. skin
18. pus filled	R. ulcer
19. restricted	S. vesicle
20. skin	
21. sun	
22. third degree	
23. topical	
24. viral	

Talking with the Patient

Instructions: work with a partner and read through the patient / doctor dialog. One person can read the part of the doctor and the other can read the part of the patient. Observe the form and intent of the questions asked by the doctor. Consider the particular words used to question the patient about their medical history.

1. D: Hello Mr. Waters, how can I help you today?
2. P: Hi Doctor, well, I have developed a series of sores along the right side of my abdomen.
3. D: When did you first notice the sores?
4. P: About 7 days ago.
5. D: Did the sores develop slowly or quickly?
6. P: They appeared quickly, over 24 hours or so.
7. D: Well, let's take a look. You don't need to take your shirt off, just raise it high enough for me to see the sores.
8. P: Okay.
9. D: You're right; you have got quite a collection of sores there.
10. D: Well, before we go further I would like to ask you some general questions about your health.
11. P: Okay.
12. D: Do you have any other lesions or sores on your skin besides the ones you've showed me?
13. P: No.
14. D: Have you noticed any rashes on your skin?
15. P: No.
16. D: Have you noticed any changes in the appearance of any of the moles or pigmented areas of your skin?
17. P: No.
18. D: Have you noticed any changes in the texture or moisture content of your skin? Do you have any dry or scaly patches?
19. P: No.
20. D: Have you noticed any changes in sensitivity of your skin? Are there any areas of skin that feel itchy or painful?
21. P: Well, only in the general area where I have the sores now.
22. D: Do you have any skin allergies – any food, pollen, animal, chemical or medicine which in the past has affected your skin or general health?
23. P: No.
24. D: Okay. Have you started taking any new medications lately?
25. P: Yes. Dr. Jones recently changed my blood pressure medication.
26. D: How recently was that?
27. P: Three weeks ago.
28. D: Okay; any other new medications?
29. P: No.
30. D: Could you quickly list the medicine you're taking?
31. P: Sure. I'm now taking Micardis Plus for blood pressure and Sortis for my high cholesterol. Oh, and I also take 80 mg of aspirin every day.
32. D; Okay; thanks.
33. D: Do you have any other chronic conditions besides high blood pressure and high cholesterol?
34. P: No.
35. D: Okay. Now; have you had any recent illnesses – things like a cold or flu?
36. P: No.
37. D: Are you under any additional stress; either at home or at work?
38. P: Well, yes. My brother was recently diagnosed with cancer and is seriously ill and in the hospital. I've been trying to spend as much time as possible with him and I've also been trying to help is wife manage their financial affairs. I don't think I've had a good nights sleep in a month.
39. D: I'm sorry to hear about your brother. I think it's likely that this new stress in your life might be the cause of the sores on your side. It might also be the reason your blood pressure medications had to be changed. Did you tell Dr. Jones about your brother's condition?
40. P: Yes.
41. D: One last question; do you recall if you had chicken pox when you were a child? It was a common childhood illness in many people your age.
42. P: Yes. My mother told me I had a pretty bad case of it when I was five. She said I

was covered from head to toe with those itchy little bumps. Do I have chick pox again?

43. D: Before I explain about the chicken pox, let me ask you if you had any other childhood diseases.

44. P: Well, I also had the red measles. I had strep throat on one or two occasions and I had tonsillitis at least once a year until I was 13 or 14.

45. D: Well, that sounds fairly typical and not out of the ordinary.

46. D: So getting back to the chicken pox; once infected with the virus that causes chicken pox we carry it for the rest of our lives. Normally our immune system keeps the virus under control and we never have any problems with it. However, if our immune system is compromised, it can allow the virus to reactivate. When it does, the lesions or sores tend to follow the path of neurons the loop around the trunk. As you are well aware, the sores can be extremely painful and are easily infected. In your case, I think the terrible stress caused by your brother's conditions has weakened your immune system and allowed the virus to reactivate.

47. P: How long will it take for them to go away?

48. D: They heal slowly, so you are looking at probably 3 to 5 weeks.

49. P: Will they come back again?

50. D: They can, however you may never have this problem again. A lot depends on the health of your immune system.

51. D: I'm going to prescribe an antiviral drug to slow the replication of the virus, antibacterial anesthetic cream to apply to the sores and some painkillers to relieve the pain of the sores. But I also want to get your immune system health up to speed. I am going to give you some medication to relieve some of the anxiety your feeling and a medication to help you sleep better at night. I also want you to start taking a multivitamin every day.

52. D: The medicines I'm giving you are strong – you should not use alcohol again until this problem is resolved and you stop taking the medications. Additionally, alcohol will further weaken your immune system and adversely affect your sleep and, under the circumstances, it could lead to increased depression. So I want you teetotal for now.

53. D: I would like to see you again in three weeks just to make sure the sores are healing properly.

54. P: Okay. Thanks for everything; I'll see you in 3 weeks.

55. D: The pharmacist will go over precautions regarding the use of the medications, but I want to warn you also. The painkillers, the anti-anxiety drug and the sleeping pills will affect your ability to drive. So avoid taking these at times when you need to drive.

56. P: Okay. Thanks for the heads-up.

57. D: Bye. Call me if you have any complications.

Talking with the Patient

Instructions: work with a partner, review the dialog and identify the line numbers corresponding to the following:

Interview element	Line numbers
Patient greeting	
Request for information about the chief complaint	
Request for information related to the chief complaint	
Request for information related to onset of problem	
Request for information related to medications	
Request for information regarding medical history	
Request for information regarding allergies	
Request for information related to childhood diseases	
Request for information related to recent health	
Request for information related to patients personal life	
Statements providing patient education about their condition	
Statements regarding patients prognosis	
Statements describing the doctors plan of action	
Statements of warning and contraindications	
Request to for next appointment to see the patient	
Conclusion of patient visit	

Asking Questions and Giving Answers

Practice asking and answering the following:	Formulate questions for the following answers:
<ol style="list-style-type: none"> 1. What was the patients' chief complaint? 2. What did the problem start? 3. What medication changes did the patient report? 4. What medications is the patient currently taking? 5. What current health problems does the patient have? 6. What childhood diseases did the patient report? 7. Who treats the patients' cardiovascular problems? 8. What is the problem with the patients' brother? 	<ol style="list-style-type: none"> 1. Seven days ago. 2. Along the right side of my abdomen. 3. I had a bad case of it when I was five. 4. It will take 3 to 5 weeks. 5. I have high blood pressure and high cholesterol. 6. I had strep throat, measles and tonsillitis. 7. They can, a lot depends on the health of your immune system.

Talking with the Patient

Instructions: Prior to this activity, students should use the internet or a drug reference book to learn about the medications in the patient profiles below. {http://www.pdrhealth.com/drug_info/}

Instructions: Work with a partner. Create a new interview using the dialog above as a template and patient profiles below. Use the table above as a quick guide for the types of questions to ask as part of the interview. Try to make the interview as conversational as possible. Try to use some of the conversational words and phrases found in the dialog. Reverse doctor / patient roles and create a new interview using Patient B's profile below.

Patient A profile:	Patient B profile:
<p>Age: 75 years old Sex: female Ht: 168 cm, Wt: 82 kg Condition: Xerosis Symptoms: Dry, itchy skin that keeps the patient from sleeping at night. Patient describes the itching as intolerable. Current medical problems: asthma (since 4 yo), type 2 diabetes (10 years) and lupus (30 years). Medications: metformin, oral prednisone, and formoterol fumarate. Childhood illnesses: chicken pox, asthma, measles, and strep throat.</p>	<p>Age: 68 years old Sex: male Ht: 182 cm, Wt. 91 kg Condition: chemical contact dermatitis. Symptoms: burning, itchy skin on the hands and forearms, small fluid filled blisters are visible Onset: Overnight Duration: 4 days Current medical problems: high blood pressure (20 years), migraines (25 years), and prostate hypertrophy (5 years). Medications: telmisartan, Imitrex, and Propecia. Childhood illness: measles, multiple cases of tonsillitis.</p>

Check Point (6) – Prepositions

Instructions: Use the prepositions listed at the top of the table to complete the sentences. Some prepositions can be used more than once.

off, on, for, in, to, with, of, at

1. Please take _____ your shirt so I can examine the skin _____ your back.
2. Can you lay down _____ the examination table _____ me?
3. Is the skin _____ this area painful _____ touch?
4. Have you noticed any change _____ the color _____ the mole _____ your arm?
5. You will need _____ apply this cream _____ the infected area every 4 hours.
6. I want you to add this powder _____ your bath water and then soak _____ the bath tub _____ 20 minutes.
7. I want you _____ apply this topical corticosteroid cream _____ the area of the lesion 3 times a day _____ 2 weeks.
8. Please take this medicine _____ a full glass _____ water.
9. Please have a seat _____ the waiting room. I'll be _____ you _____ about 5 minutes.
10. I would like to check _____ your progress _____ the 4th _____ May. Can you come _____ 9:30 AM?
11. I want you _____ take this medication 4 times a day _____ 3 days. Then take it once _____ the morning and once _____ night _____ 3 more days. And finally, take it only _____ the morning for the last 3 days.

Cross Word Puzzle

Instructions: work with a partner to complete the crossword puzzle using the vocabulary from this unit.



Across	Down
5. without a blood supply	1. system that protects the body from bacterial and viral pathogens
9. deep layer of the skin	2. a technical word for a skin sore or wound
10. inflammation of the deep layer of the skin	3. Type of ulcer linked to pressure or bed sores.
11. pigment that gives color to the skin	4. chicken pox
12. something you do when you itch	6. common inflammatory skin condition in teenagers
14. a transplanted tissue	7. protein that waterproofs the skin
15. superficial layer of the skin	8. also called hives
16. long term condition	12. gland that produces oil secretions
	13. another name for the subcutaneous region

Check Point (7) -- Talking about drugs – Extra for Experts (English names for common drugs)

Instructions: Use the words in the box below to fill in the blanks in the sentences. You may need to use a medical dictionary or the internet. Notice the **bold** collocations.

Anticoagulant	Insulin	Propecia
Antiemetic	Interferon	telmisartan
Epinephrine	metformin	Warfarin
formoterol fumarate	oral prednisone	
Imitrex	Promethazine	

1. The patient required daily **injections of** _____ as treatment for their type 1 diabetes.
2. To prevent blood clots from forming in the circulation, the patient received low doses of _____ as a preventive measure.
3. The virus was causing repeated vomiting so the patient was **treated with an** _____.
4. In cases of anaphylactic shock, _____ is an effective and powerful drug.
5. Nausea was preventing the patient from eating or drinking, so _____ was prescribed to be taken every 8 hours.
6. Hepatitis C is a viral condition which frequently requires **injections of** _____ as part of a treatment program.
7. Asthma sufferers often use _____ as rescue medication. It can quickly and effectively reverse symptoms of bronchiole constriction.
8. People **with type 2 diabetes** usually don't have a problem with insulin production. Instead they **suffer from** reduced sensitivity to the insulin they produce. So patients take _____, sometimes called oral insulin, to improve their insulin sensitivity.
9. In some diseases the person's immune response is part of the problem. When this happens the patient is often **put on** _____ to help suppress their immune response and eliminate some of the symptoms caused by an exaggerated inflammatory reaction.
10. One method of reducing blood pressure is to **put the patient on** _____. The medication is an ARB or angiotensin receptor blocker. It's a relatively new medication that is effective and has fewer side effects compared to earlier blood pressure medications.
11. Migraines can be debilitating and _____ is one of the few drugs that have been proven helpful in treating these headaches.
12. As men age, the prostate gland, which surrounds the urethra increases in size, which makes urination difficult. _____ is a drug that helps to reduce prostate hypertrophy.
13. A current adjunct to blood pressure treatment includes low doses of aspirin. Aspirin is an _____ and its use can reduce the risk of a thrombus forming in a coronary artery.

Check Point (8) – Talking about the skin: Adjectives

Instructions: work with a partner and use the adjectives in the box to complete the sentences. Some word choices will produce strong statements, while others will produce weaker statements. Consider which form is most appropriate for the context.

abrasive, bedridden, callused, dry, extensive, fluid-filled, harsh, hypodermic, inflamed, inoperable, itchy, lumpy, painful, predisposed, red, scaly, severe, swollen, tender, thin, uncomfortable, weakened

1. The patient gave himself daily __hypodermic__ injections of insulin as treatment for his type I diabetes.
2. Some shampoos are extremely __harsh__ and can make your scalp itch.
3. Because of extensive exposure to the sun, construction workers in the southwestern United States are __predisposed__ to developing skin cancers.
4. Melanomas are very dangerous cancers because once they spread they become _inoperable_.
5. Decubitus ulcers can develop quickly in __bedridden_ patients.
6. __callused__ skin is found in areas that undergo constant frictional stress.
7. The skin making up the scalp is extremely __thin__ compared to most other areas of the body.
8. Sunburns can range from mildly __uncomfortable_ to extremely _painful_.
9. __red__, __scaly __ skin is a characteristic of psoriasis.
10. __abrasive_____ soaps can sometimes be used to make rough skin smoother.
11. Chick pox is a viral infection that produces __fluid-filled__ vesicles on scalp, face, chest and arms.
12. Even mild sunburns can remain _tender__ for several days.
13. Shingles is often brought on by a __weakened__ immune system.
14. Dry skin is usually very __itchy__.
15. Cellulite can cause the skin over the thighs to look _lumpy__.
16. Dermatitis can be localized or very __extensive__.
17. Working with strong irritating chemicals can produced __inflamed__ skin.
18. Hives appear as small __swollen__ bumps on the skin.
19. As people age they often develop __dry__ skin.
20. Rubella is a mild infection in children, but can cause __severe__ birth defects if contracted by a woman while she is pregnant.

Self Test

Instructions: Take the self-test below to see how well you remember the information presented in this unit.

1. The skin is composed of ____ layers.
 - a. 2
 - b. 3
 - c. 4
 - d. 5
2. The outermost layer of the skin is called the:
 - a. Dermis
 - b. Hypodermis
 - c. Epidermis
 - d. Subcutaneous layer
3. The protein that water proofs and toughens the skin is called:
 - a. Melanin
 - b. Collagen
 - c. Keratin
4. Most of the accessory structures of the skin are found in the:
 - a. Epidermis
 - b. Dermis
 - c. Hypodermis
5. Adipose tissue is abundantly found in the:
 - a. Epidermis
 - b. Dermis
 - c. Hypodermis
6. Which of the following is not a typical childhood disease:
 - a. Chicken pox
 - b. Measles
 - c. Shingles
 - d. Tonsillitis
7. Which condition is characterized by inflammation of the sebaceous glands?
 - a. Psoriasis
 - b. Xerosis
 - c. Acne
 - d. Erysipelas
8. A common name for this condition is “bed sores.”
 - a. Acne
 - b. Xerosis
 - c. Diaper rash
 - d. Decubitus ulcers
9. Injections that go directly into the blood stream are called:
 - a. IV injections
 - b. IM injections
 - c. SC injections
 - d. Subcutaneous injections
10. A more technical term for a sore or wound is:
 - a. Pus
 - b. Lesion
 - c. Irritant
 - d. Melanoma
11. An allergic inflammatory reaction of the skin is called:

- a. Transdermal reaction
 - b. Contact dermatitis
 - c. Xerosis
 - d. Acne
12. Which of the following is linked to a bacterial infection of the skin?
- a. Xerosis
 - b. Decubitus ulcers
 - c. Dermatitis
 - d. Erysipelas
13. People have about the same number of melanocytes regardless of their skin color.
- a. True
 - b. False
14. Sweat glands are an example of an exocrine gland.
- a. True
 - b. False
15. Wheals are localized allergic reactions to things like insect bites.
- a. True
 - b. False
16. Acyclovir is a medication used to treat psoriasis.
- a. True
 - b. False
17. Cellulite is a condition only seen in obese women.
- a. True
 - b. False
18. Cancers of the pigment producing cells of the skin are called melanomas.
- a. True
 - b. False
19. Long term conditions are called “acute” conditions.
- a. True
 - b. False
20. Prednisone is used to suppress inflammatory responses in patients with conditions such as lupus or dermatitis.
- a. True
 - b. False
21. Insulin is an example of an SC Injectable medication.
- a. True
 - b. False

Suggested Mimi-Lectures

The mini-lectures listed below can be used as topics for instructors to add additional information to this unit or the topics can be assigned to students for classroom presentations.

- ✚ Understanding inflammation
 - Four characteristics of inflammation
 - Pain
 - Redness
 - Edema
 - Warmth
 - Triggers of the inflammatory response
 - Controlling with inflammatory response
 - NSAIDS
 - Glucocorticoids
- ✚ Overview of the sensory receptors in the skin
 - Thermoreceptors
 - Pressure receptors
 - Pain receptors
- ✚ Understanding latent viruses
 - DNA viruses
 - DNA virus infection process
 - Chicken pox
 - Herpes viruses

Key to Check Points

Check Point (1)

1. stratum corneum
2. sweat gland
3. arrector pili muscle
4. artery
5. vein
6. nerve fiber
7. sensory receptor
8. hypodermis
9. dermis
10. epidermis

Check Point (2)

1. M
2. P
3. N
4. H
5. I
6. N,H
7. F
8. C
9. O
10. G
11. G
12. J
13. B
14. D
15. E
16. A
17. F
18. H,G
19. H,M
20. F
21. K
22. L
23. J

Check Point (3)

1. E
2. N
3. J
4. C
5. I
6. F
7. B
8. H
9. M
10. O

11. L
12. K
13. A
14. G
15. D
16. AA
17. WW
18. DD
19. CC
20. U
21. X
22. BB
23. V
24. P
25. T
26. S
27. Z
28. R
29. Q
30. Y

Check Point (4)

1. E
2. F
3. G
4. H
5. I
6. D
7. L
8. M
9. U
10. S
11. N
12. K
13. P
14. T
15. C
16. Q
17. R
18. O
19. J
20. A
21. B

Check Point (5)

1. O
2. G
3. O
4. M

5. G
6. F
7. R
8. N
9. Q
10. C
11. C
12. K
13. O
14. N
15. A
16. D
17. L
18. S
19. B
20. J
21. C
22. C
23. A
24. H

Check Point (6)

1. off, on
2. on, for
3. in, to
4. in, of, on
5. to, to
6. to, in, for
7. to, to, for
8. with, of
9. in, with, in
10. on, on, of, in, at
11. to, for, in, at, for, in

Check Point (7)

1. insulin
2. Warfarin
3. antiemetic
4. epinephrine
5. promethazine
6. interferon
7. formoterol fumarate
8. metformin
9. oral prednisone
10. telmisartan
11. Imitrex
12. Propecia

13. anticoagulant

Check Point (8)

1. hypodermic
2. harsh
3. predisposed
4. inoperable
5. bedridden
6. callused
7. thin
8. uncomfortable
9. red, scaly
10. abrasive
11. fluid-filled
12. tender
13. weaken
14. itchy
15. lumpy
16. extensive
17. inflamed
18. swollen
19. dry
20. severe

Self Test

1. A
2. C
3. C
4. D
5. C
6. C
7. C
8. D
9. A
10. B
11. B
12. D
13. A
14. A
15. A
16. B
17. B
18. A
19. B
20. A
21. A