Continuing Medical Education

Tropical Cutaneous and Subcutaneous Disorders

These diseases are no longer limited to the tropics.

Objectives

After completing this CME, the reader will be able to

1) Articulate the need for understanding tropical cutaneous and subcutaneous diseases

2) Describe the clinical presentation of common tropical cutaneous and subcutaneous diseases

3) Discuss the diagnostic tests and tools required to confirm the diagnosis of common tropical cutaneous and subcutaneous diseases

4) Prescribe an effective treatment regimen for common tropical cutaneous and subcutaneous diseases

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*Following this article, an answer sheet and full set of instructions are provided (p. 196).—**Editor***

By Jeffrey C. Page, DPM and Lauritz Jensen, DA

Tropical cutaneous and subcutaneous disorders are endemic to climates with higher temperatures and increased humidity such as the southern part of the United States and certain tropical regions of Latin America. So why should podiatric physicians practicing in an area with a colder climate care about tropical diseases? The expanding immigrant populations in places like the United States, Canada, England, and Europe have increased the frequency with which such disorders present to physician offices in many parts of the world with more temperate climates. In addition, business travel and tourism to endemic zones can result in an unwelcome microbial hitchhiker of an otherwise productive trip and dream vacation.[1]

Many of the conditions that will be discussed here are also encountered more frequently in populations of a lower socioeconomic status. Adding to these encounters with tropical cutaneous disorders is the increasing number of podiatric physicians who are participating in medical outreach programs or missions to Mexico, Central America, South America, Africa, India, and the Far East—areas with a higher incidence of superficial infectious diseases. While many different skin conditions could be considered tropical, this article will focus only on a few of the more common and challenging cutaneous and subcutaneous disorders that podiatric physicians are likely to encounter in their patients from Third World Countries and during medical outreach activities.

Cultural Sensitivity and Awareness.

It is imperative for the podiatric physician to demonstrate sensitivity to the different cultural backgrounds from which patients with cutaneous disorders may present. Different religious beliefs, unusual healing prac-

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tices involving shamanism, strange herbal remedies, and maternal traditions are part of the patient's character. Openly discounting unwarranted or seemingly irrelevant therapeutic modalities is often counter-productive and may not show respect for what the patient believes to be true. Furthermore, formal education may be limited, and the lack of fluency in language may also

Figure 1: Candida albicans infection in an elderly Mexican patient.

prove to be a formidable barrier to communicating with the patient. Sensitivity to cultural difference is therefore paramount, and avoiding the temptation to summarily dismiss an alternative treatment is perhaps a more productive approach which will gain the confidence of the patient.

A man examined by one of us during a medical mission to Latin America presented with a chronic foot rash. Of note was a profuse apology for the discoloration and smell of his feet caused by his daily application of a salve made primarily of avocado, probably a traditional maternal remedy. Patterns of daily living and employment activities may place different demands on the feet in foreign lands. For example, the farm worker often has his feet in moist soil all day long which may promote fissuring, while a weaver of hand-made textiles will often sit for hours, day after day, on a reed mat with weight borne on the dorsum of the foot, leading to the development of hyperkeratotic lesions on the dorsal foot. The following is a concise introduction to cutaneous and subcutaneous conditions found in the tropics.

Superficial Candidiasis (Cutaneous and Periungual)

Candida albicans is the typical yeast agent isolated from cutaneous and periungual infections; however, other candidal species are potential agents (e.g., *C. kursei, C. tropicalis*), and may occasionally be involved in human disease. Typical manifestations, especially in older patients, include cheilitis—especially at the corners of the mouth— inframammary and other cutaneous rashes (Figure 1), periungual discolorations, and nail deformities (Figure 2). Vulvovaginitis, balanitis, oral candidiasis, and rashes associated with incontinence and geriatric diaper use are also fairly common, especially in the poorly served areas of Latin America and assisted living facilities in the United States. Although C. albicans is described as a constituent member of the normal microbiota of humans—especially the mucocutanous areas—the species is usually only a transient microbe of cutaneous and nail regions of the body.

Nevertheless, candidal yeast is capable of adhering to many surfaces, especially when the growth of normal bacterial flora species is disrupted by an extended course of broad-spectrum antibiotics, when nutritional deficiencies are present, or when elderly patients are incapable of maintaining a state of good personal hygiene. Reduced defenses that are linked to deficiencies in the immune status of the patient are also significant contributing factors and frequently result in unforgettably aggravated and dramatic presentations.

Figure 3: Scabies infestation in an infant.

Figure 4: Scabies infestation on the foot of an infant. *Photo taken by Dr. James Cabeen.*

Figure 2: Candida krusei nail infection in an agricultural worker from Guatemala.

Not surprising, a yeasty smell is frequently quite noticeable; however, culture on Sabouraud agar—especially when the isolated colony counts are high—is more definitive is making the diagnosis. Corrective measures, such as regular bathing and washing of clothing, daily application of topical azoles, and the implementation of other therapeutic interventions usually control yeast infections.[2]

Scabies

Scabies is a common, highly pruritic infestation of the skin that is caused by the mite *Sarcoptes scabiei*. Infestation by the Sarcoptes scabiei leads to an intensely pruritic rash. It is markedly inflammatory in nature and, as a result, almost always produces an intense itching at the site of the lesion. The itching is most intense at night. The female mite is the chief offender and burrows directly into the epidermis. Scabies is highly contagious, and it is likely that multiple members of the same family will be afflicted. Because of the intense itching, patients often present with inflammation and extensive excoriation, and it may prove difficult to locate a primary lesion (Figure 3). The clinician should search for burrows in areas such as finger webs, wrists, axillary folds, the abdomen, buttocks, inframammary folds, and the genitalia in men. Infants, more frequently than adults, may have widespread involvement (Figure 4). Burrows may be 2–15 mm long. Additional nonspecific lesions may include pinpoint erosions, papules, vesicles, scaling erythema, and eczematous inflammation. Rarely, nodules may be found. The rash may be present

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on any part of the body, including the palms and soles.[3,4]

The diagnosis is made when the mite itself, its eggs, or fecal pellets are observed under light microscopy. A small amount of mineral or microscopic immersion oil is placed on visible lesions prior to scraping which, among other things, promotes adherence of the skin cells and mite parts to adhere to the scalpel blade. Figure 5 is a composite image of a mite, an egg, and sybala (fecal material) from a single patient.

Lindane was formerly the most commonly used insecticide for eradication of the infestation, but now, primarily due to the availability of less toxic agents, has limited use. The scabies infestation may be completely eradicated by the use of 5% permethrin, which is applied from the neck down and allowed to remain on the skin overnight.[5] Permethrin has low inherent toxicity and limited percutaneous absorption. It may be appropriate to treat family members and intimate contacts simultaneously. Alternatively, a single oral dose of ivermectin has efficacy at a dose of 200 micrograms/kg. Many clinicians prefer repeating the dose after one week, especially in immune-compromised hosts and those living in crowded conditions.[6]

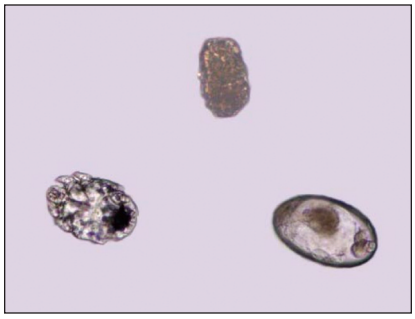

Figure 5: Composite slide of the scabies sybala, mite, and egg.

Pediculosis

Infestation of lice by *Pediculus humanus* is typically a scalp problem (pediculosis capitus), whereas the crab louse or Phthirus pubis involves the pubic region. These lice feed on the skin and often produce marked but localized irritation (e.g., pruritis, skin excoriation from excessive scratching). The eggs, which are appropriately referred to as nits, are firmly cemented to the hair shaft. Nits (Figure 6) are more visible than living lice and are considered reliable for a positive diagnosis. The female louse lays approximately six eggs per day up to one month and then dies. The louse hatches in 8–10 days and matures in 18 days. Most adults carry approximately 20 lice.

Figure 6: Nits on the hair of a child from Guatemala.

Lice are transmitted by close personal contact. This includes sexual activity, the sharing of combs, hats, clothing, and sleeping in the bed of an infected person. Treatment is similar to scabies in that a topical cream or shampoo must be employed. Permethrin 1% shampoo or pyrethin shampoo are effective remedies. The medication is left on the hair and scalp for at least five minutes before being washed off. Malathione is also rapidly effective and is useful for lice resistant to pyrethins and permethrin. It should not be used for infants and neonates.

A single oral dose of ivermectin repeated in ten days is also effective. After the affected area is treated, the hair is combed with a fine toothed comb to remove nits, and the area treated again a second time. Close contacts may also need treatment, and clothing and bed linens must be laundered or placed in a sealed plastic bag for 24-48 hours.

Figure 7: Cutaneous leishmaniasis on the ankle of a child from Guatemala associated with cellulitis.

Figure 8: Discoid ulcerations of cutaneous leishmaniasis in a young male.

Cutaneous Leishmaniasis

Cutaneous leishmaniasis is endemic to a number of parts of the world, including the Middle East and Latin America.[7] It is considered one of the most serious skin diseases in many developing countries[8] and often produces long-term chronic conditions. During our medical outreach activities to Central America, *Leishmania braziliensis* and *L. mexicana* were the most frequent species encountered, specifically in the Peten Department of Guatemala. In this region "chicleros" or men who make their living working under the dense tropical canopy harvesting the tree gum are at particular risk. The biological vector is the *Lutzomyia*, a blood-sucking sand fly. Initially, an ulcer forms at the bite site, and will become quite conspicuous and develop into impressive, purulent lesions (Figures 7 and 8).

A confirmed diagnosis may be obtained by scraping the open lesion or biopsy and examining the material microscopically. The observed amastigotes (the tissue tissue stage or trypanosomal form that lacks a flagellum) will conclusively confirm the clinical diagnosis. In medical outreach clinics this may not be possible and the physician will be forced to rely on empiric reasons for treatment. And, unless the patient is properly treated, dissemination of the parasite may occur. Even if the ulcer spontaneously heals as evidenced by the formation of a large cicatrix on the leg or foot, dissemination and an insidious recurrence is a real possibility. Mucosal involvement of the nares and mouth is also possi-

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ble and may result in an unwanted "plastic surgery" sculpted by the microbial invader. The patient in Figure 9 presented with disfiguring lesions and scars in many areas of the body. He was subsequently referred and appropriately treated at a regional medical center.

Systemic treatment with antimonials, readily available through endemic zones in Latin America, is effective and eradicates the infection quickly. Antimonial sodium stibogluconate is commonly given in a dosage of 20 mg/kg over 20 days. Some authors have advocated the addition of allopurinol or the use of fluconazole. Local heating, curettage, and topical meglumine antimoniate or imiquimod may hasten resolution.

Figure 9: Severe scarring of the torso resulting from recurrent leishmaniasis, not initially treated for the cutaneous form.

In a systematic review conducted for the Cochrane Database,[8] the authors assessed 49 trials involving 5,559 participants. Some of the conclusions reached included a significant benefit of cure for Leishmania major infections with the use of 200 mg of oral fluconazole, topical 15% paromomycin plus 12% methylbenzethonium chloride, and photodynamic therapy. In this study, oral pentoxifylline was a good adjuvant therapy to intramuscular meglumine antimoniate. Oral Itraconazole was useful for Leishmania tropica infections as well as intralesional sodium stibogluconate and thermotherapy.

A second systematic review for the Cochrane database[9] demonstrated that in American cutaneous leishmaniasis, intramuscular meglumine antimoniate was better than oral allopurinol, but that the two in combination were superior to either alone. Furthermore, intravenous meglumine antimoniate administered for 20 days was superior to shorter dosing regimens, even when the latter were combined with topical agents. Patients suffering from leishmaniasis recidivans are often resistant to the usual treatments.

In an Iranian study of 32 patients, a combination of allopurinol and intramuscular injection of meglumine antimoniate was used successfully with minimal side-effects.[7] A study in Pakistan of 200 patients with leishmaniasis compared itraconazole 100 mg twice daily with intramuscular meglumine antimoniate and determined that itraconazole is more effective, economical, and has fewer side-effects than meglumine antimoniate.[10] Side-effects of systemic antimonials include both minor (fever, rash, pruritis, erythema, arthralgia, abdominal pain) and serious (chest pain, hyperamylasemia, increased liver enzymes, pancytopenia, renal and hepatic failure) adverse effects.[11]

Cutaneous Larva Migrans (CLM)

Also known as creeping eruption, cutaneous larva migrans CLM is most commonly caused by an invading filariform larva of a dog or cat hookworm (e.g., *Ancylostoma caninum, Braziliense*) (Figure 10). It is the most common tropically acquired dermatosis in the world. Other manifestations include neuroretinitis, eosinophilic pneumonitis, myositis, folliculitis, erythema multiforme, or ophthalmological manifestations.[12] Parasites are found in moist dirt contaminated with pet fecal material. The filariform larva is the infective stage and directly penetrates into the cutaneous tissue.

Common in the Caribbean, a person who walks barefoot on contaminated soil is at risk. In fact, the larvae penetrate any exposed cutaneous area.[13] The clinical appearance is distinctive with a progressive linear, or serpiginous, raised, erythematous border occurring most commonly in the foot. It frequently stings or causes intense itching. The infestation can occur in both children and adults.[14]

Albendazole, a benzimidazole derivative, has proven efficacy against cutaneous hookworm disease and is perhaps the most widely available and most inexpensive antihelminth agent sold in developing countries. Thiabendazole topical paste preparations are also valuable and rapidly absorbed, eradicating the worm. *A. caninum* and *A. braziliense* are basically dog parasites, and the human is an accidental, dead-end host. Consequently the invading juvenile worms will eventually die, even without treatment. Albendazole or thiabendazole simply hastens the process and provides quicker relief.

Actinomycetoma and Eumycetoma

This condition is also known as Madura foot, being first described in the Madura area of India in the

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Figure 10: Filariform larva or the infective stage of cutaneous larva migrans.

Figure 11: Micrograph of Fusarium oxysporum. Note the banana shaped macroconidium.

Figure 12: Mycetoma Fusarium culture. Note the characteristic violet color.

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1880's. It has subsequently been described from many tropical areas of the world and is endemic in Africa and portions of Latin America. In general, mycetomas are linked to wound contamination or possibly traumatic inoculation (e.g., thorn penetration, insect bite) of an environmental bacterial or fungal microbe. The foot is often the site infected. Actino-mycetoma is caused by an actinomyces bacterial agent, which usually responds well to antibiotic treatment. Fungal agents are much more insidious and difficult to treat. Consequently, it is essential that the clinician identify the causative agent as quickly as possible. During a medical mission, this can be accomplished by examining the expressed exudates, Gram stained, and observing the bacterial cells under the oil immersion lens. Interestingly, many different fungal agents have been linked to eumycetomas, including *Madurella mycetomatis, M. grisea, Pseudallescheria boydii, Fusarium oxysporum* (Figure 11), *F. solani,* etc. Laboratory diagnosis of fungal involvement is possible by culturing the agent or observing the mycelia mass in a histological section or from exudates (Figure 12).

There is no racial predilection but men are more than twice as likely as women to acquire the infection. The most common age of onset is between 20 and 50 years. Thought to be associated with local trauma, mycetoma is most commonly found in the foot and leg, the hand, or the torso. The disease may penetrate to deeper structures, causing disfigurement, but it is rarely fatal. Pulmonary and cranial extension has been reported.[15]

The initial clinical presentation is often nothing more than painless subcutaneous swelling along with a history of a puncture wound at the site. This is followed by the development of subcutaneous nodules which are then followed by much more swelling and induration (Figures 13 and 14). The classic manifestation of mycetoma is the development of draining sinuses productive of small grains containing clumps of causative organisms. The color of the grains may be characteristic of certain pathogens, although a more complete laboratory diagnosis may be established through Gram staining, periodic acid-Schiff (PAS), and culture (Figure 15).[16]

Figure 13: Enlargement and induration from untreated Fusarium mycetoma in a Guatemalan fisherman.

Figure 14: Fusarium mycetoma. The white granulomas are positive for fungal colonies.

Figure 15: Probable co-infection of actinomycetoma and eumycetoma with draining sinuses in a woman from the jungles of the Yucatan Peninsula.

Although it may not be possible to reverse the chronic effects of the disease, management of eumycetoma or actinomycetoma is appropriately first directed at the infecting organism through the systemic administration of an antifungal or an antibacterial agent respectively. Two drugs administered in five week cycles are recommended for actinomycetoma and this regimen may be repeated once or twice. Trimethoprim sulfamethoxazole, dapsone, and Rifampin have been effective. Ketoconazole, voriconazole, Itraconazole, and Amphotericin B have been used effectively in the treatment of eumycetoma. Extended treatment (up to 10 months) for fungal agents is obligatory, however, and resistance has been documented.[17] Surgical intervention has been employed through excision of localized lesions, drainage of sinuses, and amputation. Unfortunately, because of the need for long-term systemic azole therapy, fungal mycetomas are extremely difficult to treat in primitive conditions in Third World Countries because of the necessity of long-term systemic azole therapy. The expense and potential for adverse toxicity reaction are overwhelming to the patient. Over-the-counter pain medication may give some palliative relief and allow the patient to sleep better.

Lymphedema (Filarial and Podoconiosis)

Some principal causes of lymphedema of the lower extremities include infectious (e.g., filarial parasites) and non-infectious (e.g., podoconiosis, obesity, malignancy) entities. In essence, the condition occurs when the lymphatic vessels are damaged and the flow of the lymph is significantly impeded. To say the least, it is an insidious and progressive disease that can only minimally be treated in an outreach clinic. Virtually all the cases of lymphedema should be referred to a community treatment center for long-term management.

In the Americas, filariasis (elephantiasis or the mosquito-transmitted parasite *Wuchereria bancrofti)* is most common to Brazil, and endemic cases would not be expected in most other Latin American countries. Podoconiosis, as indicated by the word's etymology, refers to dust or mineral particles that invade and afflict the barefoot farmers who work in silica-rich volcanic soil. It seems to occur most often in African and Central and South American regions.

Spectacular cases of lymphedema are seen in clinic stations, particularly in remote localities. Marked swelling, infected nodules, and mossy lesions of the feet and

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toes (Figure 16) are characteristic manifestations, and invading microbes only add to the inflammatory reactions and further promote gross deformities.[18]

Effective management requires

Figure 16: Mossy lesions on the foot and toes of lymphedema patient, a resident in the Department of Peten in Guatemala.

manual lymph drainage and short stretch bandaging applied by a skilled lymphedema specialist.

Conclusion

The cutaneous and subcutaneous disorders described above are most frequently encountered in tropical climates but are appearing with increasing frequency in temperate climates. For some of these tropical disorders, such as scabies and pediculosis, the treatment is straightforward, while the management of other conditions such as lymphedema can be very challenging. Sensitivity to the patient's cultural background will enhance the patient-doctor relationship. In any case, successful management of tropical cutaneous and subcutaneous disorders is dependent upon accurate and early diagnosis, which is itself made easier by heightened awareness and an understanding of the clinical presentation of these disorders. ■

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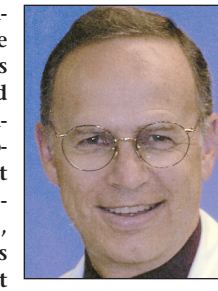

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Dr. Jensen earned a Bachelor of Science and Master of Science from Brigham Young University (Parasitology) and a Doctor of Arts (Microbiology) from the University of Northern Colorado. His post-doctorate was completed at Brigham Young University, where he served as the Co-principal Investigator on the Epidemiology of Echinococcosis grant (NIH Al 10588). He has more than 25 years of teaching experience in the biological sciences, specializing in microbiology. He currently serves as the Chair of the Department of Microbiology at Midwestern University, Glendale Campus, and has served as the Executive Director and the President for DOCARE International (12 years of experience organizing medical outreach programs in Mexico and Central and South America). His research interests are tropical diseases, with special attention given to the epidemiology of campylobacteriosis.

EXAMINATION

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See answer sheet on page 197.

1) No matter where you practice, you may encounter tropical skin disorders because
   A) Expanding immigrant populations may bring people to your community from tropical regions.
   B) Patients may bring such disorders home with them from vacation or business travel.
   C) You may be involved with community outreach or humanitarian missions.
   D) All of the above

2) Patients with tropical skin disease may come from a cultural background that differs from yours. Which of the following statements is LEAST correct?
   A) A lack of fluency in language can limit trust between patient and caregiver and may interfere with compliance.
   B) Different religious beliefs, healing practices, herbal remedies, or maternal traditions followed by the patient should be discounted because there is no scientific evidence of their efficacy.
   C) The podiatrist should show respect for the esteem that the patient has for a shaman or medicine man or risk losing the respect of the patient.
   D) The patient may be allowed to employ herbal remedies as long as they do not directly interfere with your treatment.

3) Which of the following statements regarding superficial candidiasis is NOT correct?
   A) Oral thrush and diaper rash are characteristic manifestations.
   B) *C. albicans* is a normal member of the mucocutaneous flora.
   C) Candida species are commonly found in the nail.
   D) Yeast is sensitive to commonly available topical antifungals.

4) You are working with an older, obese patient who is a cement worker and who wears rubber boots to work every day. He complains of nail deformities and periungual discoloration. Upon physical examination you also notice erosions in the abdominal skin folds and cheilitis. You suspect that his dermatologic manifestations are related to his employment. Select from the list below, another potential contributing factor to the development of candidiasis:
   A) Nutritional deficiencies
   B) Peripheral vascular disease
   C) Autoimmune disease

5) You are volunteering in a homeless shelter when a mother brings in her 2 year old daughter with concerns about the child's constant scratching. This has been going on for more than a month. Excoriations cover the arms and legs and much of the torso of the toddler. The palms and soles are spared. Looking at scrapings from some of the lesions under the microscope, you identify a mite. Which of the following statements about this patient is NOT correct?
   A) Limited, casual contact can spread the infestation.
   B) The infesting parasite only lives on humans.
   C) This parasitic infestation can affect the palms and soles.
   D) Permethrin cream should be applied and left on overnight.

6) In the patient described above, the itching is most intense at night. You would
   A) expect to find only burrows caused by the mite in addition to excoriation.
   B) need a skin biopsy to acquire the parasite.
   C) explain to the mother that the itching is caused by the laying of eggs and fecal material in the burrows caused by the mite.
   D) use lindane applied in the evening and left on overnight for this toddler because of its lower toxicity.

7) In an Alabama clinic you encounter a patient with multiple, painless, raised lesions, some of which have ulcerated and crusted, adjacent to areas of skin disfigured by scar tissue. The patient has had these progressive lesions for years but did not have access to health care, thus no previous treatment has been provided. He used to work in the jungle harvesting the gum of the chicle tree. Your patient asks you what this is and what you can do about it. You respond:
   A) All that will be needed to confirm the diagnosis will be cultures for bacteria and fungi.
   B) A scraping or biopsy looking for amastigotes of the sand fly must be performed to confirm the diagnosis.
   C) Oral ivermectin must be promptly prescribed to prevent further disfigurement.
   D) All of the patient's family members would need treatment and bed linens would have to be washed.

8) You are treating a 37 year old migrant farm worker for draining sinuses on his foot. This all started several years ago with swelling and slowly progressed to multiple deep nodules and an area of induration. It has not been particularly painful, but he became concerned when some of the raised areas broke open and started to drain. Which of the following statements about this infection is MOST accurate?
   A) To obtain the diagnosis, you need only submit material for a fungal culture or PAS stain.
   B) Treatment for bacterially caused infections of this type must persist for 10 months.
   C) Even in non-immunocompromised patients, this infection is frequently fatal.
   D) You should attempt to recover grains discharged from the sinuses to facilitate culture and because their color may give an indication of the causative organism.

9) After culturing the material obtained from a deep sampling of a nodule in the patient described above, the lab reports the presence of *Fusarium oxysporum*. Treatment for this infection
   A) should include a 10 month course of oral Itraconazole.
   B) may succeed with dual antibiotic therapy including trimethoprim sulfamethoxazole and Rifampin.
   C) may be augmented by the use of allopurinol.
   D) must include antimonials to be successful.

10) Your daughter is sent home from elementary school by the school nurse because she has a communicable disease. You see lots of small white spots attached to the hair that cannot be brushed out. You suspect infestation by Pediculus humanus and undertake treatment which must include all EXCEPT:
   A) Permethrin 1% shampoo
   B) Combing the hair with a fine tooth comb
   C) Oral antimonials for resistant cases
   D) Laundering all clothing and bed linen for the entire family

11) Pediculosis
   A) does not cause localized irritation or excoriation from scratching.
   B) does not occur in neonates.
   C) typically presents with hundreds of lice infesting each patient.
   D) can be cured with a single dose of oral ivermectin if topical management fails.

12) Which of the following statements about Creeping Eruption is MOST correct?
   A) It is a highly contagious disease.
   B) It is the most common tropically acquired dermatosis in the world.
   C) Cutaneous larva migrans occurs only in adults.
   D) The infestation is transmitted via a mosquito vector.

13) Causes of lymphedema may include all of the following EXCEPT:
   A) A filarial parasite
   B) Infestation by Actinomycetes
   C) Obesity
   D) Invading dust or mineral particles

Continued on page 196

Continuing Medical Education

EXAMINATION

(cont'd)

14) Your patient from Brazil presents with a multi-year history of severe, unilateral swelling and a bumpy, "mossy" appearance of the skin on the dorsum of his foot. He has recently developed cellulitis surrounding some inflamed nodules. Which of the following statements about this patient's disease is NOT true?

A) Oral antibiotics will resolve both the cellulitis and the edema.
B) The edema could be the result of infestation by the parasite *Wuchereria bancrofti.*
C) Manual lymph drainage will help to reduce the fluid in the leg.
D) The edema of this progressive disease may be somewhat improved by the use of short stretch bandages.

15) Which of the following statements about Madura Foot is MOST accurate?

A) Women are more likely than men to acquire the disease.
B) Eumycetoma is caused by microaerophilic bacteria.
C) Actinomycetoma presents in only the foot or the hand.
D) Two antibiotics administered over five week cycles are required for actinomycetoma.

16) Your friend recently returned from a vacation to the Caribbean where she spent a lot of time on the beach. She walked every morning along the water with others, some of whom were walking their dogs. She presents with a stinging rash on the foot that is serpiginous, raised, and erythematous. Your statement to your friend should be

A) This rash is caused by a parasite that can be treated either with an oral medication or a topical paste.
B) This is a fungal infection usually responsive to topical antifungals.
C) This rash will not resolve without treatment and without sequellae.
D) This should be treated promptly to avoid infecting family members as well.

17) You performed a needle aspirate of the open, draining lesions on the lower leg of your patient and amastigotes of the Lutzomyia sand fly were identified. Select the best course of treatment from the choices below:

A) Intralesional injections of corticosteroid
B) Broad spectrum parenteral cephalosporin antibiotics for 6 weeks
C) Antimonial sodium stibogluconate orally over 20 days
D) Excise the ulcerations and apply a skin graft

18) Which of the following vectors can transmit an organism leading to lymphedema?

A) sand fly
B) hook worm
C) mosquito
D) cockroach

19) Which of the following vectors can transmit an organism leading to Leishmaniasis?

A) sand fly
B) hook worm
C) mosquito
D) cockroach

20) Which of the following vectors can transmit an organism that causes CUTANEOUS LARVA MIGRANS?

A) sand fly
B) hook worm
C) mosquito
D) cockroach

See answer sheet on page 197.

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ENROLLMENT FORM & ANSWER SHEET (cont'd)

EXAM #2/11
Tropical Cutaneous and Subcutaneous Disorders (Page and Jensen)

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

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