Travel Dermatology
8th Annual Travel Medicine National Conference

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Walnut Creek, CA

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Dermatology Objectives
- Cite common skin ailments observed in travelers
- Define best practices for diagnostic and management strategies for skin disease in travelers

Dermatology Objectives

Disclosures for D. Scott Smith
- None

Geosentinel Derm Diseases

Travel Derm Disease
- Insect bites
- Cutaneous larva migrans, Allergic reactions
- Skin abscesses
- Leishmaniasis
- Myiasis

Travel Derm Disease List
- Leishmaniasis
- Cutaneous Larva Migrants (CLM)
- Dracunculiasis
- Onchocerciasis
- Strongyloides
- Cutaneous Amoebiasis
- Loaasis
- Filariosis

Travel Derm Disease List
- Tungiasis
- Myiasis
- Lice
  - Head, Body, Pubic
- Scabies
- Bedbugs
- Catepillars
- Hymenoptera

## Lesion Types

- Papular Lesions
- Nodular/Subcutaneous Lesions
- Macular Lesions
- Linear Lesions
- Skin Ulcers

## Nodular and Subcutaneous Lesions

- Myiasis
- Tungiasis
- Loa Loa
- Filarisis
- Gnathostomiasis

## Papular Lesions

- Insect bites
- Bedbugs
- Fleas
- Scabies
- Onchocerciasis
- Schistosomiasis

## Macular

- Tinea versicolor
- Tinea corporis
- Lyme disease

## Linear

- Cutaneous Larva Migrans
- Phytophotodermatitis
- Lymphocuticular spread of infection

## Ulcers

- Leishmaniasis

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**Image:** Lesion examples

- Papular lesion
- Nodular/Subcutaneous lesion
- Macular lesion
- Linear lesion
- Skin ulcer
Bug Bites on the Beach in Brazil

Leishmaniasis

- Infection with obligate intracellular protozoa *Leishmania*
- Three clinical forms:
  - Cutaneous
  - Mucocutaneous
  - Visceral
- Clinical features: geography, organism, immunity, genetics
Leishmaniasis: Vector

- Female sandfly: Phlebotomus (Old World) Lutzomyia (New World)
- Reservoir: rodent, sloth, anteater, rat
- Central & S. America, Africa, India, Middle East, TX
- Recently reported in N. TX
  - L. mexicana
  - Burrowing wood rat: Neotoma micropus

Leishmaniasis: Morphology

- Two morphologic forms: amastigotes & promastigotes
  - Amastigotes:
    - In host (humans & other mammals)
    - Oval, nonflagellated
    - 2-4 micrometers
  - Promastigotes:
    - In vector (sandfly gut)
    - Spindle shaped, flagellated
    - 10-15 micrometers

Life Cycle of Leishmaniasis

- Promastigotes multiply in sandfly gut
- Migrate to proboscis
- Parasites inoculated as promastigotes
- Transform into amastigotes (inside histiocytes)

Cutaneous Leishmaniasis

- Acute "oriental sore"
  - Initially furuncle
  - Ulcer & crusts; "volcanic"
  - Satellite papules
  - "Iceburg" SQ nodule
- Chronic (>1 year)
  - Nonhealing CCL (erysipeloid), resembles lupus vulgaris (face), L. tropica "dry urban"
- Disseminated: anergy; ~lepromatous leprosy
  - L. aethiopica, L. mexicana, L. braziliensis
- Old World: Baghdad/Delhi boil
  - L. tropica, L. major "wet, rural"
- New World: uta, bay sore, chiclero ulcer
  - L. Mexicana, L. peruviana

Cutaneous Leishmaniasis

- Majority acute infxns resolve spontaneously
- Scar (cicatricial stage)
- Presentations:
  - Varicelliform, Psoriasiform, Eczematous, Verrucous, Keloidal
  - Hypoesthetic

Mucocutaneous Leishmaniasis

- Ulcer @ inoculation site (heals rapidly)
- Months later: ulcers arise (nose & mouth)
  - hematogenous spread
  - Erosion of nasal septum, soft palate, lips (10-20 yrs) → disfigurement, espundia
- L. braziliensis
- Relentlessly progressive, TX-resistant
**Mucocutaneous Leishmaniasis**

DDX: Syphilis, TB, leprosy

**Visceral Leishmaniasis**

- Kala-azar, Dumdum fever
- *L. donovani*, *L. chagasi*;
  - *L. infantum* in kids
- Fever, emaciation, HSM, ascites, pancytopenia (epistaxis, purpura)
- "Earthy grey" skin pigmentation: temples, perioral, hands/feet
- Skin lesion at inoculation site
- Spreads to reticuloendothelial system (spleen, liver, BM, LN)
- Death within 2 years if untreated

**Post kala-azar Dermal Leishmaniasis**

- Sequelae of Kala-azar
- Several years after TX
- Hypopigmented macules (trunk, arms)
  - Possible photosensitivity & malar erythema
- Warty papules/nodules
  - Chronic reservoir of infxn
- Skin lesion at inoculation site
- Diffuses to reticuloendothelial system

**Leishmaniasis: Diagnosis**

| Pathology: Giemsa stains amastigotes stain red or dark blue (not PAS) |
| Diffuse plasma/histiocytic infiltrate |
| Histiocytic intracytoplasmic inclusions |
| Serology, EM |
| PCR for speciation |
| Nicolle-Novy-MacNeal media (NNN) |
| Leishmanin (Montenegro) |
| Intradermal skin test: read @ 48-72 h |
| Cutaneous: + in 1-3 mo |
| Visceral: + after TX only |
| Diffuse: negative |

**Leishmaniasis: Treatment**

- **Cutaneous form self-limited**: usually no treatment needed
- **Sodium stibogluconate** (antimonial) for 20-28 days; possible cardiotoxicity
- Other unproven TX: freezing, local heat, pentamidine, amphotericin B, azoles (ketoconazole)

**Prevent!**

- Insect repellent
- Destroy animal reservoir
- Vaccination (problems with virulence)

**Tungiasis (Order Siphonaptera)**

- *Tunga penetrans* flea
- Pregnant female burrows into legs/feet & lays eggs
- Pea size painful nodule; abscess, central punctum
- Possible lymphangitis, gangrene, ulcer
- TX: curette or excise; ivermectin if multiple
Tungiasis

- **Pediculus humanus var. capitatis**
- Confined to scalp, common in children
- Intense itching → excoriations → possible pyoderma
- + Cervical LAD, fever

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Head Lice (Pediculosis Capitis)

- **Pediculus humanus var. capitis**
- Confined to scalp, common in children
- Intense itching → excoriations → possible pyoderma
- + Cervical LAD, fever

- **Dx**: microscopic examination for nits (0.8mm eggs firmly attached to hairs)
- **Tx**: Permethrin, pyrethrin, malathion, lindane, nit combs

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Body Lice

- **Pediculus humanus var. corporis**
- Poor hygiene transmitted by clothing or bedding
- Macules/papules at bite sites
- Intense itching neck/trunk; vertical excoriations
- VS scabies: hands/feet unaffected
- Adult organisms rarely found (nits in clothing)
- Vector for relapsing fever, trench fever, epidemic typhus
- **Tx**: wash/dry clothing

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Crab Lice (Pediculosis Pubis)

- Phthirus pubis; STD, pediculosis
- Common; tends to recur; pubic but can spread to eyelashes, beard, axillae
- Excoriations → pyoderma
- Maculae caeruleae: blue, slate-blue ax macules; trunk & thighs in more severe, chronic infestations
- **Tx**: like head lice; petrolatum (eyelashes)
Management of *Phthirus pubis*

**Lice Summary**

**Three types:**

- **Head lice:** *Pediculus humanis capitis*
- **Body lice:** *Pediculus humanis corporis*
- **Pubic lice:** *Phthirus pubis* (Crabs)

**Treatments**

- **Head lice:**
  - Topical lotions: 1% Permethrin cream (*Nix*), Pyrethrin (*Rid, A-200, Pronto and Clear*), Malathion (*Ovide*) by prescription
  - Oral: Ivermectin (single-dose)
  - Wet combing
- **Body lice:**
  - Clean body and wash clothing and bedding in water at least 130°F
  - Lindane lotion (not anymore)
  - Corticosteroids
- **Pubic lice:**
  - Topical: Permethrin 1%, and Pyrethrin lotions.
  - Oral: Ivermectin
  - Hygiene

*Thanks to Stacy Zambrano*
Human Scabies

- *Sarcoptes scabiei*, fertilized female burrows in the stratum corneum and deposits eggs
- Spread by close contact
- Pruritic papules, excoriation
- Linear burrows
- Predilection: finger webs, wrists, axilla, areola, umbilicus, lower abdomen, genitals, buttocks

Human Scabies: Variants

- Lesions sparse in a patient with good hygiene
- Scabies Inconspicuous: masked by steroids
  - Systemic steroids
  - Topical steroids
- Nodular scabies: reddish-brown, pruritic nodules, covered areas; likely mite debris, hypersensitivity
- Bullous scabies: common in children (vesicles, pustules)

Human Scabies: Diagnosis

- Skin scraping for eggs, feces, or mites
- Curettage
- Biopsy
**Human Scabies: Treatment**

- **Permethrin 5% cream: 1st line**
  - Efficacy, low toxicity
  - Wash after 10 hours.
- **Lindane 1%** (not as effective)
  - CNS toxicity (10% absorbed) – r/o history of seizures first
  - Not for infants, kids, pregnant/nursing
  - Wash after 8 hours.
- **Sulfur (precipitated sulfur 6%)** QHS X 3 nights
  - Messy and stinky
  - Safe and effective for all ages + pregnancy/nursing
- **Ivermectin** 200 μg/kg single dose, repeat in 1 week.

**Other Mite Dermatitis**

- **Cheyletiella**
  - ‘Walking dandruff’
  - Grouped pruritic small crusted papules
  - Necrosis of older lesions
  - Sores face
- **Demodex**
  - Pilosebaceous follicle
  - Folliculitis, rosacea
- **Murine**: *Allodermanyssus* (fleet wall itch)
  - *Ornithonyssus bacozi* (murine typhus)

**Bedbugs (Cimicidae)**

- Order: **Hemiptera**
- *Cimex lectularius & C. hemipterus*
  - Hide in cracks/crevices & feed at night
  - Produce urticaria, severe
  - “Breakfast, lunch, dinner”

**Bed Bug nymph *Cimex lectularius***

- ingesting a blood meal from the arm of a “voluntary” human host
- not vectors in nature of any known human disease

**Bed Bugs (or Bedbugs) are small, elusive, parasitic insects of the family Cimicidae.**

- Adult bedbugs are reddish-brown, flattened, oval, and wingless
- Microscopic hairs give them a banded appearance
- Adults grow to 4–5 mm in length and 1.5–3 mm wide

**Bed Bugs (continued)**

- 27 known pathogens (some estimated as high as forty-one) are capable of living inside a bed bug or on its mouthparts
- Yet there are no known cases of such transmission.
- The salivary fluid injected by bed bugs can cause skin to become irritated and inflamed, although individuals can differ in their sensitivity.

**Food**

- *Acarus* (grain mite)
  - *Glycyphagidae* (cheese)
  - *Tyrophagus* (grocery)
- **Harvest “Chiggers”**
  - *Trombicula* sp.
  - *Scrub typhus* (Asia)
  - Legs then thin skin
- **Fowl** (bird exposure)
  - *Dermanyssus*
  - *Ornithonyssus* can cause W. equine encephalitis

**Bedbugs (continued)**

- Scanning electron micrograph (SEM) of *Cimex lectularius*, digitally colorized with the insect’s skin-piercing mouthparts highlighted in purple and red.
Bed bug - in action - ingesting blood

* ingesting a blood meal from the arm of a "voluntary" human host
* common bed bug is found worldwide
* anecdotal reports suggest that bed bugs are increasingly common in the United States, Canada, and the United Kingdom

Source: http://phil.cdc.gov/phil

Bed bugs in the news

U.N. policy paper encourages farming insects for food

* The United Nations Food and Agriculture Organization is reviewing a policy paper, written by a Dutch entomologist Arnold van Huis, which argues for consuming more insects.
* Bugs are cheaper to feed; high in protein and calcium; and much less of an environmental burden than livestock like cows, pigs, and chickens.
* Insects are also biologically different from humans, thus less susceptible to contagious diseases.
* There are about 1,400 edible bugs in the world.

Posted By Jennifer T. Parker Friday, August 6, 2010

Lepidoptera: Caterpillars

* Irritation from hairs contacting the skin
* Toxins in hair → pain, pruritic red macules, wheals
* “Tram-track” purpura

Puss caterpillar, Megalopyge opercularis

Name that Caterpillar!

Choices: Io Moth, Hagmoth, Buck moth, Wooly Bear, Saddleback

Saddleback Caterpillar, Sibine stimulea

Buck moth

Wooly Bear Caterpillar

Io moth, Automeris io

Hagmoth (9 pairs)

Hymenoptera

* Bees (Apidae), wasps & hornets (Vespidae), ants (Solenopsis)
* Honeybees die after stinging; hornets (colorful) & wasps (darker) do not
* Remove stinger quickly!
* Mild pain, local edema
* Severe systemic rxn in 0.4-0.8%.
* Honeybee venom: phospholipase A
Hymenoptera
- Fire ants (*Solenopsis*) & Harvester ants (*Pogonomyrmex*)
  - *Solenopsis richteri* (black)
  - *Solenopsis invicta* (red)
- Aggressive; Venom *Solenopsin D*
- Stings are painful and cause sterile pustules
- 2-part: (1) bite (2) swivel → circular pattern, 2 central puncta
- Desensitization for allergic patients (possible anaphylaxis)

Hookworm summary
*A. duodenale, N. americanus*
- EPI: 1 billion people infected world-wide, tropics; NO animal reservoir
- DX: eggs in stool; suggestive: anemia, eosinophilia
- DZ: Anemia
- RX: Mebendazole 100mg BID x 3d or Albendazole 400mg ONCE
- PREV: Shoes; fertilize without night soil

Cutaneous Larva migrans
(dog or cat hookworm)
Lying on the beach where “No dogs allowed signs are not enforced”
**Hookworm folliculitis** from (Pasteur Merieux MSD, Health & Travel, Eric Caumes) 1999

**Cutaneous larva migrans**

- Larvae of domestic cats/dogs
- Most common: *Ancylostoma braziliense*, rarely *A. caninum*
- Human is aberrant, dead-end host (confined to the epidermis)
- Walking barefoot: animal feces contaminated ground; viable for wks
- Symptoms: 1-6 days and last 2-8 weeks
- Classic serpiginous & pruritic lesions, representing migratory path w/i epidermis (1-2 cm/day)

**Tx:** Albendazole 400mg oral X 1 dose or ivermectin 12mg oral X 1 dose

**Case**

Wiggling lumps on the scalp and arm after a tour of the rainforests in Beliz
Dermatobia hominis (third stage larva) D. Scott Smith

Myiasis @10x D. Scott Smith

Courtesy of Ted Long, SMS III 2002
**Human Botfly**

- First (A), second (B) and third (C) stage larvae and adult fly (D)

U.S. Dept. of Agriculture, Miscellaneous Publication No. 631

**Dermatobia hominis, second stage larva (from Belize)**

Markell, Medical Parasitology, p. 367 8th edition

**Myiasis**

- Infestation of human tissues by fly larvae (insect order Diptera)
  - Accidental (eating eggs or larvae)
  - Facultative (eggs laid on malodorous or festering wounds)
  - Obligate (necessary for fly development – true parasitism)

Obligate Myiasis: The Human Botfly *D. hominis*

- A parasite of humans, cattle, swine, cats, dogs, horses, sheep and other mammals in Central and South America.
- Adults fly (15mm) catch various bloodsucking flies and attach eggs to their sides; eggs hatch to larvae and are deposited.
- The larvae feed under the skin.
- Feeds 4-10 weeks.

Myiasis
Order: Diptera

- **Diptera fly:**
  - **Botfly:** *Dermatobia hominis*
    - Eggs deposited on insect.
  - **Tumbu fly:** *Cordylobia anthropophaga*
    - Eggs deposited on sand, blankets, clothing (iron!).
- **Wound myiasis**
- **Furuncular myiasis**
- **Tx:** Remove (occlusion).

Do not remove a fly from your friend's forehead with a hatchet.

--Chinese Proverb

Myiasis SEM of mature 3rd stage larva *Dermatobia hominis*

as = anterior spiracles
oh = oral hooks
ah = abdominal hooklets
ps = posterior spiracles

Courtesy Dr. David A. Henderson
Dracunculiasis

- Nematode *Dracunculus medinensis*; remote sub-Saharan Africa villages
- Larvae mature into worms over 10 weeks (up to 70-80 cm!) (dissolved by stomach acid releasing the larvae)
- Larvae are ingested in small aquatic water fleas (*cyclops*)
- Pregnant female migrates to skin, forming a papule → bullae which ruptures. Worm releases larvae on contact with water
- Tx: Extraction of the worm (stick), Metronidazole

Onchocerciasis

- *aka River Blindness*
- Filarial nematode (roundworm) *Onchocerca volvulus*
- Transmitted by the black fly of genus *Simulium*
- Found in Africa, few parts of Central and South America
- Sometimes called "buffalo-flies" due to hump-back stance

Onchocerciasis

- Initially: *Oncocercomas*, or SQ nodules (adult worms) papular dermatitis around microfilariae
- Chronic disease: Inguinal LAD & obstruction
  - *Lizard / Elephant*: wrinkled, lichenified, thick, pigmented
  - *Leopard skin*: Depigmentation/atrophy; perifollicular sparing
- Microfilariae in the eye: sclerosing keratitis, uveitis, blindness
**Onchocerciasis: Diagnosis**

1. Path: nodule containing adult worms
2. **Skin snip** (in saline) - microfilariae emerge
   - Also visualized in the anterior chamber or cornea (slit-lamp exam)

**Onchocerciasis**

- Treat with **ivermectin**
- Surgically **excise head nodules** (prevents ocular disease)
- Prevention is via vector control and mass treatment in endemic areas
- In Africa, use of *Bacillus thuringiensis isrealensis* to destroy aquatic stages of Simulium

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**Strongyloidiasis**

- Intestinal nematode (roundworm)
- **Direct penetration** of larva into skin from soil
- Spread via blood to lungs
  - **Autoinfection**: penetrate alveoli; coughed up & swallowed, then mature into parasitic females in GI tract.
  - Risk factors include frequent soil contact, immunosupression, and institutionalization

**Strongyloidiasis**

- Skin manifestation: **larva currens** ("racing larva"), urticarial, serpiginous; intense itching
- Migrates 5-10 cm per day
- Occurs on buttocks, groin, trunk
- Possible urticaria and pruritus ani
- **Hyperinfection** (dissemination) w/GI sx's, cough, & widespread petechiae/purpura
  - **"Thumbprint sign"**: purpura around umbilics in hyperinfection
- **DX**: Peripheral eosinophilia & larvae in stool/skin
- **TX**: ivermectin or thiabendazole

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**Loaiasis**

- Caused by Loa Loa
- W & Ctrl Africa
- Vector: **mango fly, Chrysops**
- Clinical: **calabar swellings** (painful SQ edema), worm under the conjunctiva
- **Dx**: clinical, microfilariae in daytime blood sample, serology
- **Tx**: remove adult worm, DEC

**Loaiasis**

- Caused by Loa Loa
- W & Ctrl Africa
- Vector: mango fly, Chrysops
- Clinical: Swellings (painful SQ edema), worm under conjunctiva
- **Dx**: clinical, microfilariae in daytime blood sample, serology
- **Tx**: remove adult worm, DEC

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**Filariasis**

- Filarial worms *Wuchereria bancrofti, Brugia malayi, Brugia timori*
- Vector: mosquito (bite)
- **Acute lymphangitis → chronic lymphedema** with eventual enlargement and deformity of leg/genitals
- **Dx**: demonstration of microfilariae **night** blood sample, serologic test
- **TX**: DEC, ivermectin
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References