INFESTATIONS...
What is bugging you!

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Objectives

• Define clinical presentations that can be affiliated with infestations
• Identify bugs that have implications for patients
• Review treatment options for infestations!

Scabies Mite Infestation

• Sarcoptes scabiei var. hominis
• Extremely pruritic papules
• Axillae, genitals, waist, finger webs

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Treat contacts, wash recently worn clothes and bedding in hot water!

Other Complications

- Post-scabetic pruritus
- Bacterial infection!
Head Lice: Pediculosis capitis

- Pruritus
- Infest the head and neck
- Spread through direct contact

Body or Head Lice (Pediculosis)

- *Pediculus humanus* var. corporis or capitis
- Body louse is vector for:
  - Epidemic typhus
  - Relapsing fever
  - Trench fever
- Check seams of clothes or bedding
- Head lice – only nits may be seen
Crab Lice (Phthiriasis)

- Pediculosis pubis
- A sexually transmitted disease by close contact
- May be in genital region, eyelashes, or axilla
- Yellow brown to gray specks on skin
- Slate blue macules – maculae cerulae

Head Lice Treatments

- Permethrin and pyrethrin
- Lindane
- Malathion
- Ivermectin
- Spinosad
- Benzyl alcohol

- Wet combing
- Petroleum ointment
- Mayonnaise
- Dimethicone lotion
- Sodium chloride gel
- AirAlle (LouseBuster)
**Cimex lectularius**

- Cimicidae commonly infest humans (*C. lectularis*), birds, rodents, and bats
- Eradicated until the 1950's
- Increasing insecticide resistance (pyrethroids, permethrin, and deltamethrin) and travel leading to higher prevalence
- 45x increase in the number of bed bug cases from 1999 to 2006 in Australia

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**Bedbugs**

- Appear shield-like and leathery
- Obligate, nocturnal, weekly blood feeder
- Live w/o meal for up to a year
- Infestation may be related to birds, bats, or rodents
- 1º host migrates bedbugs search for alternate food source
- Not associated with
  - Poor hygiene
  - Socioeconomic classes
- No transmission of MRSA, Hepatitis B/C/E, HIV
- Possible transmission Kaeng Khoi virus isolated from bat bugs in Thailand (*Cimex insuetus*) to guano mine workers

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Clinical Features

• Papular urticarial, targetoid, bullous, grouped (breakfast-lunch-dinner) lesions with punctum on exposed skin
• Worse in AM
• Signs manifest up to 11 days after exposure
• Only 30% of people living in infested households experience skin reaction

Where are they??

- Spread via ductwork, electric wiring, used furniture/mattresses, and travel
- Love dark small crevices
- Hiding places include:
  - Under furniture
  - Between book sheets
  - Mattress/within seams
  - Picture frames
- Avoid smooth glossy surfaces like tiles in bathrooms
OTC Repellants

- 7% picardin (Cutter Advanced/Sawyer) or 0.5% permethrin (Coleman Insect treatment Gear & Clothing/Sawyer) not effective
- N,N-diethyl-m-toluamide (DEET) provided high level of repellency against bed bugs
- Isolongifolenone and isolongifolanone are just efficacious natural products but not yet available
  - Natural compound from South American Tauroniron tree

Temperature?

- Cimex highly resilient to environmental stress
- 48°C (118.4°F) for 1 hr → complete mortality (tolerant to 46°C)
- -16°C for 1 hour (3.2°F) -20°C → complete mortality
- Cold hardened of 0°C for 1 hour allowed for survival at -16°C
- Steam

Chemical + Non-chemical Treatment Methods

- Patient education
  - Removal of all non-treatable furniture (mattresses)
  - Washing in hot water followed by hot drying for 30 minutes
  - 10 hours in home-freezer
  - Membrane mattress covers impervious to bedbugs (small nymphs can pass through zippers)
  - Surveillance of sleeping area for insects (home and hotels)
  - Place closed luggage in bathtub
- Pest control
  - Combination insecticides due to high rates of resistance
  - Steam killing + insecticide
  - Heat killing focusing on problem areas
  - Professionals with experience in bed bug infestation
  - Bug sniffing dogs

References:
Public Health Concern

• Significant mental and economic public health impact although exact costs cannot be identified
• Bed Bug Chasers of Iowa City
  – $2000-4000 for whole house heat treatment 122 F+
  chemical treatment (organophosphate for non-treatable items and 6 product combination including chlorfenapyr and amorphous silica)
  – $1000 for apartment
• Springer Bed Bug Services:
  – $1200 for heat treatment + chemical treatment plus additional cost for warranty
  – Dogs sniff out bedbugs if not visualized

Cimex lectularius

• Female feeds at night needs blood meal to lay eggs
• Linear urticarial plaques (Breakfast, Lunch, Dinner)
• Hepatitis B surface antigen carrier - Role in transmission

Lyme Disease

• Borrelia burgdorferi spirochete

1. www.cdc.com/lyme

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**Erythema migrans**
- Seen in 60–90%
- 1–2 weeks after tick detachment
- Erythematous, annular plaque
- Light colored center or "bull's-eye" appearance
- **Primary lesion** must reach at least 5 cm (per CDC)
- Multiple plaques appear in 20-25% of patients
  - Multiple bites
  - Disseminated disease
  - Lymphatic spread
- Pathology is often non specific

**Other complications**
- Arthralgias (knee is common)
- Neurologic (facial nerve palsy)
- Cardiac (AV nodal block)
- Ocular (conjunctivitis, uveitis, optic neuritis – rare)

“A single 200-mg dose of doxycycline given within 72 hours after an *I. scapularis* tick bite can prevent the development of Lyme disease.”

- Adult or nymph stage *I. scapularis* tick
- Estimated to have been attached for >36 hours
- Within 72 hours of tick removal
- Local rate of infection is greater than or equal to 20 percent
- No contraindication to doxycycline

Not recommended for other antibiotics