
OTHER ARTHROPODS IN HEALTHCARE SETTINGS

Kait Chapman – Extension Entomologist



Photo provided by Jody Green

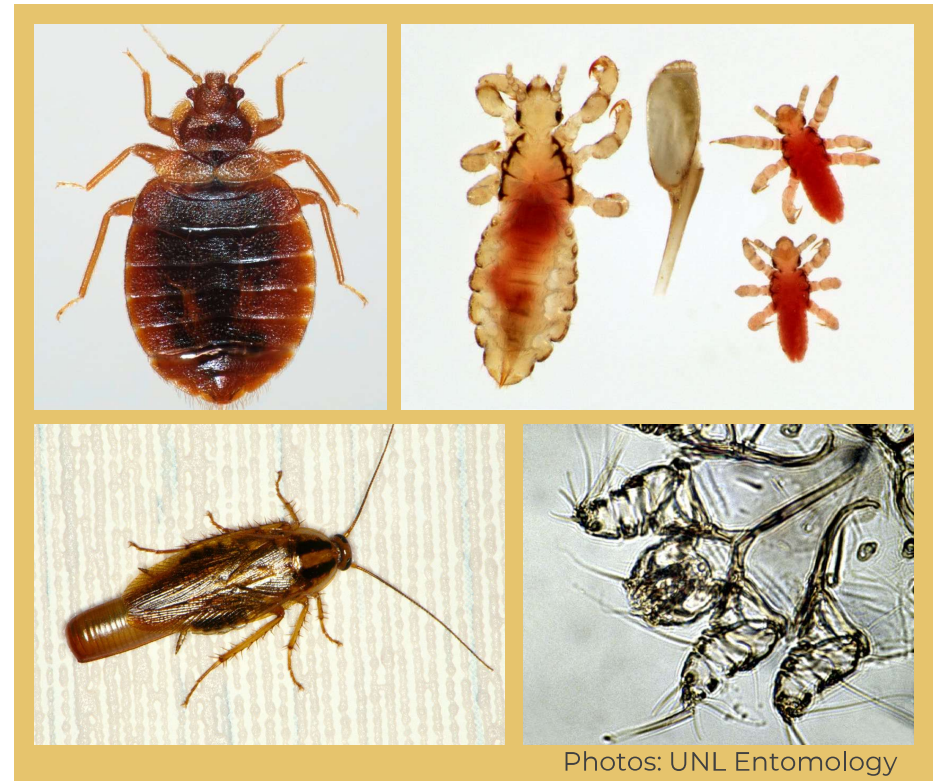


HUMAN BED BUG
Cimex lectularius

Photo provided by UNL Entomology

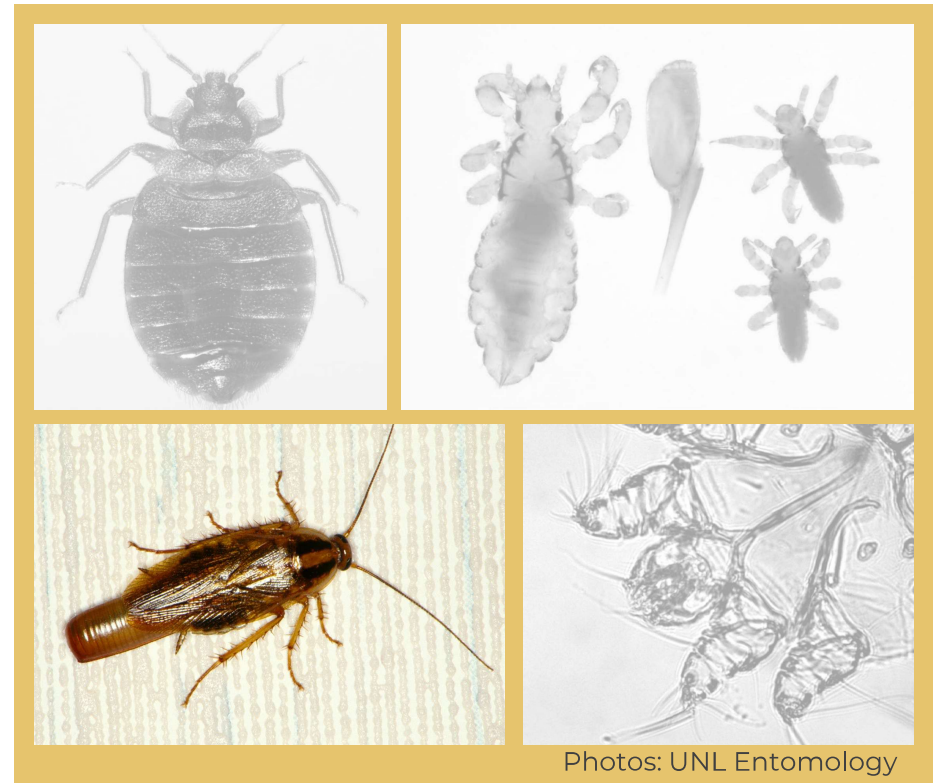
WHY “BUGS” MATTER IN HEALTHCARE

- Bite
- Allergies & asthma
- Live on the body or in the environment
- Transmit illness (directly or indirectly)



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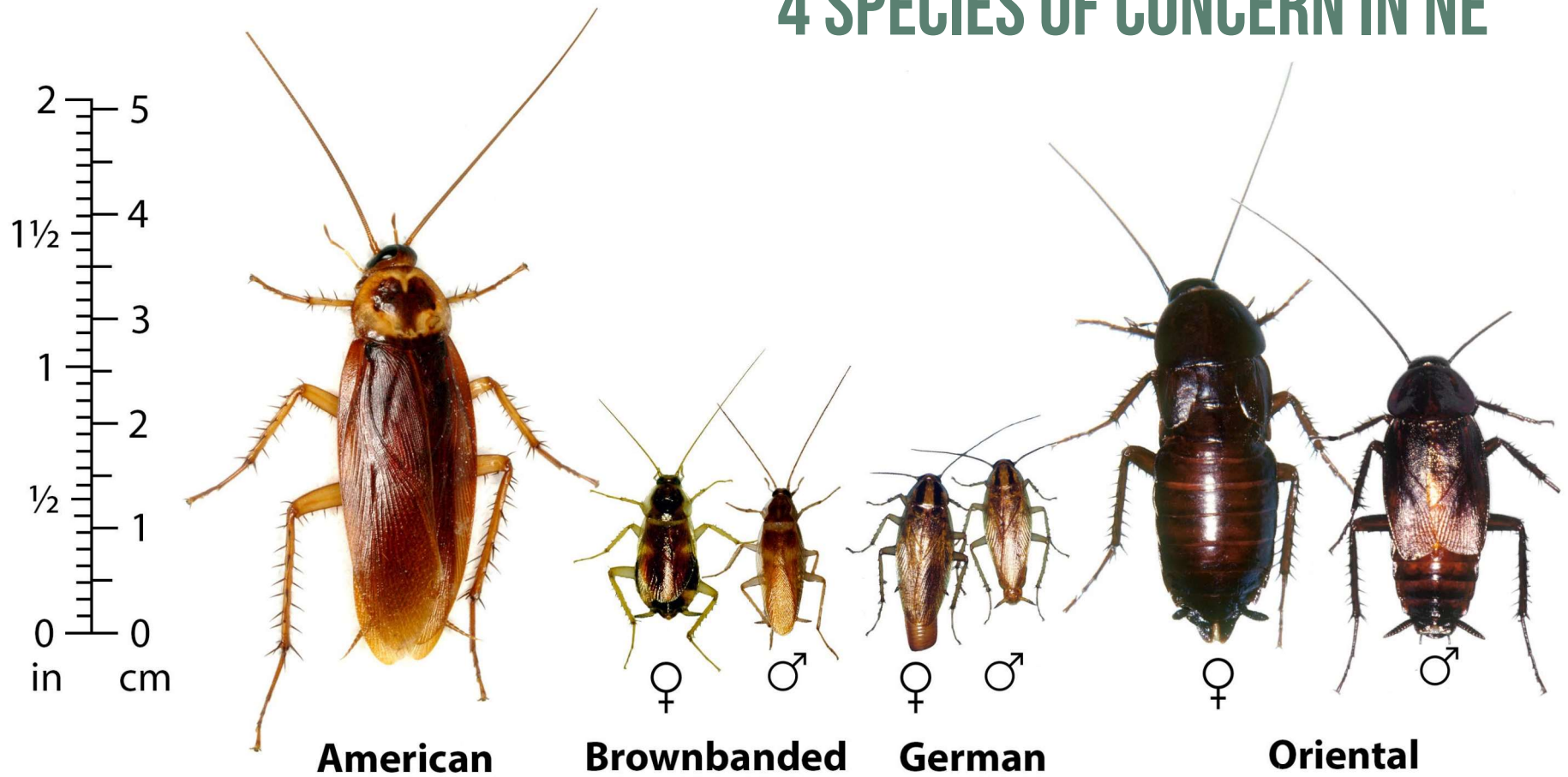
Photos: UNL Entomology



COCKROACHES

Order: Blattodea

4 SPECIES OF CONCERN IN NE



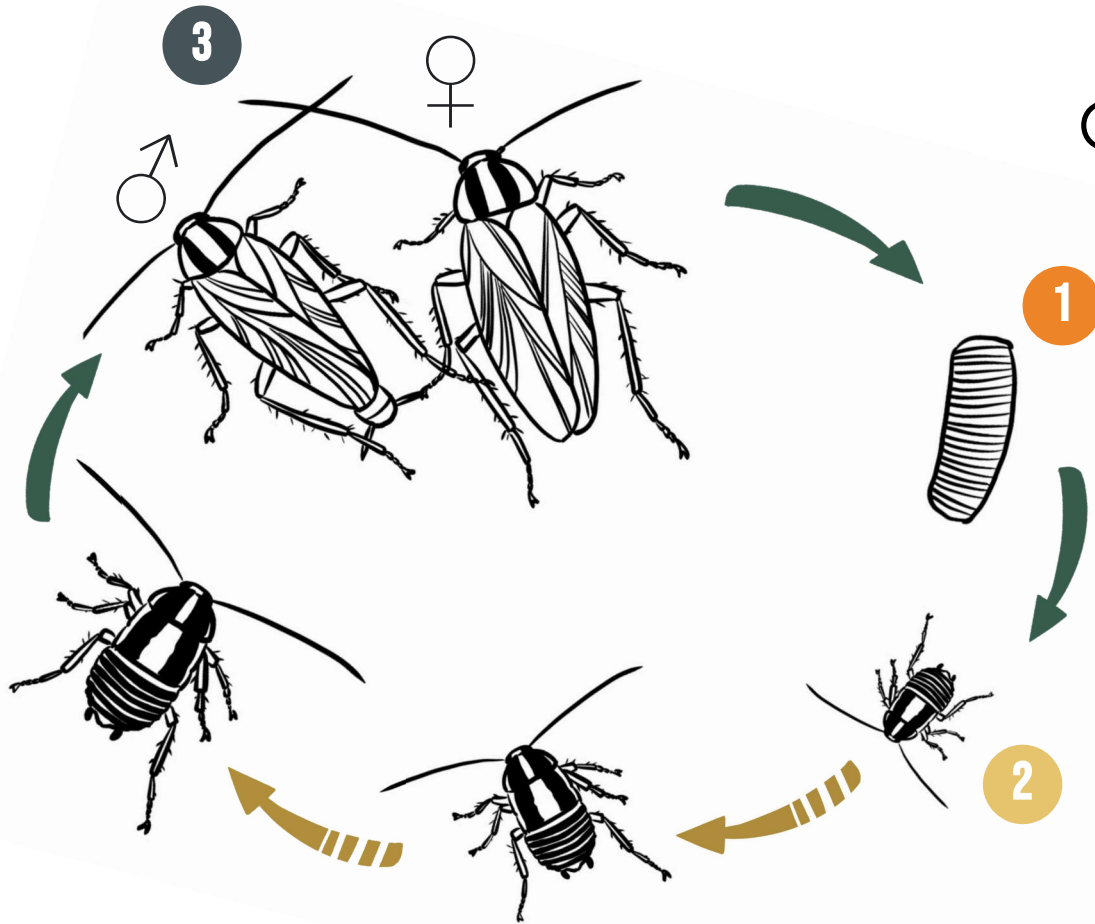
GERMAN COCKROACH

Blattella germanica

- Most well-known
- Widely distributed indoor urban pest worldwide
- Cause significant, long-term economic expenses to people

Photo: UNL Department of Entomology





LIFE CYCLE

Gradual metamorphosis

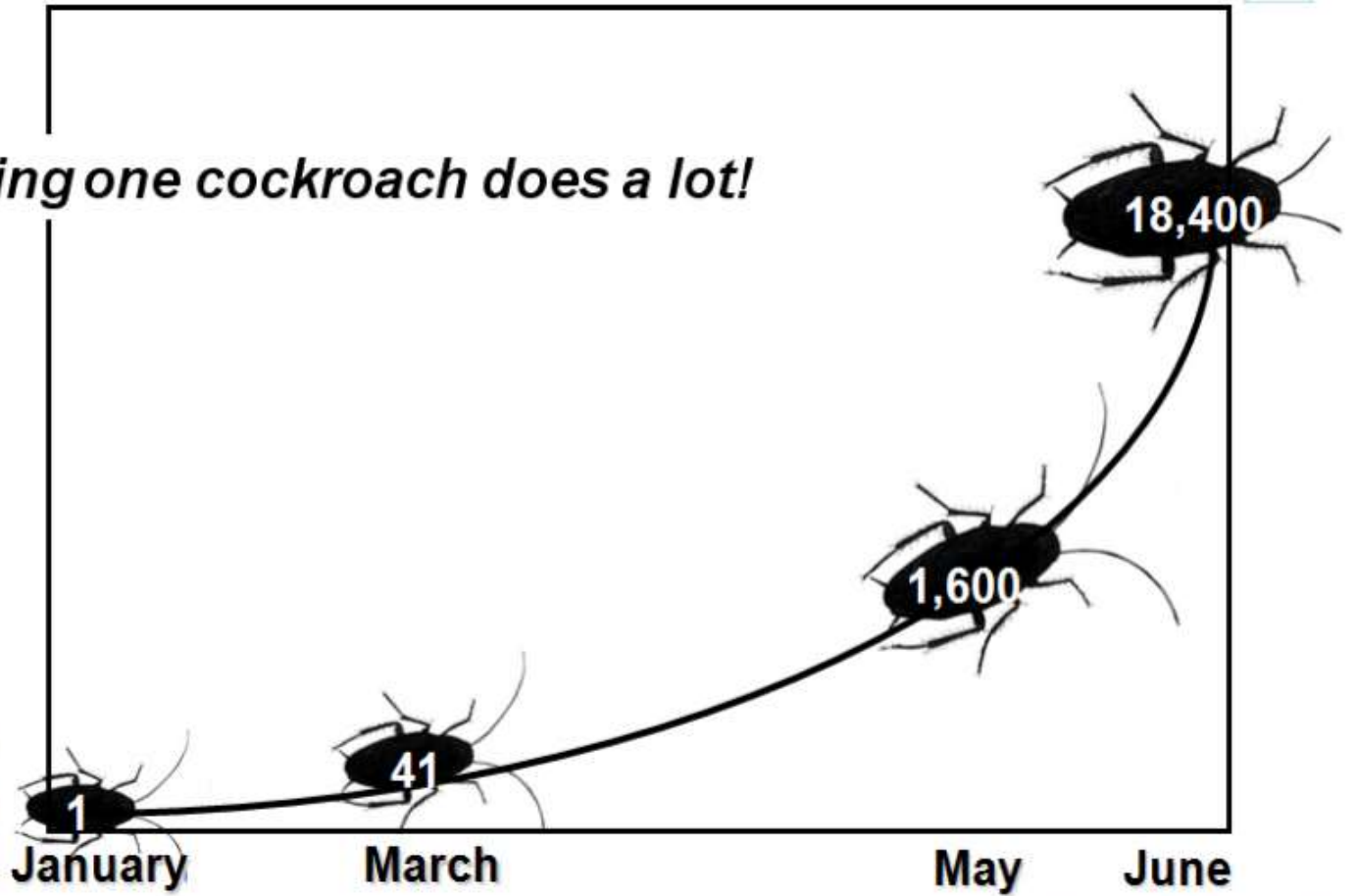
- 1 Oothecae
- 2 Nymphs
- 3 Adults

Figure: Arizona Pest Management Center



Stopping one cockroach does a lot!

One pregnant cockroach



COCKROACHES AND ILLNESS

100 potential pathogens



CONTACT



EXCRETIONS



CAST SKINS

- Salmonella
- Staphylococcus
- Streptococcus
- Coliform
- And more!

COCKROACHES & ALLERGIES

- Allergens in cockroach feces, saliva, and shed exoskeletons



COCKROACHES & ALLERGIES



OTHER ARTHROPODS IN HEALTHCARE SETTINGS



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COCKROACHES & ASTHMA

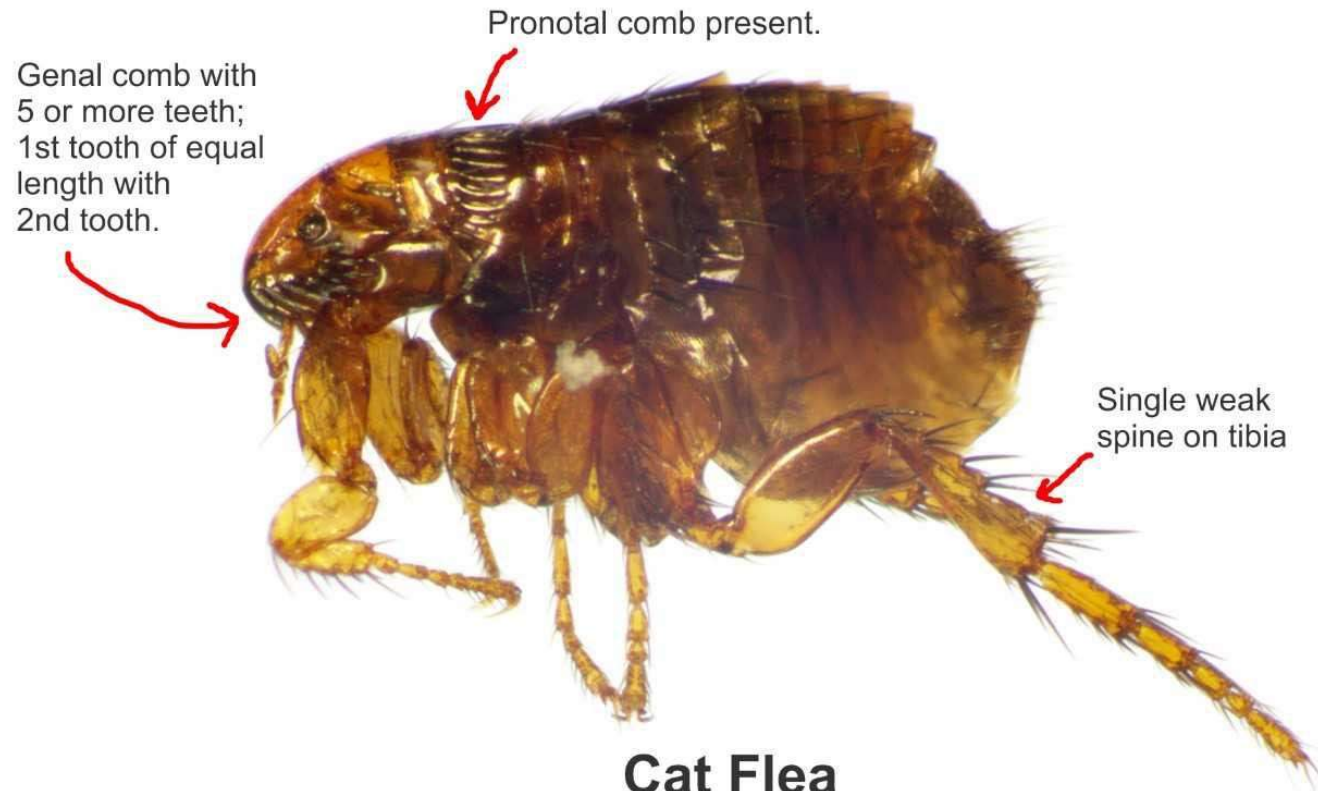
- **23-60%** of urban dwellers with asthma are allergic to cockroaches (Portnoy *et al.* 2013)
- Children who grow up in cockroach-infested apartments have **higher rates of asthma** (Portnoy *et al.* 2013)
- A single intervention for cockroach control **reduces asthma morbidity** in children (Rabito *et al.* 2017)



Photo provided by Jody Green

FLEAS

Order: Siphonaptera



Cat Flea
Ctenocephalides felis

FLEAS

Bites

- *Usually* located on lower legs
- Bites can result in red, raised welts

Associated Diseases

- Bubonic plague
- Murine typhus
- Tapeworm
- Cat scratch fever

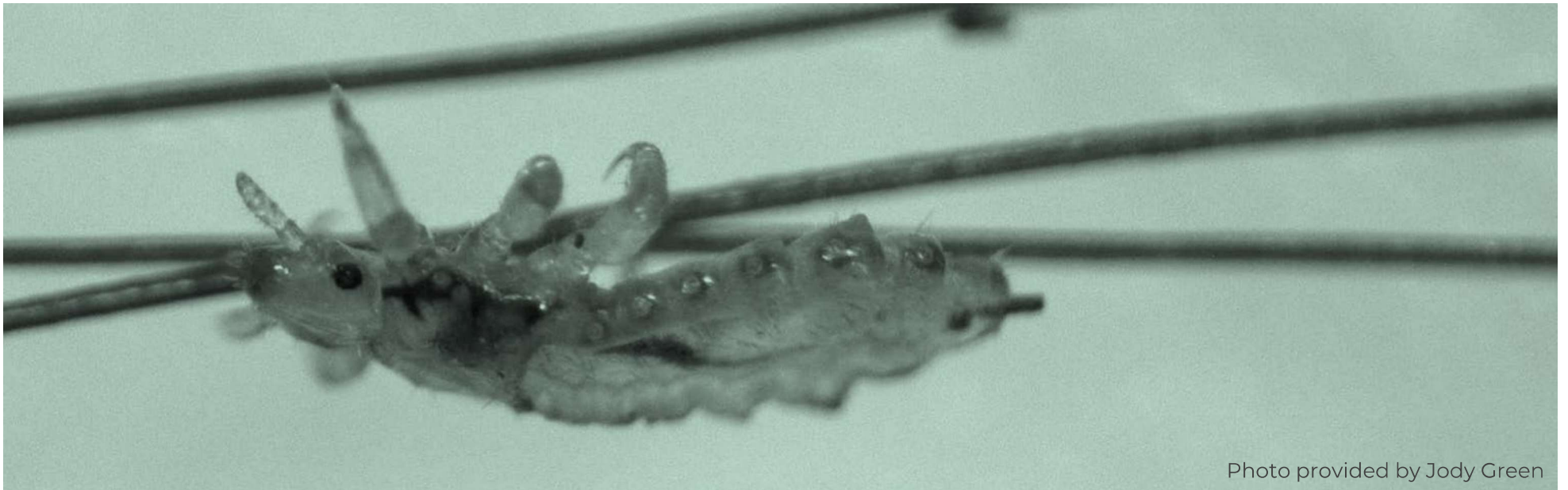


Photo provided by Jody Green

LICE

Order: Phthiraptera

SIGNS & SYMPTOMS OF LICE

- Discomfort
- Itchiness
- Tickling sensations
- Difficulty sleeping
- Rashes or secondary infections from scratching
- “Lice dirt”





Photos 1-3: Jody Green
Photo 4: UNL Entomology

IDENTIFYING CHARACTERISTICS

- Six legs
- Wingless
- Flattened
- Specialized claws

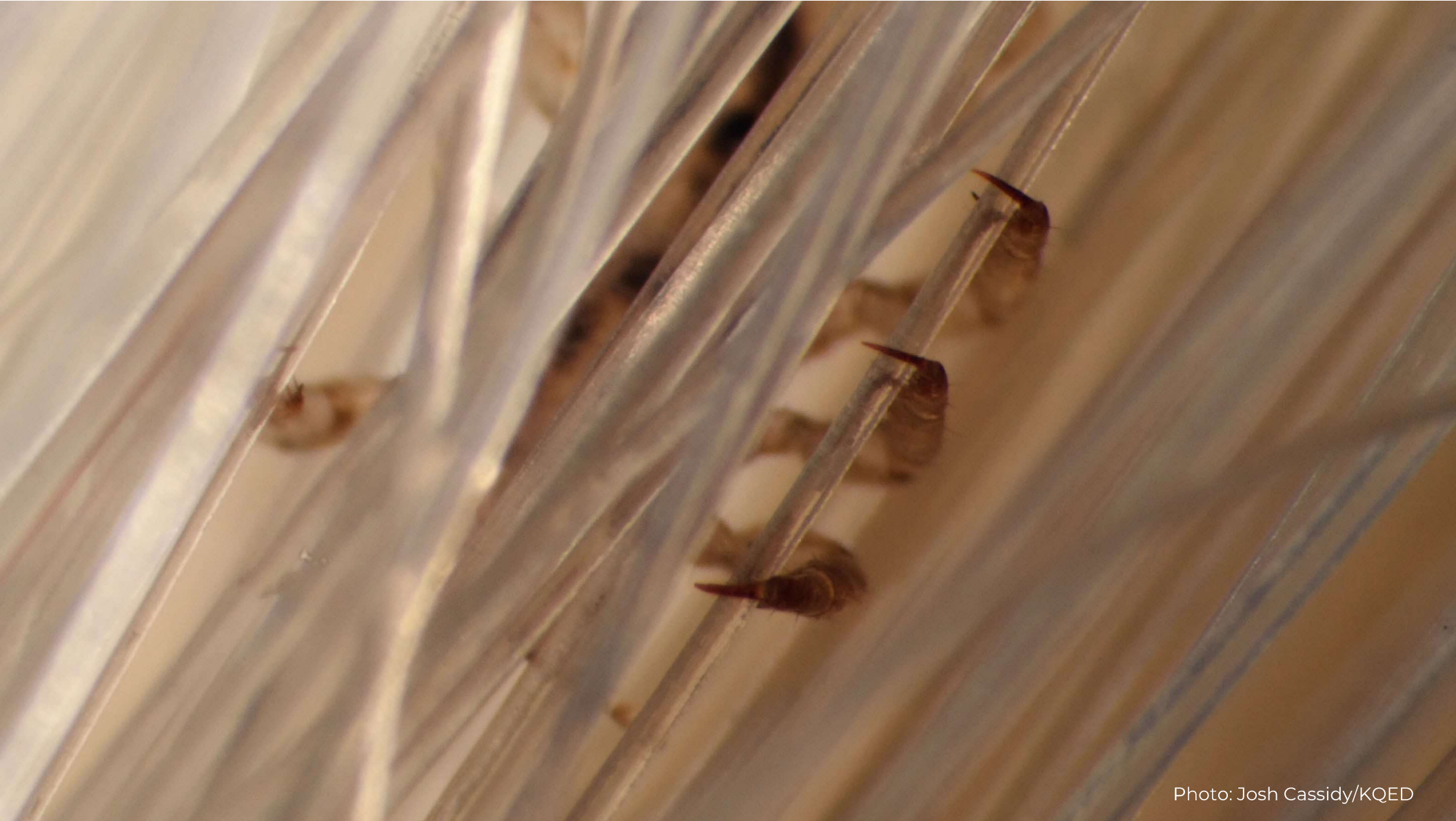


Photo: Josh Cassidy/KQED

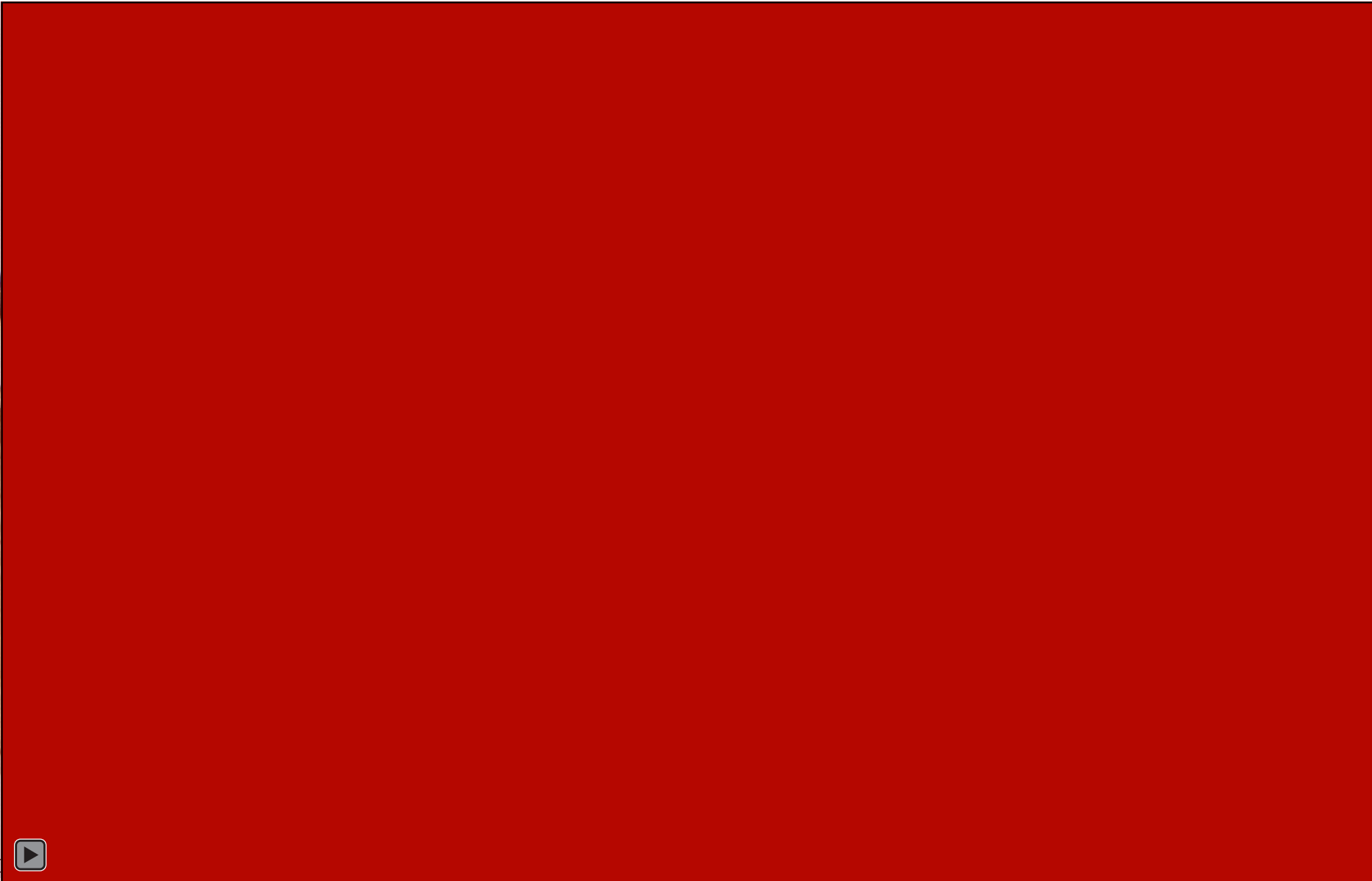


Photo and video: 3



There are three types of lice:
Head, body, and pubic lice



Head louse

Photo: Lorenza Beati
Used with permission



Body louse

Photo: James Gathany
Public Health Image Library (PHIL)
Public domain



Crab louse

Photo: Matt Bertone
Used with permission

Compiled by: Siavash Taravati, UC IPM program

HEAD LICE

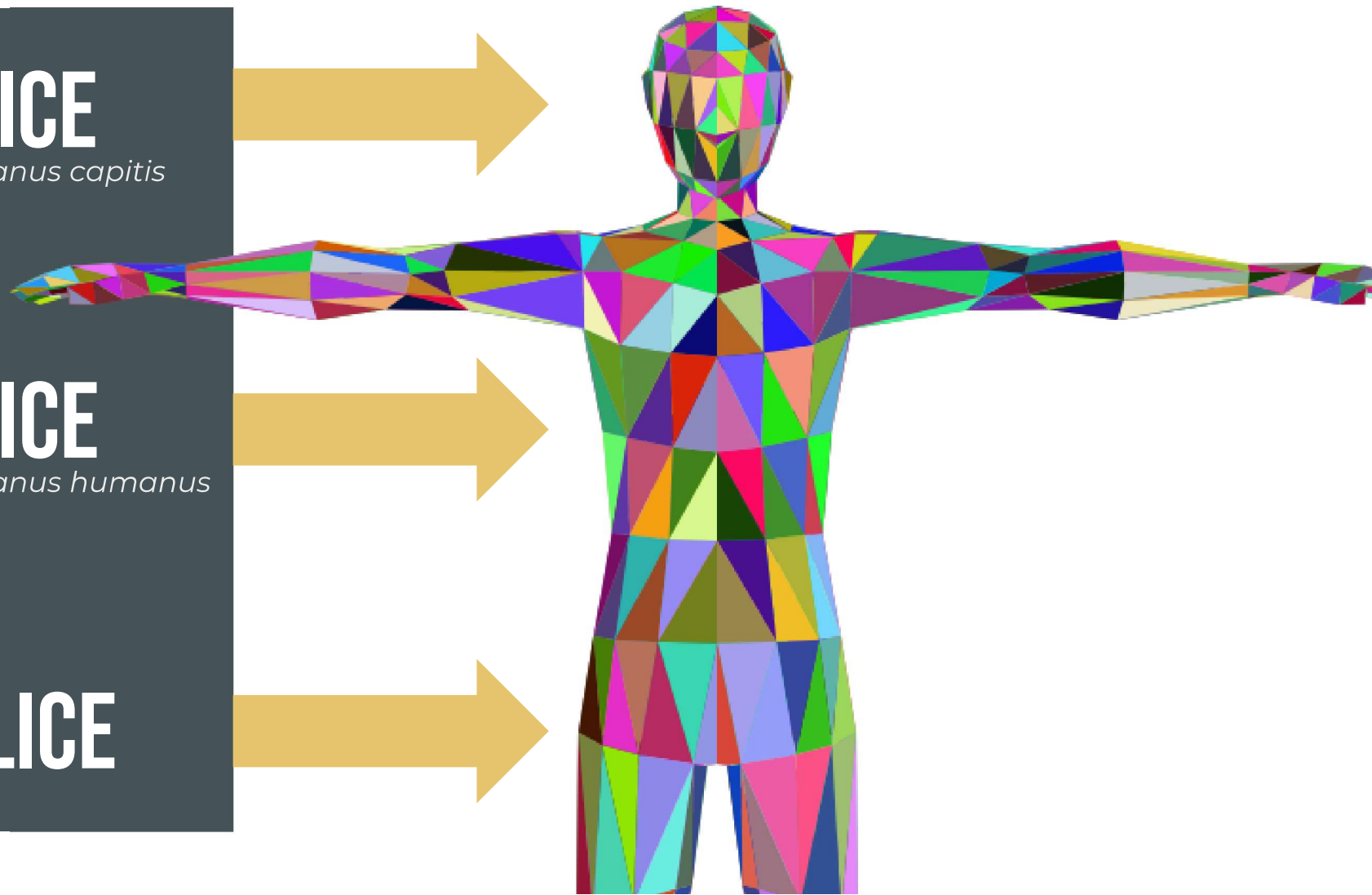
Pediculus humanus capitis

BODY LICE

Pediculus humanus humanus

PUBIC LICE

Pthirus pubis



HUMAN LICE

HEAD LICE



Habitat

- Scalp hair

Bite

(& feed on human blood)



Diseases transmitted

- **None***

BODY LICE



- Clothes & bedding



- **Epidemic typhus**
- **Trench fever**
- **Relapsing fever**

PUBIC LICE



- Pubic/perineal hair
- Facial, body, and scalp hair



- **None**

HEAD LICE IN THE U.S.

Most common in
children 3-11 years
in age.

~6-12 million
cases per year in the
U.S.



HEAD LICE SPREAD BY CRAWLING

DIRECTLY

- Contact with affected head



INDIRECTLY

- Shared personal belongings



HEAD LICE SPREAD BY CRAWLING

DIRECTLY

- Contact with affected head
 - Hugging
 - Posing for photos
 - Sharing a direct sleeping space
 - Soothing

INDIRECTLY

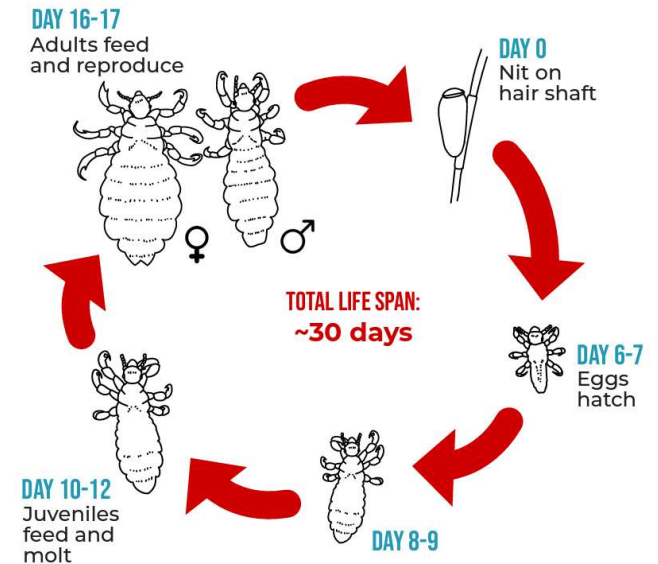
- Personal belongings
 - Hats, coats, scarves
 - Headphones
 - Helmets
 - Brushes
 - Pillows
 - Wigs, costumes, stuffed animals



Nits (eggs) are glued to the hair shaft near the scalp.

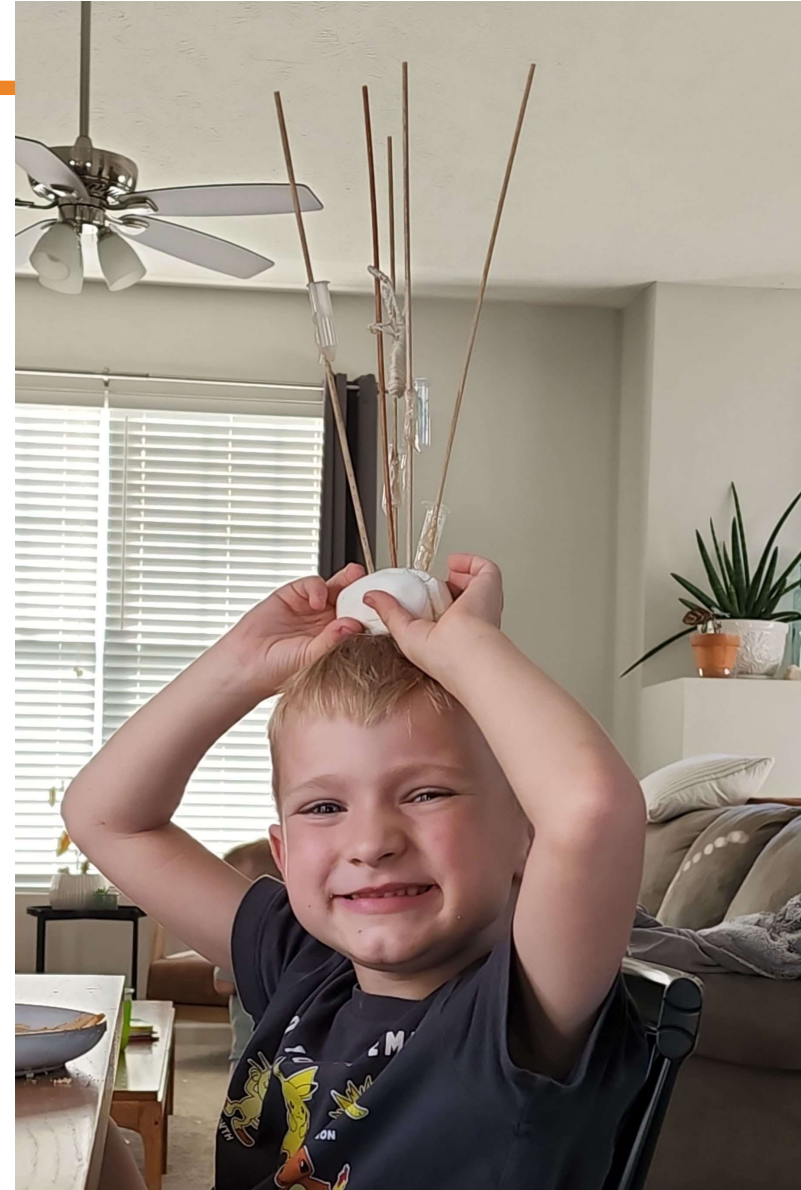
INDIRECT TRANSMISSION OF HEAD LICE IS MUCH LESS COMMON

- Head lice depend on people for warmth, humidity, and meals
- Lice die within a couple of days off a host
- Lice eggs cannot hatch when more than **1 cm** from a scalp



"ACTIVE INFESTATIONS"

- Live adult or nymph lice are found
- **Symptoms or nits alone may not be active infestation**
- Nits do not come off hair shaft, even after they have hatched



ALWAYS BEGIN WITH AN INSPECTION



Photo: J. Green



Photo: K. Chapman



Photo: J. Green

TREATING FOR HEAD LICE

REMOVING HAIR

- Cutting hair
- Shaving

Not always the best option

MANUAL REMOVAL

- Wet combing

Effective but time consuming

PEDICULICIDES

- Shampoos
- Creams
- Ointments
- Lotions

May also need to comb

COMMON PEDICULICIDES



BRAND NAME	ACTIVE INGREDIENT	MINIMUM AGE	NEED TO COMB	SECOND TREATMENT	AVAILABILITY
Nix®	Permethrin, 1%	2 months	Yes	As needed	Over the counter
Rid®	Pyrethrins, 33%	2 years	Yes	Required	Over the counter
Ulesfia®	Benzyl alcohol, 5%	6 months	Not required	Required	Prescription
Sklice®	Ivermectin, 0.5%	6 months	Yes	No	Prescription
Ovide®	Malathion, 0.5%	6 years	Not required	As needed	Prescription
Natroba®	Spinosad, 0.9%	4 years	Not required	As needed	Prescription
Lice-Freee®	Natrum muriaticum 1X HPUS, 10%	6 months	Not required	As needed	Over the counter

TREATING FOR HEAD LICE

- ✓ Everyone should be inspected first
- ✓ Treat **only** those with active infestations
- ✓ Everyone should be treated **at the same time**
- ✓ The environment / facility should be cleaned **within the same time frame as treatment**

Pesticides used to kill head lice on objects or within the learning environment (classroom) are **unnecessary** and **never warranted**.



Soak **hair brushes, combs, ponytail holders, and hair clips** in hot water (130 °F) for 5-10 minutes.



Hats and stuffed animals can be heated in a dryer on high heat for 30 minutes.*



Launder all **clothing and bedding** in hot water. Dry on high heat.*



Headphones and helmets can be placed into sealed plastic bags and frozen for at least 10 hours.



Vacuum **car seats, upholstery, and carpets.**



REMINDER

Only treat items that were in contact with an affected head **24-48 hours** prior.

*Be aware some fabrics and items are not suitable for high heat.

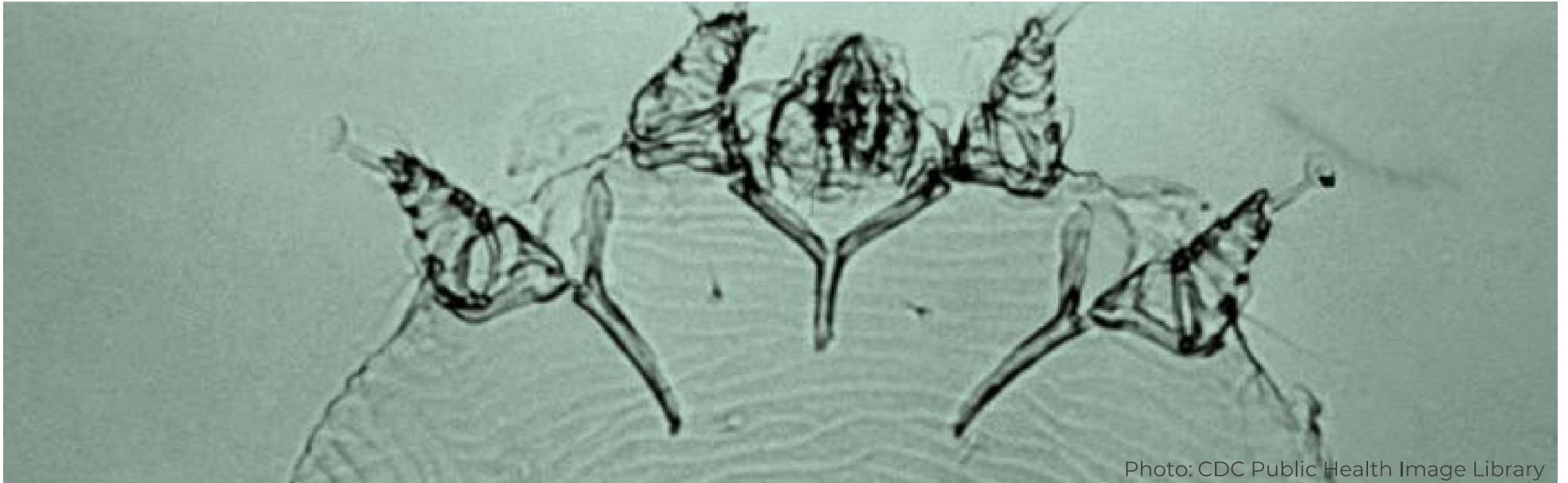


Photo: CDC Public Health Image Library

SCABIES

Sarcoptes scabiei

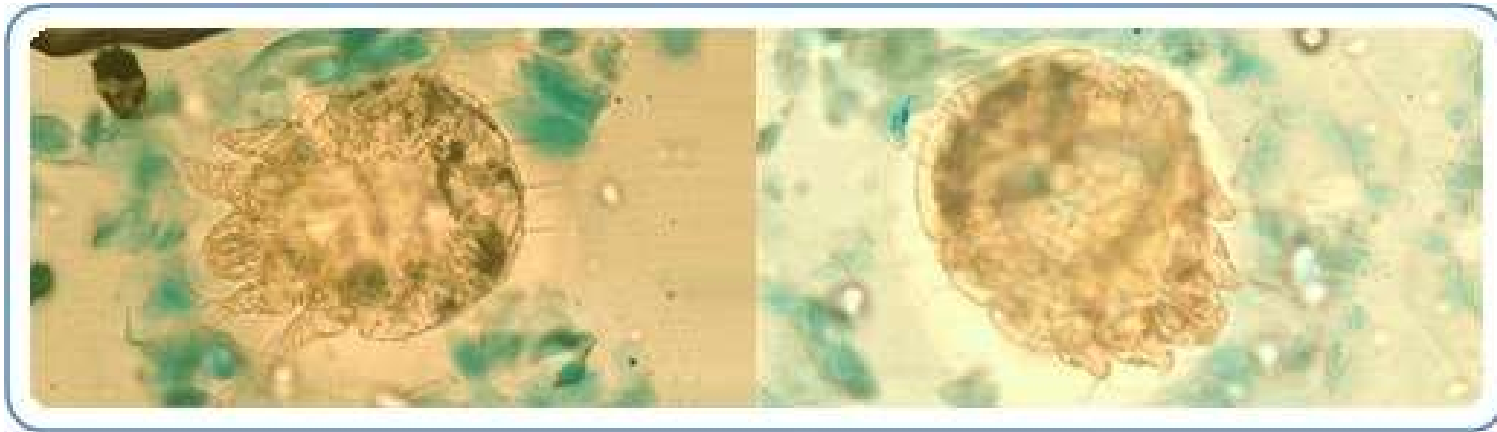
SCABIES

- Affect more than 200 million people worldwide
- Outbreaks most common in nursing homes, prisons, or childcare facilities
- Prevalent in children and older people
 - Increased exposure
 - Softer skin
 - Lack of immunity
 - Reduced mobility

Photo: CDPH



SCABIES ARE MICROSCOPIC SKIN MITES



- Burrow into upper layer of skin
- Usually fewer than 10 to 15 mites per person
- Lifespan 1 to 2 months (24 to 40 days) on a person

THE SCABIES LIFE CYCLE

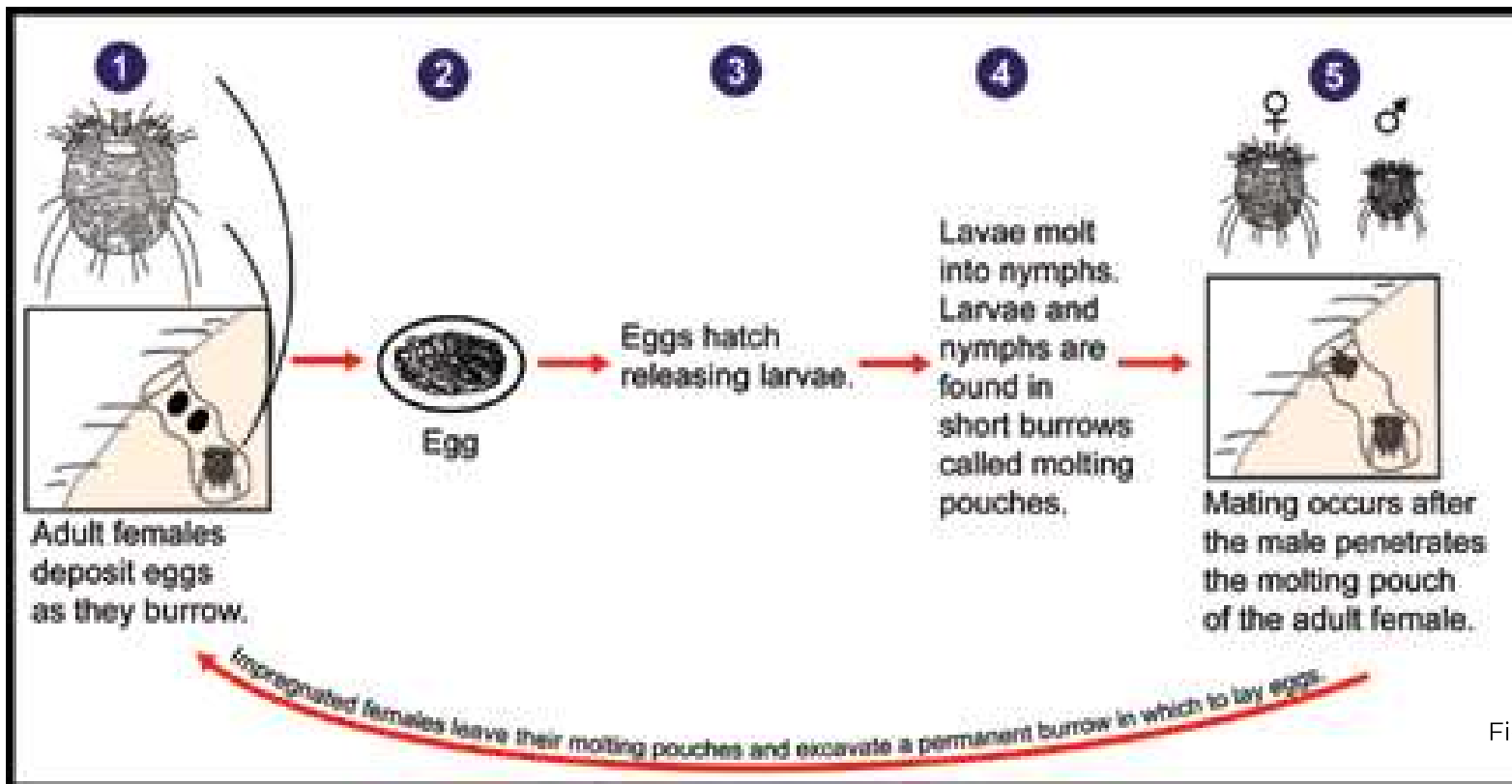


Figure: CDC

Transmission primarily occurs through direct skin-to-skin contact

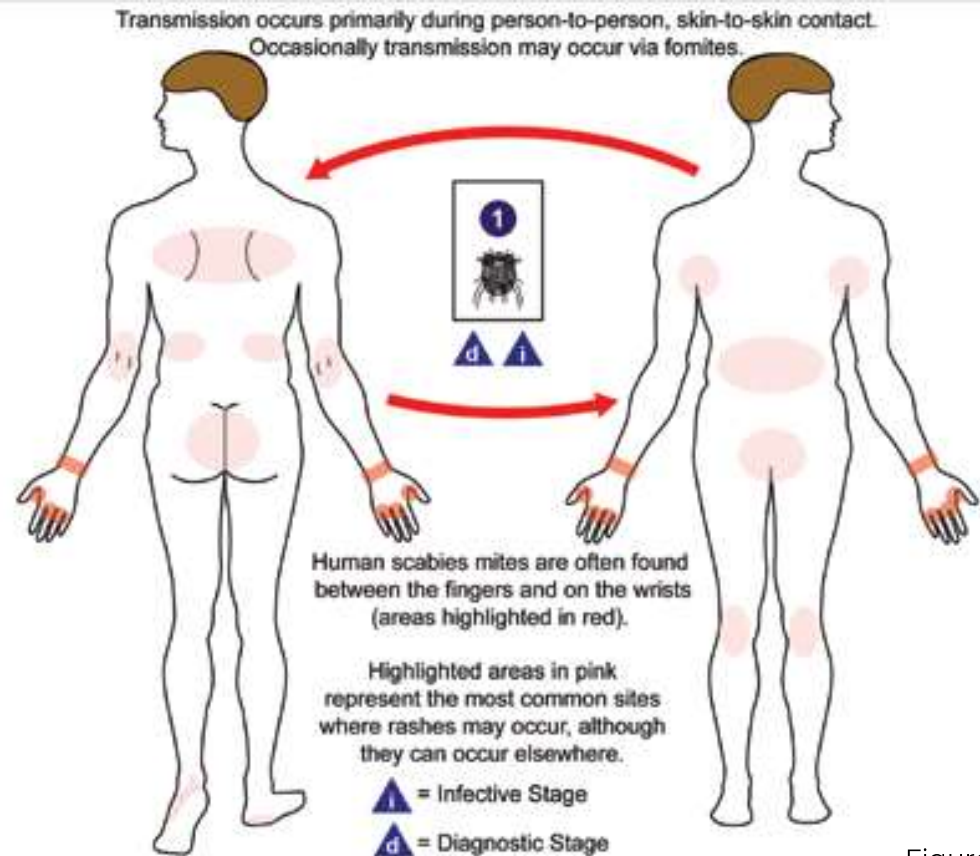
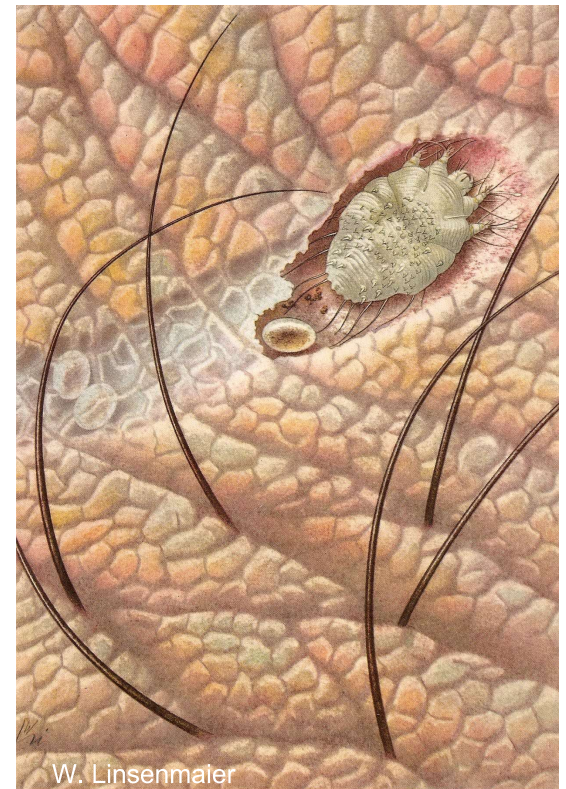
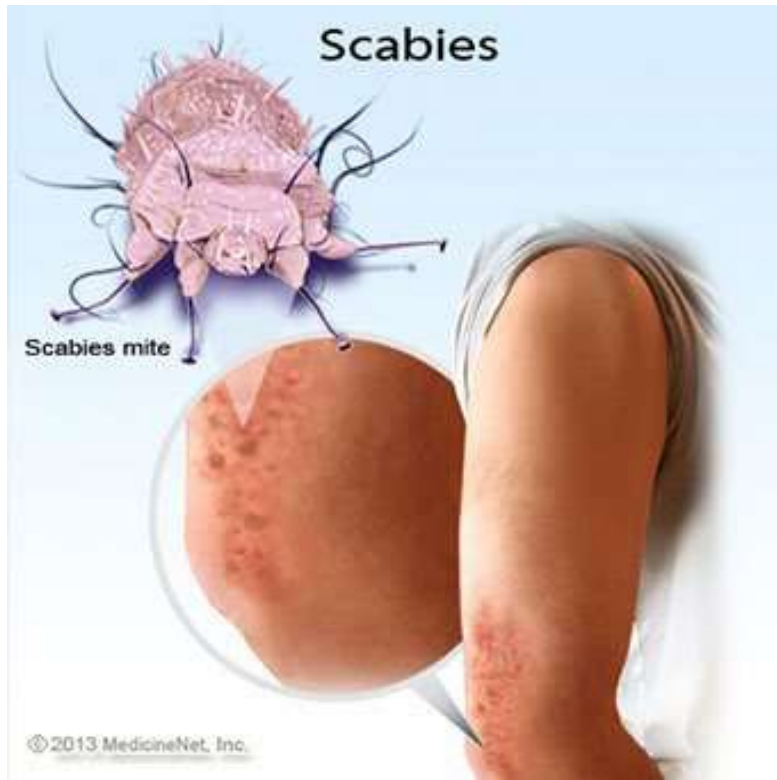


Figure: CDC

Symptoms of scabies appear 4 to 8 weeks after exposure and includes intense itching, especially at night



Physicians can diagnose skin symptoms of mites, eggs, or fecal matter from skin scrapings



- Tiny burrows look like raised, crooked lines on skin surface
- Parts of body include webbing of fingers, wrist, elbow, knee
- For infants: Head, face, neck, palms and soles of feet

CRUSTED (NORWEGIAN) SCABIES

- A severe form of scabies that is extremely contagious
- Up to 2 million mites may be colonizing the skin



SCABIES TREATMENTS



Permethrin cream
ivermectin



lindane lotion



sulfur ointment



crotamiton lotion



oral

- Can take 2 to 4 weeks to heal
- Treat others in household who have direct, prolonged contact
- Launder clothing, bedding, and towels in hot water
 - Lethal temp 122°F/50°C for 10 minutes
- Cannot survive if off the host for 48 to 72 hours



POLICIES & PROCEDURES

For “Bugs” in Healthcare

POLICIES & PROCEDURES

FOR “BUGS” IN HEALTHCARE

- Bed bugs, lice, and scabies shall be mitigated and controlled upon identification. Upon identification, workforce member will implement established processes as indicated...

Harbor-UCLA Medical Center, County of Los Angeles,
Department of Health Services

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POLICIES & PROCEDURES

FOR “BUGS” IN HEALTHCARE

1. Collect & identify specimens
2. Notify appropriate persons
 - Patient’s primary MD
 - Infection Prevention & Control
3. Patient management
4. Environmental management

PATIENT MANAGEMENT

- Only allow necessary personal items
- Place patients in **Contact Precaution** (if necessary)
- Isolate & bag patient belongings
- Educate & advise

Source: 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, Centers for Disease Control and prevention

HEAD LICE



Type of precaution

Duration of precaution

Precautions

Contact + Standard

Until 24 hours after initiation of effective therapy

- Avoid direct head-to-head contact

BODY LICE



Standard

n/a

- Wear gown and gloves when removing clothing
- Bag and wash clothing on high heat

PUBIC LICE



Standard

n/a

SCABIES

- **Type of precaution:** Contact + standard
- **Duration of precaution:** Until 24 hours after initiation of effective therapy

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ENVIRONMENTAL MANAGEMENT

- Head lice do not survive for long off of the scalp (24-48 hours)
- Continue with regular cleaning routines
- Cases of crusted scabies may need extra precautions

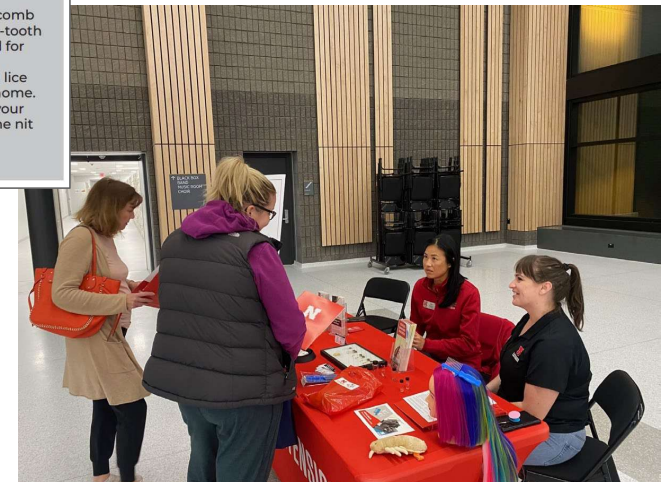
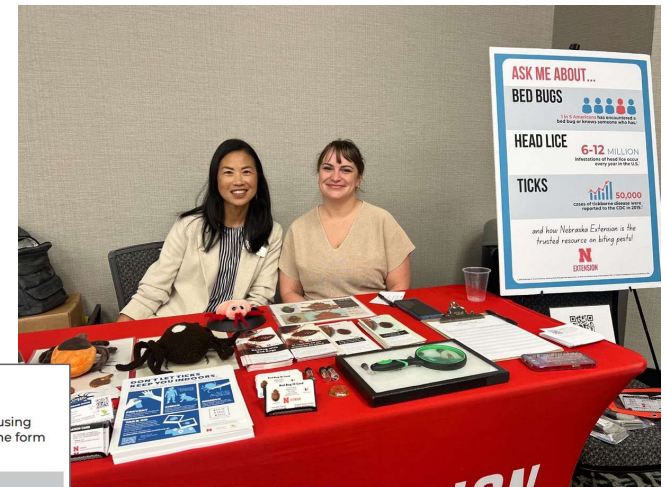
PATIENT EDUCATION IS A KEY COMPONENT

What was found; what needs to be done



EDUCATIONAL RESOURCES

- CDC
- Nebraska Extension
 - Diagnostic consultations
 - Management guidance for patients



THANK YOU

Kait Chapman

Kchapman13@unl.edu

Lancaster.unl.edu/bedbugs

