

# PEDICULOSIS

## REPORTING INFORMATION

- Class C
- Report when epidemic is suspected
- Report by telephone

## AGENTS

*Pediculus humanus capitis* - Head Louse. *Pediculus humanus corporis* - Body Louse. *Pthirus pubis* - Pubic or Crab Louse.

## CASE DEFINITION

The current edition of the CDC's "Case Definitions for Infectious Conditions Under Public Health Surveillance" does not list a case definition for national surveillance of pediculosis. See "Signs and Symptoms" and "Diagnosis" below for reporting guidelines in Ohio.

## SIGNS AND SYMPTOMS

This is a moderately contagious infestation of humans.

**Head lice** infest people of all ages but are especially common on preschool and elementary school aged children. The adult head louse measures 2-4 mm long and is adapted to life on human hair and the scalp but is not found on eye brows, eye lashes or other parts of the body. They are generally yellowish white in color, but will appear to be grey or almost black when full of blood. Head lice are generally unable to survive on dry bedding, upholstered furniture or carpets for more than 24 hours. The female louse attaches her eggs (called nits) to hair shafts close to the scalp with a waterproof, glue-like substance. Nits are also pale colored, but will become dark if the embryo dies, or will be transparent after the louse emerges. These nits appear as evidence of infestation. Itching is a manifestation of the feeding process and is the major symptom. People with light infestations might not experience symptoms, therefore itching should not be relied upon as a definitive diagnostic sign. A thorough examination of the head will reveal the telltale yellowish to white nits. Head lice do not transmit diseases. Responsibility for the control of head lice falls on parents or guardians, not the school. Children can become infested at school but the lice come from other children, not the school itself.

**Body lice** are generally found only in human populations with extremely poor hygiene. The lice hide in the seams of clothing, getting on the infested person's skin to feed only at intervals, generally in areas of the body where clothing is in close proximity to the body, such as the waist, arm pits, and groin. A small pinpoint red macular or papular dermatitis with a central punctum or urticarial wheal is the characteristic lesion of body louse infestations. Elimination of lice and their eggs can be achieved through 1) removal of lice from the body; 2) thorough cleaning of infested clothing and bedding by a) laundering in hot water followed by the hot dry cycle of the dryer or b) dry cleaning; and 3) thorough bathing of the infested person. Body lice have been implicated in the transmission of diseases such as trench fever, epidemic (louse-borne) typhus, and relapsing fever.

Under the microscope, **pubic lice** resemble small crabs which live in the ocean; hence, the terms "crab lice" and "crabs" are frequently used to refer to an infestation. All age groups can be infested, although sexually active people are most often infested. Although not always present, a characteristic bluish or slate-colored grouping of lesions on the trunk, thighs and upper arms is common. These are called maculae caeruleae or "sky-blue spots." Pubic lice can also infest other coarsely haired parts of the body, such as eye lashes, eye brows, facial hair, and body hair. They are transmitted from one person to another by direct, usually sexual, contact. Infestations in children is not an indication of abuse. Fomites (inanimate objects) usually play little or no role in transmission. Pubic lice do not transmit any diseases.

## DIAGNOSIS

Definitive diagnosis of lice is made by identifying the lice or nits.

Diagnosis of **head lice** requires a thorough and careful examination of the hair and scalp. Nits are

commonly found on the hairs at the nape of the neck and behind the ears where they are protected from extremes of light and temperature, but they can be deposited anywhere on the scalp and the entire head should be examined. Live adult and nymphal lice are difficult to find, as they move quickly and hide well. They do not jump or fly.

The method of examination is not standardized; however, the use of a wooden applicator stick, tongue blade or comb (even the nit combs often supplied with louse control products) will prove helpful to some. Gloves may be worn during examinations. Hand washing immediately after examination is important to prevent transmission of diseases of the scalp, such as ringworm, or transmission of lice to the next person to be examined. Alcohol wipes or swabs are not effective against lice or nits. **Transmission of head lice by the hands of the examiner has never been documented.** Identification of a nit can be facilitated by using a magnifying glass or microscope.

Starting at the scalp, hair should be examined by moving the comb or other device up the hair shaft. Live lice will rarely be found during examinations. Nits are more numerous and are stationary, making them easier to find. It is important to distinguish a nit from dandruff, hair spray globules, irregularities in the hair shaft, or "hair casts." A nit is firmly cemented to the hair shaft and will not be removed easily.

A single louse or nit found on the scalp is enough to indicate infestation and warrants immediate treatment. While even an experienced examiner might find only a few adult lice on the scalp, there can be many more smaller nymphs present.

Refer to "Signs and Symptoms" for diagnosis of body and pubic lice.

## **EPIDEMIOLOGY**

### **Source**

Humans are the only hosts for these lice; they do not infest dogs, cats, or other animals or inanimate objects such as furniture, mattresses, bedding, or carpets.

### **Occurrence**

Endemic worldwide. Head louse infestations occur regardless of age, sex, socioeconomic status, or ethnic background. They are most often found in schools and child care settings, where outbreaks are common. In the U.S., black persons are less commonly infested than whites.

### **Mode of Transmission**

Direct - Person-to-person contact is responsible for most louse infestations. Lice cannot jump or fly. However, they can move quickly when warm and well fed.

Indirect - In addition to having a great deal of physical contact with others, school children tend to share lice carrying objects (fomites) more than other age groups. Head lice have no biologic urge to explore the fabric world and cannot survive off the host for longer than 24-48 hours (under ideal conditions of 72° F or higher and high humidity). Transmission from one head to another is possible via fomites soon after infestation of the object. The list of objects that can contribute to lice transfer includes:

- Brushes
- Upholstered Furniture
- Pillows and Cushions
- Clothing
- Carpeting
- Hats and Scarves
- Combs
- Towels and Bed Linens
- Stuffed animals, dolls, cloth-covered toys
- Costumes and Masks

Although the degree to which fomites contribute to infestations is not clear, it is believed that they might become more important in transmission as the intensity of infestation in a community increases. Fomites might play a more important role in warmer climates or homes occupied by heavily infested people.

Both head-to-head and indirect transfer account for the high percentage of intra-familial infestations. The opportunities for physical contact; the sharing of towels, brushes, and clothing; and the use of the same furniture by all family members are responsible for the high incidence of transmission. Bed sharing and holding small children should also be considered high risk factors.

#### **Period of Communicability**

Transmission is possible immediately after infestation through completion of the initial shampoo treatment, or as long as live lice and nits remain. Unhatched eggs will not survive or hatch below 72° F and are destroyed when removed manually.

#### **Incubation Period**

Incubation of the egg takes 7-10 days. Sexual maturity is reached in 8-10 days. A mature female louse can lay 3-10 eggs per day. The life span of an adult louse is about 30 days.

### **PUBLIC HEALTH MANAGEMENT**

#### **Case**

#### Treatment

Treatment should be initiated as soon as nits and/or lice are found. Proper management involves not only treating the individual, but examining anyone to whom lice may have spread and treating those that are infested, and treating or initiating a two week isolation of all fomites with which the infested person had contact.

**Step One:** The first step is to **treat the infested individual** by applying a medication that will kill lice and nits. An effective pediculicide kills all lice and as many eggs as possible. It should also have residual action so that any nymphs that hatch after treatment will also die. Children less than 2 years old should never be treated with pediculicides; lice and nits should be removed by hand.

The prescription and non-prescription pediculicides available in the U.S. fall into three categories: lindane preparations; synergized natural pyrethrins; and synthetic pyrethroids. All types can be used effectively. Directions for use accompany each product. It is essential that the manufacturer's instructions for treatment are followed exactly.

#### LINDANE PREPARATIONS (Kwell, Kwellada)

- Effective but slow acting, requiring up to three hours per treatment.
- Ovicidal (nit killing) activity is 45%-70% effective.
- There is no residual activity.
- There is greater toxicity potential, especially if over-used.
- Prescription by physician is required.

#### SYNERGIZED NATURAL PYRETHRINS (Rid, R&C Shampoo, A-200 Pyrinat, Triple X, Barc)

- Effective and fast, requiring 10 minute treatment.
- Ovicidal (nit killing) activity is 70%-80% effective.
- There is no residual activity.
- There is a potential reaction to product in ragweed-sensitive individuals.
- The product is relatively unstable in heat and light.
- Over-the-counter product, no prescription required.

#### SYNTHETIC PYRETHROIDS (Nix, permethrin)

- Effective and fast, requiring 10-15 minute treatment.
- Ovicidal (nit killing) activity is 70%-80% effective.
- Residual activity lasting about 10 days.

- Possible itching or transient rash as side effects.
- Heat and light stable.
- Over-the-counter, no prescription necessary.

**MALATHION PREPARATIONS** (Ovide - new product, availability not known)

- Effective but slow acting, requiring 8 to 12 hours per treatment.
- Ovicidal (nit killing) effectiveness is 95%.
- There is no known residual activity.
- There is some toxicity potential, especially if overused.
- Prescription by physician is required.

Regardless of the pediculicide used, the patient should be retreated 7-10 days after the initial treatment.

Follow-up care includes checking for nits and lice for 14 days post-retreatment. There may be no problem readmitting children to school following the first treatment for head lice, even if nits remain. A nit-free policy can be a good tool for surveillance and assurance of compliance.

However, if adopted, it should be flexible and selective, taking into consideration the following:

1. Reliability of the parents or guardians in administering the treatment correctly.
2. The pediculicide used (see details above).
3. Size and duration of the outbreak, whether it is a repeat of a previous one, or is a persistent one.
4. Whether the case is a reinfestation of a previously treated individual.
5. Since it is difficult to enforce or comply with a nit-free policy, the following might be considered:
  - a. An extended compliance period (3-7 days).
  - b. Enforcement only for repeat cases.
  - c. Enforcement only for those with nits present at the 14-day post-treatment examination.

A nit-free policy should not result in children losing time from school. In cases where children are experiencing persistent or repeated infestations, careful attention should be given to Step 2 that follows. Special attention may have to be given to a select few individuals by applying medication (with the parents' permission) at school, supervision of treatment in the home, or eliciting the help of other agencies.

**Step Two:** The second step is to **examine all contacts** to whom lice might have spread and treat those that are infested. All household members should be examined - adults as well as children. In addition, anyone with whom the infested person had recent physical contact or possibly shared lice-carrying fomites - classmates, playmates, and baby-sitters in the case of infested children, and co-workers and acquaintances in the case of adults - should be notified and examined. If they are found to have lice or nits, their families and other contacts should be notified, and so on. It is only by attempting to eliminate the entire chain of transmission that the cycle of infestation and reinfestation can be broken.

**Step Three:** The third step is **environmental control** by thoroughly cleaning bedding and all objects contacted by the infested individual in the 48-hour period before the initial treatment. Effective disinfection can be achieved by vacuuming, machine washing, machine drying, dry cleaning, ironing, freezing, or storing fomites in tightly sealed plastic bags for two weeks. The following recommendations are based on the fact that temperatures of 125° F or higher are lethal to lice and nits:

- Floors, rugs, pillows, and upholstered furniture should be thoroughly vacuumed.
- All clothing, linen, and cloth toys that the infested person might have worn or handled in the 48 hours before diagnosis should be machine washed in hot water (125°F) or placed in a freezer overnight.

- Items that cannot be machine washed but can be machine dried should be dried at the hottest setting for at least 20 minutes.
- Other items may be dry-cleaned, carefully vacuumed, placed in a freezer overnight, or sealed in plastic bags for two weeks.
- Combs and brushes should be soaked in hot water (125°F) for one hour.

***Spraying classrooms or homes with insecticides is not recommended for cases of head louse infestation.***

#### Isolation

The Ohio Administrative Code ([OAC 3701-3-13 \[R\]](#)) states that "a person with body lice shall be excluded from school or child care center until twenty-four hours after application of an effective pediculicide. A person with head lice shall be excluded from school or child care center until after the first treatment with an appropriate pediculicide".

#### **Prevention and Control**

The real key to controlling pediculosis is [prevention](#), i.e., containing the problem before it can spread. Prevention involves education to avoid habits that spread lice, education of parents of school-aged children to check regularly for lice or nits, education of school personnel to check students for lice and nits and to minimize opportunities for sharing of fomites, and education of the community in general about the control of pediculosis.

In the United States, the majority of school outbreaks of pediculosis occur in fall and winter. This probably results from the increase in head louse populations during the ideal conditions of summer warmth and humidity. September has been declared "Pediculosis Prevention Month." It is suggested that one of three annual school-wide screenings for pediculosis be held in the first week children return to school after summer vacation. The other two screenings, in the week following Christmas vacation and in the last week of school, should be supplemented by regular spot checks throughout the year.

The school environment should be checked for potential means of louse transmission and changes recommended if necessary. Lockers and coat hooks should not be shared, and children should be taught not to exchange combs, brushes, clothing, or blankets and pillows. School property such as gym towels, athletic equipment, and costumes should not be passed from child to child unless they are properly cleaned. At the beginning of each school year, written information about head lice prevention can be sent to parents, describing what the school is doing to prevent infestation and suggesting what parents can do at home. School officials can also arrange for a presentation by local health professionals at a PTA meeting, etc.

If such preventive guidelines are followed at summer programs such as sleep-away camps and daytime programs, children will be more likely to enjoy a louse-free summer, and there will be less risk of infestation when they return to school in the fall.

A successful pediculosis prevention program requires cooperation among school staff, public officials, and health professionals to make information available to the public. Experience has shown that those facilities and institutions that develop, disseminate, and implement [specific policies](#) regarding head lice control are most successful in preventing protracted outbreaks and subduing the resentment and confusion that often accompanies this problem. The following information is presented to assist local health departments, school administrators, and school boards in working together to develop a policy and an effective control program. A [sample policy](#) appears at the end of this narrative; the points to address and the rationale for the policy appear on the subsequent pages.

#### **SPECIAL INFORMATION**

Written material and videotapes are available from the ODH. The videos available are: *Advice on Lice* and *Facts of Lice*. The videos may be reserved by calling the ODH Division of Health Promotion and Education at (614) 466-4626. Information and help may be obtained by contacting the Vector-borne

Disease Program, ODH at (614) 752-1029 or the Infectious Disease Section at (614) 466-0265.