



ARKANSAS HEAD LICE & BED BUGS MANUAL



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Preface

The purpose of this manual is to provide information about the identification and treatment of head lice and bed bug infestations. Throughout the State of Arkansas, this information will guide health departments, healthcare providers, childcare and school facilities, and parents.

Acknowledgments

Thank you to the Tennessee Department of Health. This material was adapted with permission from the 2022 Tennessee Head Lice Manual for use by the State of Arkansas.

Head Lice

The head louse (*Pediculus humanus capitis*) is most commonly found on the scalp of school-aged children and their immediate family members. An estimated 6-12 million cases of head lice infestations occur annually in the United States among children 3-11 years of age. The most common way of contracting head lice is close head-to-head contact.¹ This is often the result of infested children playing together or people living in overcrowded facilities.^{2,7} The criteria for diagnosis of a head lice infestation (pediculosis) are the presence of live head lice found on an individual's scalp.

A head lice infestation is not considered a health hazard, as head lice are not known to spread disease. During the initial stages of a head lice infestation, individuals may not experience any symptoms.³ Some have reported a 4–6-week delay in symptom development.⁴ As the infestation progresses, individuals may report intense itching of the scalp, which could lead to sleeplessness and irritability. There are available treatments to successfully eliminate a head lice infestation. Excluding children from school is not a recommended form of prevention.



Figure A: Male human head louse. Photo credit to Giles San Martin, CC-BY-S

Human Health and Head Lice

Head lice infestations are not considered a health hazard, as head lice are not known to spread disease.

Although head lice are not known to spread disease, social stigma may result causing embarrassment, assumptions about personal hygiene, and shame for an individual. Head lice are not necessarily a product of poverty or certain living conditions; anyone can be affected by a head lice infestation.

Head lice pose a substantial economic burden. The annual combined direct cost (medicines, products, and treatments) of head lice infestations in the United States (US) total \$240 million. Once indirect costs (missed work and school days, misuse of treatments, misdiagnosis) are considered, the US economic burden of head lice surpasses \$1 billion.⁸ In many areas of the world, head lice are a serious public health issue, with an increasing prevalence of infestations.⁵

The head lice policies in many childcare and educational facilities, known as “no-nit” policies, are not effective at reducing the prevalence of head lice in schools and result in unnecessary absenteeism. By increasing awareness of head lice prevention and treatment and decreasing associated stigmas, schools can more effectively prevent and eliminate head lice infestations.

Biology of Head Lice

Head Lice can crawl from one head to another but are unable to jump or fly.

The head louse progresses through three life stages: egg (nit), nymph, and adult.¹⁰

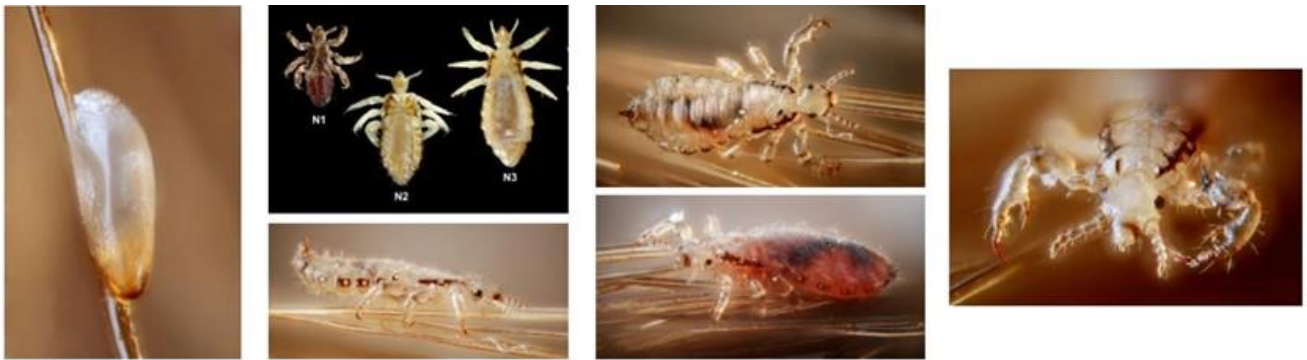
Eggs are roughly the size of a poppy seed, and firmly attach to the base of an individual hair shaft within $\frac{1}{4}$ inch of the scalp. This environment provides the optimal humidity and temperature for growth.

Nymphs can begin taking a blood meal shortly after hatching. The nymphal stage lasts 8-9 days and progresses through three substages.

Adult lice continue to take blood meals for nutrition and reproduction. They are 2-3 mm, about the size of a sesame seed, and live an average of 30 days. Females lay new eggs at a rate of 8-9 eggs per day near the base of a hair shaft. Most individuals will have an average infestation of 10-20 crawling lice.



A timeline and visual representation of the three stages of a head louse.



The developmental timeline of head lice. An egg hatches between 5-9 days, the nymph takes 7 days to mature, and adults an average of 30 days to mature. Photo credit to Giles San Martin, CC-BY-SA

Inspection and Diagnosis of Head Lice

Mass screenings decrease the accuracy of diagnosis and lead to social stigma.

Inspection of a possible lice infestation requires manual detection of crawling lice by using a bright light source, a magnifying tool, disposable gloves, and a disposable hair parting tool (such as a lice comb). It is important to allow sufficient time for this process, as it may be tedious. Lice screening kits can be assembled ahead of time, as shown in the figure below. In group settings, such as schools and other childcare facilities, individuals suspected of having head lice should be examined by a trained professional. If more than one individual is being inspected, it is recommended to use separate or disposable tools. Mass screenings are not recommended as they decrease the accuracy of detection and may lead to social stigma.³

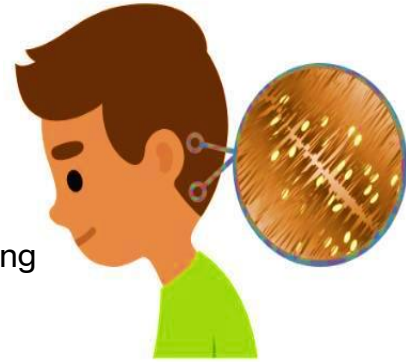
Head Lice Detection Kit



Tools for detecting a head lice infestation

Steps to Inspect and Diagnose Head Lice

1. Use a lice comb, or hair parting tool to examine the scalp by parting hair near the nape of the neck and behind the ears.
2. Use a bright light source to look for crawling lice (adult lice are about the size of a sesame seed) or lice eggs (about the size of a poppy seed, white to yellowish in color, and difficult to dislodge with a fine-toothed comb). If needed, use a magnifying instrument to get a closer look.
3. Proceed with the search throughout the hair line and rest of the scalp.
4. If crawling lice are identified, indicating a head lice infestation, seek treatment ([see section on Lice Treatment for more information](#)).
5. If crawling lice are not identified, but eggs are present:
 - a. Less than a $\frac{1}{4}$ inch from the scalp, consider a second inspection or asking for a second opinion.
 - b. More than $\frac{1}{4}$ inch from the scalp, this may indicate an older infestation. Discuss with a healthcare provider to ensure there is not an ongoing infestation.



A close-up of head lice eggs near the nape of the neck and behind the ears

Other Considerations

Head lice eggs are about the size of a poppy seed, often mistaken for dandruff, eczema, hair product buildup, or other scalp conditions. A louse egg is attached to an individual hair with a cement-like glue; it takes significantly more effort to remove than dandruff or hair product buildup. Unhatched eggs are found closer to the base of the hair shaft, often within a $\frac{1}{4}$ inch of the scalp, and are especially common behind and above the ears as well as at the nape of the neck.³

Risk Factors for a Head Lice Infestation

Head lice infestations are less common than the cold, flu, strep throat, ear infections, or pink eye.

Head lice are spread through prolonged, direct head-to-head contact with someone who has head lice. Contact is often unintentional; for example, occurring at sleepovers or wrestling between children.^{1,3} Although less common, a head lice infestation *can* be the result of shared items such as:

- hats
- scarves
- coats
- hairbrushes
- headphones
- sports helmets
- pillows
- towels
- furniture
- stuffed toy animals

The claws of head lice have adapted to grip human hair. However, lice have difficulty attaching to plastics, synthetic leathers, and other hard, smooth, polished surfaces. Therefore, these items do not play a role in the spread of head lice. Additionally, pets cannot carry head lice, nor can head lice be spread to pets.

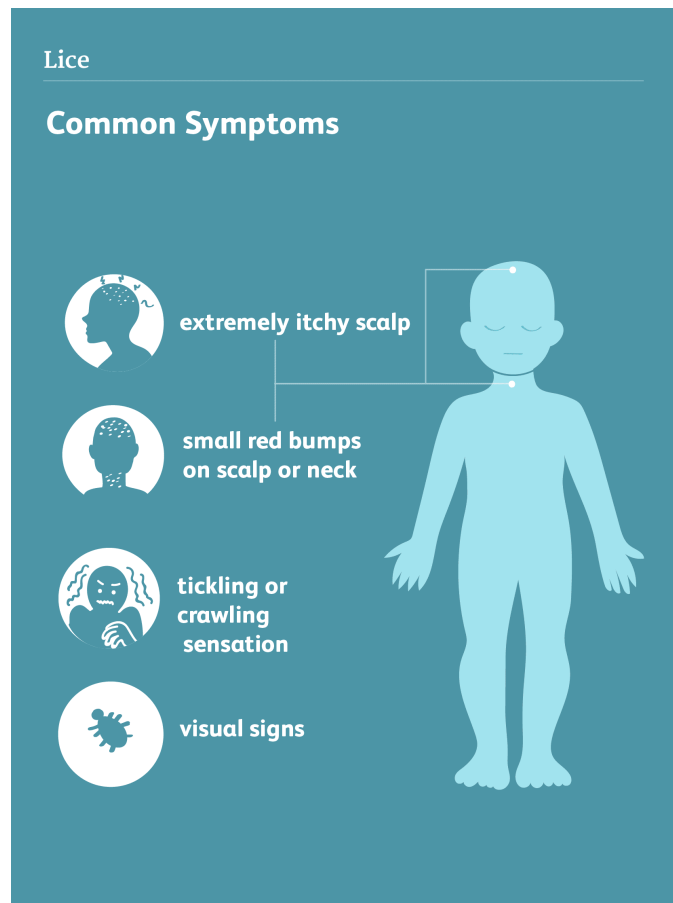
The best way to prevent a head lice infestation is to avoid direct head-to-head contact. Head lice infestations are less common than the cold, flu, strep throat, ear infections, or pink eye.³

Common Symptoms

During the initial stages of a lice infestation, individuals may not experience any symptoms at all. Additionally, symptoms may take 4-6 weeks to manifest while the lice population grows. As individuals may not complain about symptoms during early infestation, it is important to check for lice during this time following a potential exposure. The sooner lice are detected, the easier the infestation is to treat.

As the infestation progresses symptoms may include⁶

- intense itching of the scalp
- small red bumps on scalp or neck
- tickling or crawling sensation
- irritability and/or drowsiness due to lack of sleep
- sores on the scalp



Head Lice Treatment

Never initiate treatment unless there is a clear diagnosis of a head lice infestation.

Head lice are not known to transmit disease, but left untreated can cause hair loss, infection, and toxic shock syndrome.⁹

Never initiate treatment unless there is a clear diagnosis of a head lice infestation. To treat, use an over the counter or prescription topical product that specifically addresses lice infestations. There are many common, effective, and inexpensive treatments available. Shaving of hair or using alternative remedies such as tea tree oil, mayonnaise, olive oil, butter, or margarine is not recommended.³

Head Lice Treatment Products

Products used to eliminate lice infestations are called pediculicides. Refer to the [Comparison of Head Lice Treatment Products](#) table for a brief overview of available topical products. For a more comprehensive comparison and personalized recommendation, talk to your healthcare provider. Treat only those with active infestations or who share a bed with a person with an infestation.

The following actions are NOT recommended:

- combining treatment products
- deviating from the product instructions
- using more product than directed
- exceeding the recommended treatment duration
- using products not designed to treat head lice infestations
- re-treating excessively with the same product or re-treating sooner than directed

Comparison of Head Lice Treatment Products

Product	Common Brand(s)	Age Minimum	Kill Lice Eggs (Ovicidal)	Re-Treatment Approved
Over the Counter				
Permethrin lotion (1%)	Nix	2 months	No	Yes
Pyrethrin-based product	A-200, Pronto, Rid, R&C, Triple X	2 years	No	Yes
Prescription Required				
Benzyl alcohol lotion (5%)	Ulesfia	6 months	No	Yes
Ivermectin lotion (0.5%)	Sklice	6 months	No	Speak with physician first
Malathion lotion (0.5%)	Ovide	6 years	Partial	Yes
Spinosad topical suspension (0.9%)	Natroba	6 months	Yes	Yes

Carefully read and follow product instructions. If you have questions or concerns about a product, always consult a medical professional. Always rinse product out in the sink and use warm water. If pregnant, or breast feeding, please consult the product label or a health care professional before handling and using products.³

Re-treatment is only necessary if live lice are visible after the initial treatment is complete (refer to product instructions).³

If live lice are identified after initial treatment of Ivermectin (Sklice), consult the prescribing physician prior to re-treatment.³

Once a head lice infestation has been diagnosed and a treatment plan determined, consider the following:³

- Follow label instructions and physician guidance.
- Screen family members and close contacts for head lice over the next few weeks.
- Lice treatment products should only be used by those with an active lice infestation and anyone sharing a bed with an infested person.
- Use topical head lice treatment options in conjunction with manual removal for maximum effectiveness.
- Rinse out topical head lice treatment over a sink rather than a shower/bath to limit skin exposure.
- When rinsing out product, use warm rather than hot water.

Manual Removal of Head Lice

In conjunction with a topical treatment, a lice comb is a recommended method for removing head lice manually. An effective lice comb should:³

- be disposable or able to be submerged in hot water (at least 130F) for 5-10 minutes
- have small comb teeth to effectively remove eggs and adults
- only have narrow gaps between the comb teeth

Head Lice Comb



Steps to Manually Comb Lice

1. Follow product directions before manual combing.
2. Comb through hair in small sections.
3. After each comb-through, wipe the comb on a wet paper towel. Examine the scalp, comb, and paper towel carefully, making sure to dispose of any eggs or living lice.
4. Repeat steps 2 and 3 until all hair has been combed.
5. Treatment and manual combing may need to be repeated in 8-10 days. Follow product directions.

Chemical-Free Treatment Options

Lice Clinics of America is an organization that provides professional lice removal services, with 200+ clinics in the United States, including in and around the State of Arkansas. Without the use of chemicals, an FDA approved high-heat treatment kills lice and lice eggs in an hour. This alternative treatment takes the place of lice shampoo products and manual combing.

For more information, visit www.liceclinicsofamerica.com or call (855) 706-5423

After Head Lice Treatment

After a treatment has been successfully applied and hair combed with a lice comb, there should be no visible head lice adults or nymphs. (See the [Diagnosis of Head Lice](#) section for a reminder of how to effectively check for head lice.) Empty egg casings may still be visible for days or weeks following a successful treatment. Egg casings usually appear yellow, are farther (over $\frac{1}{4}$ inch) from the scalp and are not a cause for concern.

If crawling lice are noticed after 8-10 days, re-treat as needed with the appropriate product. Do not re-treat more than twice, as this may be an indication of pediculicide resistance (see the subsection [Pediculicide Resistance](#)); consult a healthcare provider if this occurs.

Causes of Head Lice Treatment Failure

Misdiagnosis of a head lice infestation

An active head lice infestation is diagnosed by detecting a crawling louse. The presence of eggs alone is not enough to diagnose an infestation, as empty egg casings may present days or weeks after the infestation has cleared. Eggs can be mistaken for dandruff, eczema, residue from hair products, knots, or tiny clumps of dead skin that encircle a hair shaft. To complicate things further, the symptoms of a head lice infestation may be due to other dermal conditions.³

Not following treatment instructions

Following product instructions is essential for eliminating head lice. Most products do not kill lice eggs, and manufacturers generally recommend re-treatment if crawling lice are still present after 8-10 days. A second treatment eliminates lice that emerged from eggs after the first treatment. **Overuse of a product, whether it is through increased treatment time or concentration of pediculicide, is not more effective in eliminating head lice, and can be harmful.**³

Pediculicide Resistance

Only use the recommended dosage for any lice treatment: increased contact time or concentration is not effective and may be harmful.

If crawling lice remain after re-treatment with a pediculicide, there is a chance the lice are resistant to treatment (sometimes referred to as “super lice”). Only use the recommended dosage for any lice treatment, as increased contact time or concentration of product will not eliminate pediculicide resistant head lice. Consult with a healthcare provider for steps to eliminate a “super lice” infestation.

Re-infestation

Monitoring family members and close contacts for head lice in the weeks following treatment may reduce the risk of being reinfested. Be sure to treat all infested individuals and bedmates *at the same time* and continue to take precautions to reduce head-to-head contact. For further information, refer to the section [Environmental Care and Decontamination](#).³

Environmental Care and Decontamination

Extensive environmental decontamination is not necessary after head lice are diagnosed.

Crawling head lice cannot survive off the scalp for more than 48 hours.¹² Certain environmental cleaning activities will help reduce the chance of becoming re-infested with head lice.

- Soak combs and brushes in hot water (at least 130F) for 5-10 minutes.
- Wash clothes, hats, bed linens, and towels in hot water (at least 130F) and dry on high heat for 30-40 minutes. Items that cannot be washed may be dry cleaned or sealed in a plastic bag for two weeks to ensure all eggs are dead.¹²
- Other cloth surfaces (cloth furniture, carpets, rugs, large pillows, and car seats) that may have been in direct head contact with someone with head lice should be vacuumed to remove any living or dead head lice and hair(s) that might have eggs attached.

Extensive environmental decontamination is not necessary after head lice infestation is diagnosed.

Pesticides

Pesticides are potentially hazardous to children. Pesticides should not be applied to the indoor environment for management of head lice. Do not spray pesticides in homes, schools, or other inhabited areas; pesticides can be toxic if inhaled or absorbed through the skin.³ Using pesticides incorrectly can result in serious health and safety risks.

School Policies

Students' emotional, social, academic well-being can be adversely affected when excluded from school due to a head lice infestation.

Head lice policies in childcare and educational facilities, known as “no-nit” policies, often cause unnecessary absenteeism, and fail to reduce prevalence in the community. Educating parents/guardians and school staff is recommended to eliminate common myths and stigma.³

Student emotional, social, and academic well-being can be adversely affected when excluded from school due to a head lice infestation. The Centers for Disease Control and Prevention and the National Association of School Nurses do **NOT** recommend the following practices:³

- exclusion of children from the classroom for head lice eggs (nits) or crawling lice
- classroom/mass-screenings
- notification to others except for parents/guardians of students with head lice infestations

Responding to Head Lice at School

Following an appropriate lice treatment, schools should not exclude students due to fear of active infestation or eggs. The affected student poses little risk of spread to others and should remain in class. School nurses should collaborate with clinicians to provide evidence-based treatment recommendations, ensure promotion of regular school attendance, and effectively manage head lice infestations.³

School Head Lice Protocols

If creating a protocol, consider the following:³

- Maintain the confidentiality of the student to avoid stigma and embarrassment.
- [Create clear guidelines on when, how, and who to notify if a student is diagnosed](#) with a head lice infestation. This may include identifying others who had head-to-head contact in the previous few weeks.
- There is no need to exclude a person from school who has been effectively treated for a head lice infestation.
- Mass screenings are no longer recommended because they lead to social stigma and decrease accuracy of detection.
- Create a detailed protocol for parents and staff regarding head lice if an infestation is detected.
- Create specific plans in case a parent or guardian is unable to successfully treat the head lice infestation.
- Determine how to discourage head-to-head contact to prevent the spread of a head lice infestation.
- Be prepared to answer questions from parents and guardians. Communication is key to understanding how to properly treat an infestation.
- It is essential to provide clear guidelines for school staff and parents/guardians on how to proceed with an identified head lice infestation.

Bed Bugs

The common bed bug is a small reddish-brown parasitic wingless insect. Bed bugs are not known to spread disease; however, their blood-sucking bites can cause an allergic or severe skin reaction. Visible bites on the skin may resemble those resulting from other insect bites, such as mosquitos, spiders, and fleas. Following a bite from a bed bug, some individuals are asymptomatic, making recognition of an infestation even more challenging.

Although bed bug infestations declined significantly during the mid-twentieth century, a recent increase has been noted. This can be attributed to extensive travel and difficult detection as well as difficult eradication. The bed bug's name results from their tendency to congregate and hide in the cracks of bed mattresses. Bed bug infestations can occur in a single residence or a public setting including but not limited to hotels and shelters.



An adult bed bug (*Cimex lectularius*) with the typical flattened oval shape

Bed bug management requires a collaborative public health approach to determine prevention best practices. The following sections serve as a guide for schools describing the effects of bed bugs on human health as well as detection and treatment options.

Human Health and Bed Bugs

Bed bugs carry social stigma and assumptions of filth and extreme poverty.

Proactive measures to prevent bed bug infestations are more effective and cost efficient than post-exposure treatment and eradication. These opportunistic nocturnal insects hide well within mattresses, furniture, and luggage. Once introduced into an environment, recognition of nighttime patterns of activity is essential to mitigate an infestation during early phases.

Although bites from bed bugs are not known to directly transmit blood-borne illnesses, their saliva proteins can cause allergic reactions, with subsequent exposures leading to more severe localized or systemic effects. Vulnerable populations, including young children and the elderly, may develop anemia during and after a bed bug infestation. Studies in Egypt have demonstrated an increased risk of reactions in populations that suffer from asthma.¹⁵

Much like head lice, bed bugs carry social stigma and assumptions of filth and extreme poverty. These ideas result in a false sense of security and insulation from potential exposure and infestation.

Biology of Bed Bugs

Once the nymph begins the feeding process, the nymph changes into a reddish-brown color.

Bedbugs belong to the *Cimicidae* insect family, specifically the *Hemiptera* order. A common characteristic of all Hemiptera is the ability to feed off of plant juices, other insects, and blood, through their ability to pierce the skin of animals and humans.



Female Bed Bug with round abdomen tip



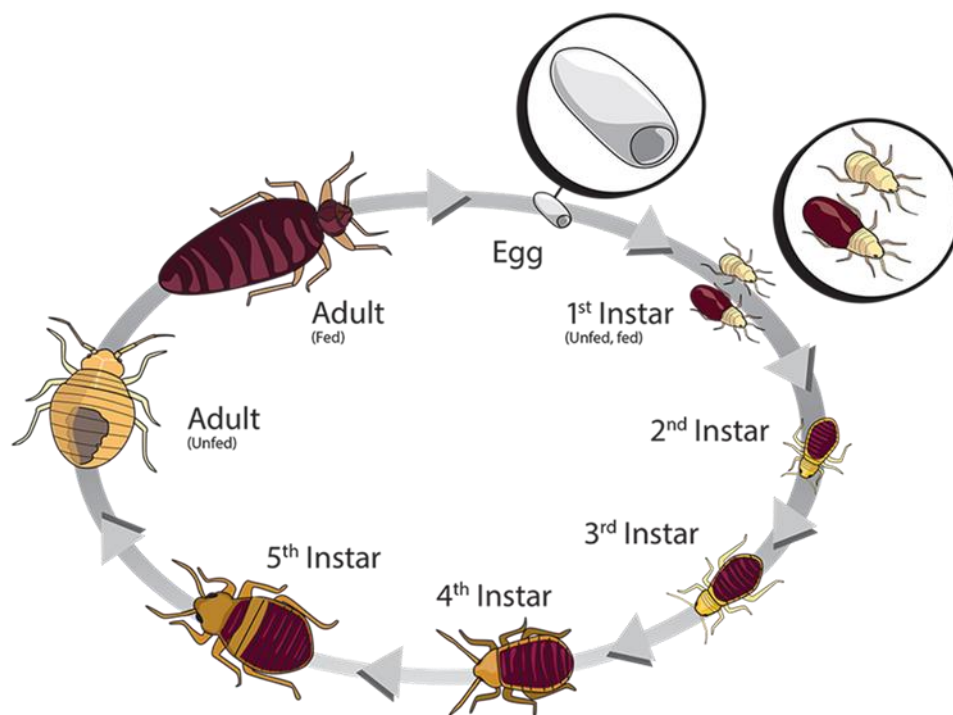
Male Bed Bug with pointed abdomen tip

Life Cycles of a Bed Bug

The **egg** stage begins the life cycle and takes place over 6-10 days. Female bed bugs lay between 1-5 eggs daily of which can be as small as two grains of salt. Size and translucent color make it very difficult to detect bed bug eggs and they may be clustered or solitary. Once the eggs hatch, a bed bug will immediately begin to feed. ¹⁶

Next is the **nymph** stage. After an egg hatches, the nymph begins to feed and develops a reddish-brown color. Nymphs complete 5 molting phases, shedding their old skin to make way for new growth.¹⁷ After doubling in size, the nymph begins to take on a more oval shape and adult appearance. The nymph stage can last from one to a few months depending on the environment.

Bed bugs reach full maturity at 10 weeks¹⁶ with the ability to survive for months without feeding. In the **adult** stage, they again shed their old skin to make way for new growth¹⁷. After completing this final stage, they begin to lay eggs and the bed bug cycle starts over again.

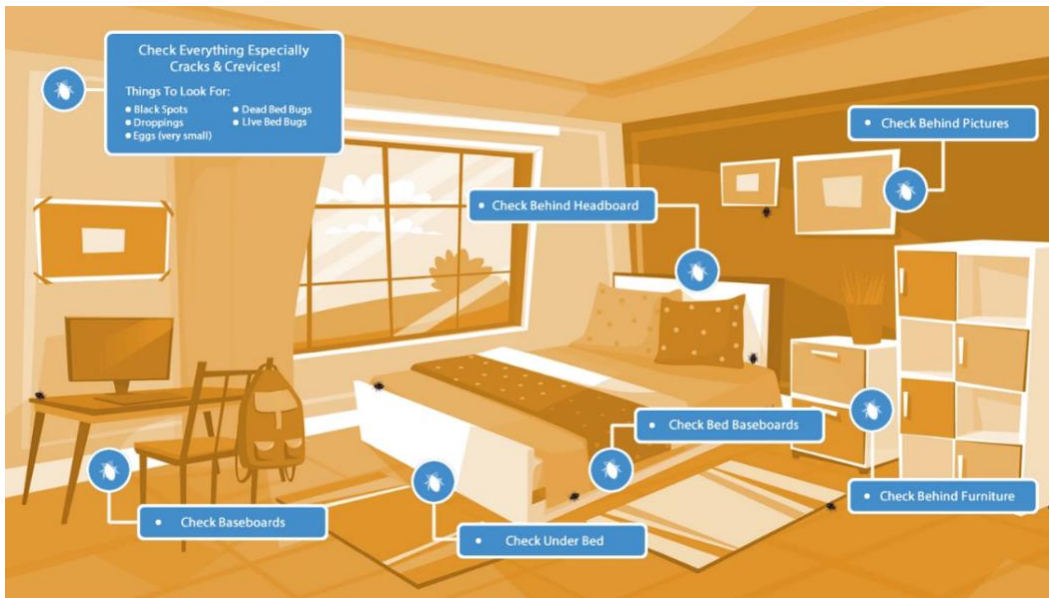


Life cycle stages of a bed bug. Note the translucent color transitions to a rusty red/brown after feeding.

Identification and Diagnosis of Bed Bugs

If there is any suspicion of being bitten at home, immediately inspect home for infestation of bed bugs.

Compared to other insects, bed bugs are extremely difficult to eradicate. Identification is the first step in prevention of a major infestation. Often, bed bugs are dismissed as carpet beetles, or other insects. It is important to be familiar with what a bed bug looks like, where they are usually found, and when they are typically active (at night).¹⁸ When bed bugs are not feeding, they tend to hide in various places. They are commonly found near mattresses, box springs, bed frames and headboards.¹⁹



Common areas for a bed bug infestation

How to Look for Bed Bugs

The search for and identification of bed bugs should begin in areas where people normally sleep. In addition to the techniques described below, double sided tape placed around and below furniture can be used as a monitoring tool for bed bug detection.

Utilization of a flashlight,²⁰ magnifying glass, and crevice tool can assist with inspections. Additionally, use of compressed air may be helpful to force bugs into visibility. Consider disposing of highly infested mattresses, pillows, furniture, and furnishings.

Environmental signs of a bed bug infestation include a sweet musty odor and rust-colored specks of blood on mattresses or adjacent furniture.²²

Inspecting the bed

Ensure mattress is intact, free of rips and tears. Inspection should focus on the following areas:

- along the seams and piping material
- top, bottom, and all sides of the mattress
- between the mattress, box spring, platform, and/or frame



Box spring inspection

To thoroughly inspect the box spring, remove the thin cloth layer from the underside and:

- Check areas between the box spring and bed frame.
- Look carefully along the surface where the material is tacked to the frame.



Bed frame and headboard inspection

Bed bugs prefer wooden beds and headboards (particularly wicker) but can hide within metal, plastic, and where a mattress meets the frame. Anything constructed of wicker should be thrown away. When examining a bed frame and headboard, always be sure to:

- Visually examine all joints of the frame where pieces connect.
- Check screw and nail holes.
- Separate the bed to inspect the connections between different components.
- Inspect the wall behind the headboard.



Inspecting other furniture near the bed

As the population increases, bed bugs may hide in furniture adjacent to the sleeping area of the host.²¹

- Empty drawers and shelves of furniture close to the bed.
- Place items in plastic bags for inspection and cleaning. This includes, but is not limited to, lamps and electronics (radios, remote controls, alarm clocks, computers, phones).
- Remove drawers and thoroughly inspect screw/nail holes.



Inspection of plush furniture

Inspection of cloth and plush furniture is challenging as the material can increase detection difficulties. Pillow and cushion coverings should be removed and turned inside out for inspection as well. Pay close attention to seams, folds, and zippers. Be sure to remove the cloth backing from the underside of plush furniture to inspect the frame, particularly where the material is stapled to the frame.



Inspection of room perimeter

Bed bugs can congregate at the outer edge of a room including walls, moldings, and rugs.

- Check molding/joints between the floor and wall closest to the bed.
- Use a crevice tool to check behind moldings in a sweeping motion.
- Fold back edges of wall-to-wall carpet and tack strip for carpet and area rugs.
- Remove cover plates of outlets and phone jacks to inspect.
- Check door frames and hinges as well as the borehole for the latch on each door.
- Inspect framed art/or photos.
- Check smoke detectors, under loose wallpaper, behind curtain rods, and inside ceiling lights, and fixtures.



Inspecting unusual locations

Bed bugs can be found in any part of the home. If a bed bug infestation is occurring, the entire home should be inspected. Bed bugs can be found in the following places:

- telephones including cellular, wired, and cordless phones
- lamps and clocks
- computers and other electronics
- cardboard boxes
- toys
- jewelry boxes
- brick walls, “popcorn” or other textured ceilings
- books, magazines, newspapers, and files
- hollow doors

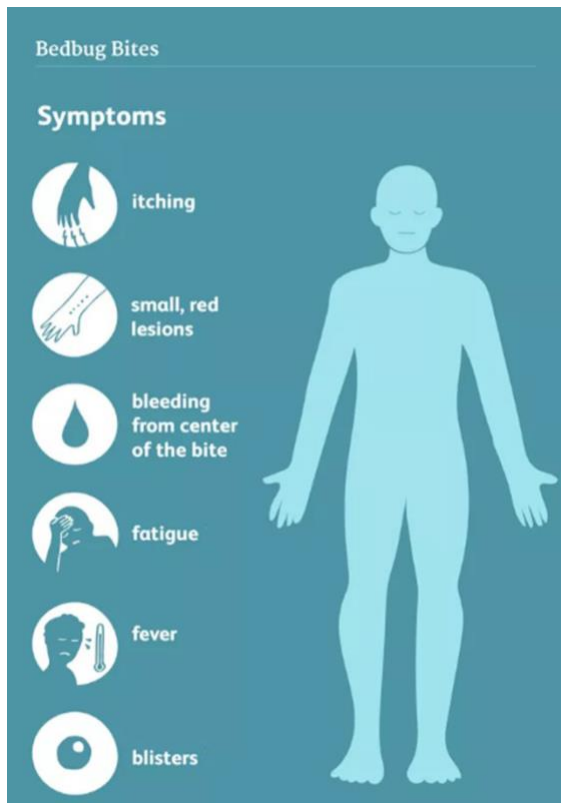


Common Symptoms

A bed bug infestation can be identified either by finding evidence in the environment or by the presence of bite marks on various parts of the body, typically the neck, arms, hands, or face.²¹ Humans can develop marks similar to those resulting from other insect bites (mosquitoes or chiggers), and/or develop a rash or hives. Some may develop itchy welts within a few days of being bitten, but it can take as long as 14 days before symptoms are noticeable.

A wide array of signs and symptoms may occur following a bite from a bed bug. Some people will be completely asymptomatic. Bed bugs excrete an anesthetic into the skin of their host prior to feeding, which can make it difficult to recognize a bite as it is happening.

Signs and symptoms can develop several days following a bite and may include:



- redness
- intense itching at bite sites
- small, red lesions
- bleeding from the center of a bite
- fatigue
- fever
- blisters
- insomnia
- anxiety
- swelling
- angioedema
- generalized urticaria
- iron deficiency
- anemia
- rarely anaphylaxis²³

Treatment for Bed Bug Bites

**Head lice treatments are not effective against bed bugs.
Consult with health professionals for proper care if
necessary.**

A bite from a bed bug generally does not require medical attention, as symptoms typically clear on their own within a week or two.²¹ It is important to clean bite(s) with warm, soapy water. Symptoms can be treated by applying creams or lotions containing hydrocortisone, using an ice pack at the bite site to reduce swelling, and taking an antihistamine.²² It is recommended to avoid scratching affected areas.

Topical insecticide lotions and creams used for the treatment of scabies and head lice **do not** affect bed bugs, and their use to prevent further bites may be dangerous.²²

Environmental Care and Decontamination

Regardless of the environment, a professional with experience treating bed bugs is recommended for safe and effective eradication.²² The following at-home treatments are recommended:

- **Vacuum** all mattresses and furniture at least once a week to remove dust and skin mites.²²
- **Inspect and clean** headboards and bed frames with standard household cleaning supplies or soapy water.²⁶
- **Launder** clothing and bed linens in a high heat setting.²²
- **Move** beds away from walls and remove bed skirts to ensure bedding does not touch the floor.²⁷
- **Extreme heat** of 120 °F for several hours will eliminate nearly all infestations. Use a steam cleaner with hot water paying extra attention to the creases and crevices in mattresses. Placing mattresses in a sauna at 170°F is also effective.²²
- **Decluttering** is important for prevention and elimination of bed bugs.

Pesticides

A pest control professional will utilize insecticides registered with the U.S. Environmental Protection Agency (EPA).²⁶ **If a professional advises to use an appropriate at-home treatment**, always read product labels to determine how and where the insecticide should be applied. Be sure to wear protective gloves, facemasks, and other personal protective equipment during application.²⁷

Integrated Pest Management (IPM)

An IPM program is an efficient and ecologically sensitive method of pest management that combines a combination of industry best practices. IPM programs utilize information about the life cycle of pests and their interactions with humans and the environment.²⁷ This information, along with pest control methods, is utilized to control infestations in the most cost-effective way and with the least possible risk to people, property, and the environment. Bed bug control is most efficient when an IPM approach is employed with active participation by the residents. In multi-family housing, diligent involvement is also required of building management. IPM takes advantage of all suitable pest management possibilities, including the thorough use of pesticides.²⁷

School Policies

Bed bugs can attach themselves to clothing and backpacks and can be unknowingly carried into the school environment. Educators need a formal plan to address this issue that involves effective and sensitive communication with parents. School staff should be educated to know what bed bugs look like and the symptoms that may develop following bed bug bites. Additionally, school staff should be aware of other causes that may produce similar reactions. It is also important to avoid making the student feel self-conscious or embarrassed about a suspected infestation.²³

Like head lice infestations, widespread treatment in a school setting can be costly and unnecessary. With the aid of a pest control professional, a plan can be implemented that will focus treatment on chairs, desks, lockers, coat rooms, and surrounding areas where bed bugs were initially found.²³

At the beginning of each school year, the school community (staff and parent/guardians) should be educated regarding school procedures related to a suspected bed bug infestation. This includes establishing a group of staff that will address parents/guardian questions and concerns. Students should be provided with bed bug inspection forms for home as well as educational materials to raise awareness.

Following detection of bed bugs at school, affected students should not be barred from attending unless persistent unsuccessful attempts have been made to treat an infestation. Schools should not close due to bed bug presence, and if pest management is required it should be directed to specific sections of the school. The school nurse or principal should consider informing the affected class or classes.

Responding to Bed Bugs at School

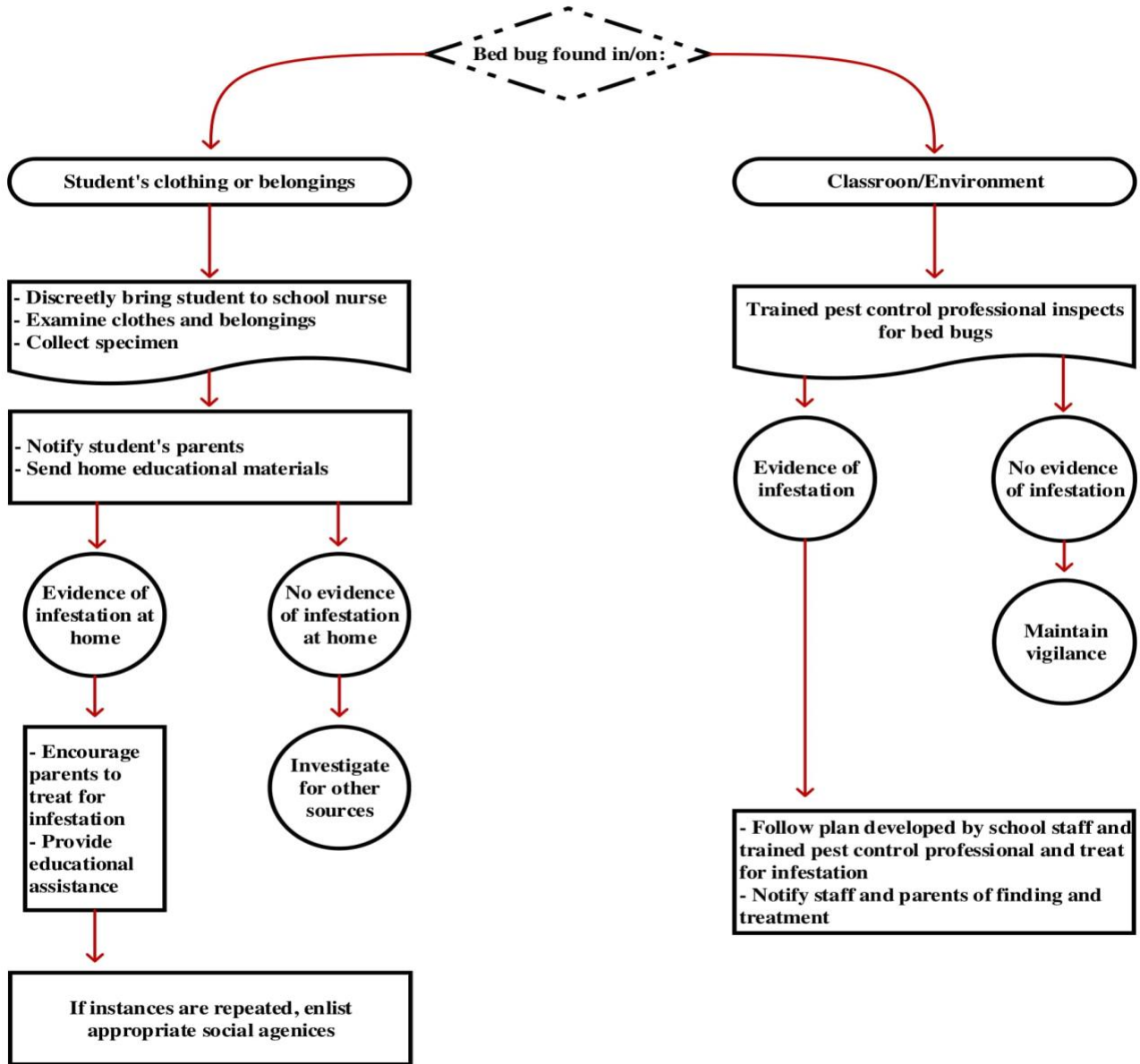
If bed bugs are discovered in a classroom, consider having the room examined by a pest management professional for treatment options.

Lunchboxes, bags, and other belongings that travel back and forth to and from school should also be regularly examined and sealed in plastic containers to inhibit bed bug spread. Solid surfaces should be cleaned regularly, and students should be provided with plastic bins or bags to collect their belongings.²⁴

If a suspected bed bug is found on a student or their belongings:

1. Discretely remove the student from the classroom and escort them to the nurse's office. Have a nurse or school staff member examine the student for bed bugs. Make sure to examine the student's clothing along with any of their belongings. Keep in mind that another student may be the original host.²⁵
2. All visible insects should be removed and collected for further examination. Carefully place specimen(s) in a container ensuring the body of the insect is not damaged. An intact insect makes the identification process easier.
3. Once the specimen is collected, consult with a professional to identify the insect. It is recommended that school officials consult with local pest control professionals or an entomologist working in the school district.
4. If bed bugs are confirmed, have the student change into a temporary set of clothing. Place the student's clothing in a drier for 30 minutes on high heat. Secure other belongings in a tightly sealed garbage bag. Inform parent/guardian.²⁶
 - **If the school does not** have a drier on campus, continue to provide a temporary set of clothing for the student, while placing and tightly securing their clothing in a plastic garbage bag. Provide instructions to parents/guardians on how to handle clothing at home.
5. Check areas where student sits and if belongings were affected look in areas where the belongings were placed for an extended period.²⁵

Arkansas School Response Flowchart



Arkansas School Response Flowchart

Other Biting Arthropods

In addition to bed bugs and head lice, there are other arthropods that are known to cause similar or overlapping signs and symptoms following a bite.

Human Itch Mite (Scabies)

Human scabies is caused by a skin infestation of the human itch mite, which burrows into the surface layers of the skin to live and lay eggs. Similar to head lice, these mites spread by prolonged direct contact with an individual who has scabies. However, the human itch mite is typically not found on the scalp and is very difficult to see with the naked eye.

The human itch mite can be found globally, prevalent in crowded conditions, such as nursing homes, child-care facilities, and prisons. Common signs and symptoms of scabies are a characteristically pimple-like skin rash, small burrow tunnels under the skin, and intense itching typically found in between the fingers, armpits and along the belt line. The human itch mite does not transmit disease.

Body Lice

Body lice are parasitic insects that live on clothing or bedding used by persons with a body lice infestation. Like head lice, body lice are approximately the size of a sesame seed. They spread both through direct skin-to-skin contact with an infested person as well as indirect contact with bedding and other personal items. Body lice infestations are mainly found in homeless populations and refugee camps. Unlike head lice, infestations of body lice rarely affect individuals who are able to bathe and launder clothing on a regular basis.

Pubic “Crab” Lice

Pubic, or crab lice, are blood-feeding parasitic insects that affect populations globally. Although they do not transmit disease, their presence is often correlated with sexually transmitted infections due to being commonly found in the genital area. Crab lice can be found in other areas of coarse hair, such as eyebrows, eyelashes, beards, or mustaches. Adult pubic lice are 1-2 mm in length (smaller than adult head lice) but are usually visible to the naked eye. The most common signs and symptoms of pubic lice are itching in the genital

area and visible crawling lice. Pubic lice are most common in sexually active individuals and should be diagnosed and treated by a medical professional.

Glossary

Bed Bugs: Small, oval, brownish insects that feed on the blood of animals or humans

Head Lice: Blood feeding parasitic insects that can be found on the scalp and hair of a human head

Infestation: The presence of an unusually large number of insects

Louse: Singular form of lice

Nit(s)/Egg(s): Nits are head lice eggs laid by the adult female, firmly attached at the base of the hair shaft near the scalp

Nymph(s): Immature head louse that hatch from an egg and require three substages of development to become an adult

Ovicide: An insecticide that kills the egg stage

Pesticide(s): Any substance intended for preventing, destroying, repelling, or mitigating pests in the environment

Pediculicide(s): An insecticide that kills lice

Topical: A medication applied to the skin

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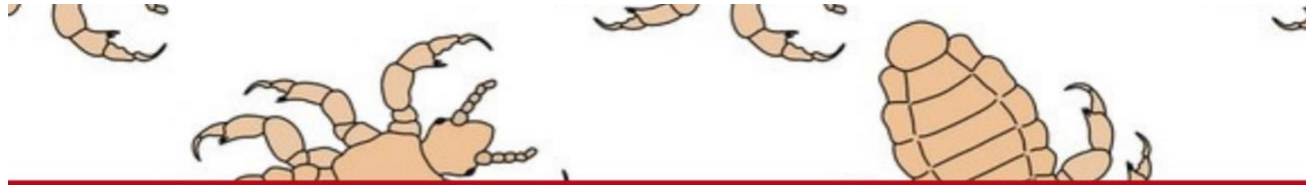
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Appendices

Appendix A: FAQ about Head Lice



FAQS About Head Lice

Head lice A Lousy Problem!

Head lice can have a negative impact on many aspects of daily living, such as social interactions, time away from school or work, and even unplanned financial burdens. As a parent, your child having head lice is your worst nightmare. Here are some questions and concerns that may come up, and information to help you respond quickly to head lice.

Q: What are head lice?

A Head lice are tiny, wingless insects that live close to the human scalp. They feed only on human blood. Head lice cannot jump or fly, and they do not spread disease.



Head Lice under Magnifying Glass

Q: What are the signs and symptoms of head lice infestation?

- Tickling
- Itching
- Irritability
- Soreness

What do head lice look like?

Head lice have three forms:

- Egg/Nit: Nits are lice eggs laid by the adult female head louse at the base of the hair shaft nearest the scalp. Nits are often confused with dandruff, scabs, or hair spray droplets.
- Nymph: A nymph is an immature louse that hatches from the nit. A nymph looks like an adult head louse but is smaller. To live, a nymph must feed on blood.
- Adult: The fully grown and developed adult louse is about the size of a sesame seed, has six legs, and is tan to grayish white in color.



Head Lice Life Cycle

Q: Where are head lice found?

Head lice are most likely to be found on the scalps of preschool and elementary school aged children and their immediate family members. An estimated 6 million to 12 million infestations occur each year in the United States among children 3 to 11 years of age.



Child with head lice

Q: How did my child get head lice?

Head-to-head contact with an already infested person is the most common way. Head-to-head contact is common during play at school, at home, and elsewhere (sports activities, playground, slumber parties, camp).

Q: Does my whole family need to be treated for head lice?

If crawling lice or nits are found, all household members should be examined for crawling lice and nits every 2–3 days. Persons with live (crawling) lice or nits within ¼ inch or less of the scalp should be treated.

Q: Can I use an over-the-counter medication to treat head lice?

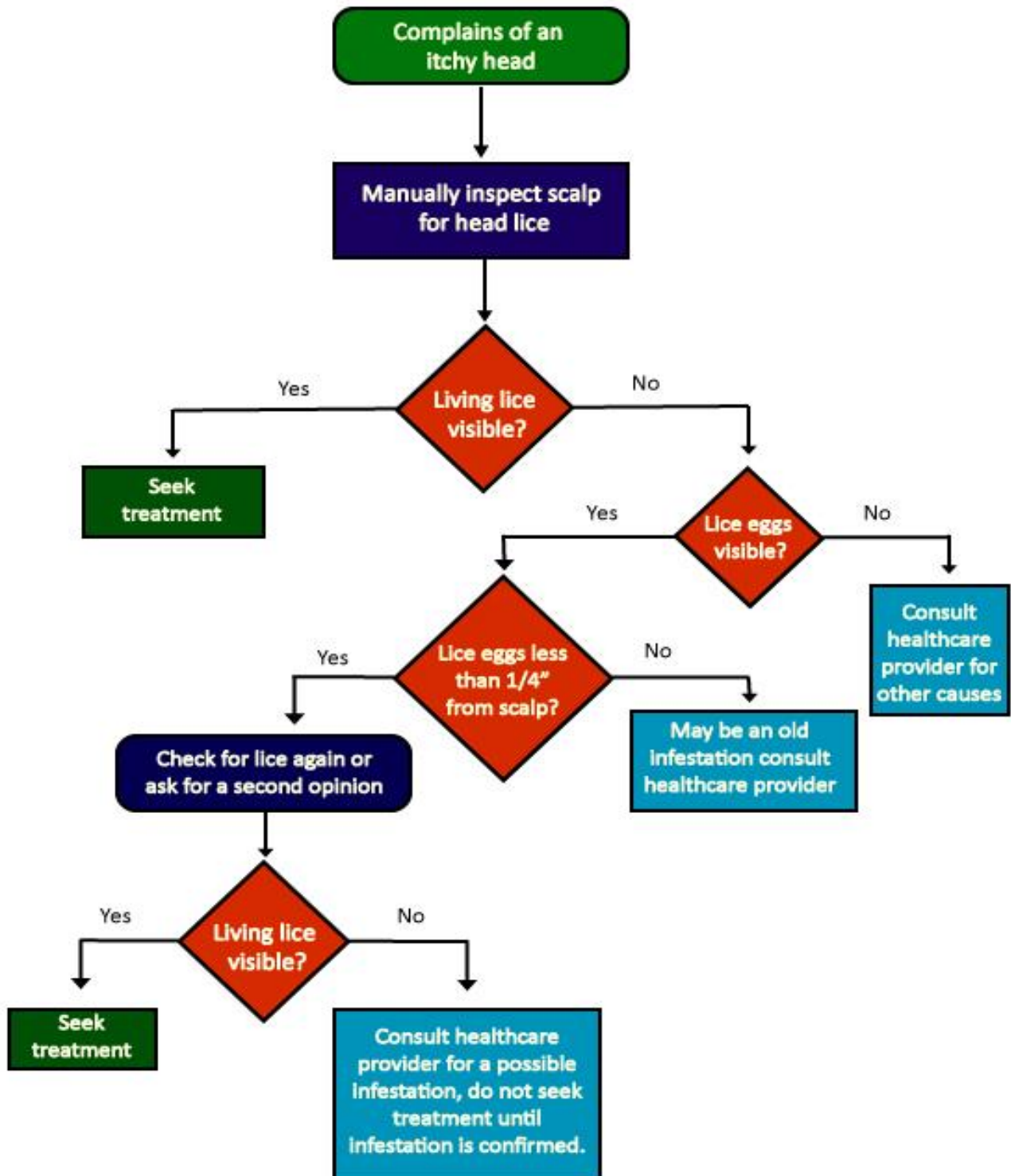
To treat a headlice infestation, use an over the counter or prescription topical product to eliminate the infestation.

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Appendix B: Decision Tree for the diagnosis and treatment of a head lice infestation.

Decision Tree for Diagnosis and Treatment of Head Lice Infestation



Appendix C: Head Lice 101 (Know the Facts)

Head Lice 101: Know the Facts

Parents Guide on Head Lice

The Basics

They're itchy and annoying, and you may find yourself going head-to-head with these bothersome insects during the elementary school years. A common community problem, head lice infestations occur each year in the United States, most commonly among children ages 3 to 11 years old. Though a head lice infestation is often spotted in school, it is usually acquired through direct head-to-head contact elsewhere, such as at sleepovers or camp. Head lice are not dangerous, and they do not transmit disease. Additionally, despite what you might have heard, head lice often infest people with good hygiene and grooming habits. Your family, friends, or community may experience head lice. It's important to know some basics, including how to recognize symptoms and what to do if faced with an infestation.



Head Lice Life Cycle

Little Known Facts About Head Lice

- Lice are known to lay up to 10 eggs a day
- Lice leave their saliva where they bite, which makes the bite itch
- Lice are excellent at hiding themselves by scooting away from light.

Myths about Head Lice

- They do live on pets
- Only people with poor hygiene get head lice
- Head lice "jump" from one person to another
- Cutting a person's hair will prevent head lice infestation
- Head lice carry a disease

How are head lice spread?

- Head lice are spread most commonly by direct contact with the hair of an infested person.
- Spread by contact with inanimate objects and personal belongings may occur but is very uncommon.
- Head lice feet are specially adapted for holding onto human hair. Head lice would have difficulty attaching firmly to smooth or slippery surfaces like plastic, metal, polished synthetic leathers, and other similar materials.

Other things to consider

If you suspect your child might have head lice, it's important to talk to a school nurse, pediatrician, or family medical provider to get appropriate care. When treating head lice, supplemental measures can be combined with recommended prescription medicine (pharmacologic treatment); however, such additional (non-pharmacologic) measures generally are not required to eliminate a head lice infestation (CDC.gov). Other things to consider are:

- Have the infested person put on clean clothing after treatment.
- If a few live lice are still found 8–12 hours after treatment, but are moving more slowly than before, do not retreat.
- Apply lice medicine, also called pediculicide, according to the instructions contained in the box or printed on the label.
- After each treatment, checking the hair and combing with a nit comb to remove nits and lice every 2–3 days may decrease the chance of self-reinfestation.
- Retreatment is meant to kill any surviving hatched lice before they produce new eggs. For some drugs, retreatment is recommended routinely about a week after the first treatment (7–9 days, depending on the drug) and for others only if crawling lice are seen during this period.
- There is little to no clinical evidence of the effectiveness of home remedies to treat head lice.

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Appendix D: Head Lice Parent Letter

Date:

Dear Parent,

Your child was sent home from school today because he/she was found to have head lice. This letter will help you understand what a head lice infestation is and how to properly treat your child. Lice infestations are not considered a health hazard, and head lice are not known to spread disease. Having head lice does not mean that your child or home is unclean. Bathing everyday will not treat or prevent a lice infestation.

Individual Treatment:

1. Remove all your child's clothing and place him or her in a bath or shower stall.
2. Apply head lice treatment **EXACTLY** as directed by the label or your doctor.
3. Have your child put on clean clothing after treatment.
4. Repeat treatment according to the label, usually in 7-10 days.
5. All family members and close friends should be examined for head lice. Family members who have evidence of infestation (crawling lice or eggs) should be treated. Siblings or a parent who shares a bed with a known infested child should be treated, whether or not there is evidence of infestation at the time of the examination.

There are many inexpensive treatments for head lice. Treatments for head lice are applied directly to the scalp and can be found at local drug stores or pharmacies. Names of common treatments include RID, Kwell, A-200, and Triple X (A doctor must write a prescription for Kwell). There is no evidence that one treatment works better than the others. If you have questions or need advice, talk to your doctor or medical provider. Treat only those with active infestations or who share a bed with a person with an infestation.

Decontamination of Home and Personal Items:

1. Machine wash all washable clothing and bed linens that have been in contact with your child within the previous three days.
2. If there is no access to a washing machine, place items in a dryer on the highest setting for at least 30 minutes.
3. If there is no access to a clothes dryer, dry clean or place items in a plastic bag and seal for two weeks.
4. Combs and brushes can be disinfested by either soaking in Lysol for one hour, or in a pan of water heated on the stove for 5-10 minutes at a temperature of at least 125F. Caution: High heat may damage these items
5. Because lice only live for a short time off the head, the U.S. Public Health Service recommends that environmental cleanup be limited to simple vacuuming of carpets, furniture, and other upholstered items.
6. Use of insecticides or fumigants on upholstered furniture, carpets, bedding, etc. is NOT recommended. Fumigant spray and fogs can be toxic if inhaled or absorbed through the skin and are not necessary to control head lice.
7. High heat kills lice and lice eggs on personal items like clothing, bed linens, and towels. Lice eggs are harder to kill than crawling lice and require exposure to hot water of at least 125F. Make sure your water heater is set high enough to maintain these temperatures and allow time between laundry loads to allow the water heater to reheat.
8. Do not apply high heat to a child's head. Lice treatment shampoo is a safe method to treat head lice.

Returning to School

Your child may return to school the morning after he or she has been treated by a shampoo that is *approved* to treat head lice.

How are lice passed to another person?

Lice can be passed to someone at home, school, church, or other public places. Casual and brief contact, like shaking hands, does not lead to lice transmission. Head lice cannot jump or fly and are usually passed to someone else through close head-to-head physical contact with another infested person.

Sharing of the following items may also spread head lice:

- combs and brushes
- hats, caps, or wigs
- coats, scarves, or other clothing
- helmets or headphones
- pillows or towels

What do lice look like?

Head lice are grayish-white insects about the size of a sesame seed. They move very quickly which makes them difficult to find in a child's hair. The most common place to find lice is at the nape of the neck and behind the ears. Often lice eggs, or "nits", can be found attached to a single hair near the scalp. These nits can be yellowish brown or white and can be as small as a poppy seed. Eggs are attached very firmly to the hair shaft and cannot be washed out.

Sometimes nits can be mistaken for dandruff. If someone has had close contact exposure to lice, it is important to inspect their entire head using a comb and a bright light.

Some people will be unaware they have lice nor have any symptoms. Others will experience intense itching of the scalp, develop small red bumps on the head or neck, or feel a tickling or crawling sensation. These symptoms can cause irritability due to lack of rest.

Notification of Other Parents

We ask you to notify the parents of your child's friends that have been in close contact with your child, especially if the children have slept near each other or participated in contact sports such as wrestling, ballet, football, etc.

Thank you for your assistance with this matter,