

**PREVENTION, CONTROL AND TREATMENT
OF HEAD LICE INFESTATIONS
IN SCHOOLS**

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TABLE OF CONTENTS

I.	Introduction.....	2
II.	Development Stages of Head Lice.....	3-4
III.	Spread of Head Lice.....	5
IV.	Symptoms of Head Lice Infestation.....	5
V.	Head Lice Treatment	
	A. Lice killing medication (pediculicides).....	6-9
	B. Screening and manual removal of head lice and nits..	9-10
	C. Alternative treatments.....	10-13
VI.	Prevention and Control of Head Lice in the Home	
	A. Cleaning the home environment.....	13-15
VII.	Guidelines for the Control and Treatment of Head Lice/Nits in the School Setting.....	15-19
VIII.	References.....	20

I. INTRODUCTION

“Adult head lice are roughly 2–3 mm long. Head lice infest the head and neck and attach their eggs to the base of the hair shaft. Lice move by crawling; they cannot hop or fly.

Head lice infestation, or pediculosis, is spread most commonly by close person-to-person contact. Dogs, cats, and other pets do not play a role in the transmission of human lice.

Both over-the-counter and prescription medications are available for treatment of head lice infestations” (1).

Causal Agent:

“*Pediculus humanus capitis*, the head louse, is an insect of the order Psocodea and is an ectoparasite whose only host are humans. The louse feeds on blood several times daily and resides close to the scalp to maintain its body temperature” (2).

II. DEVELOPMENT STAGES OF HEAD LICE

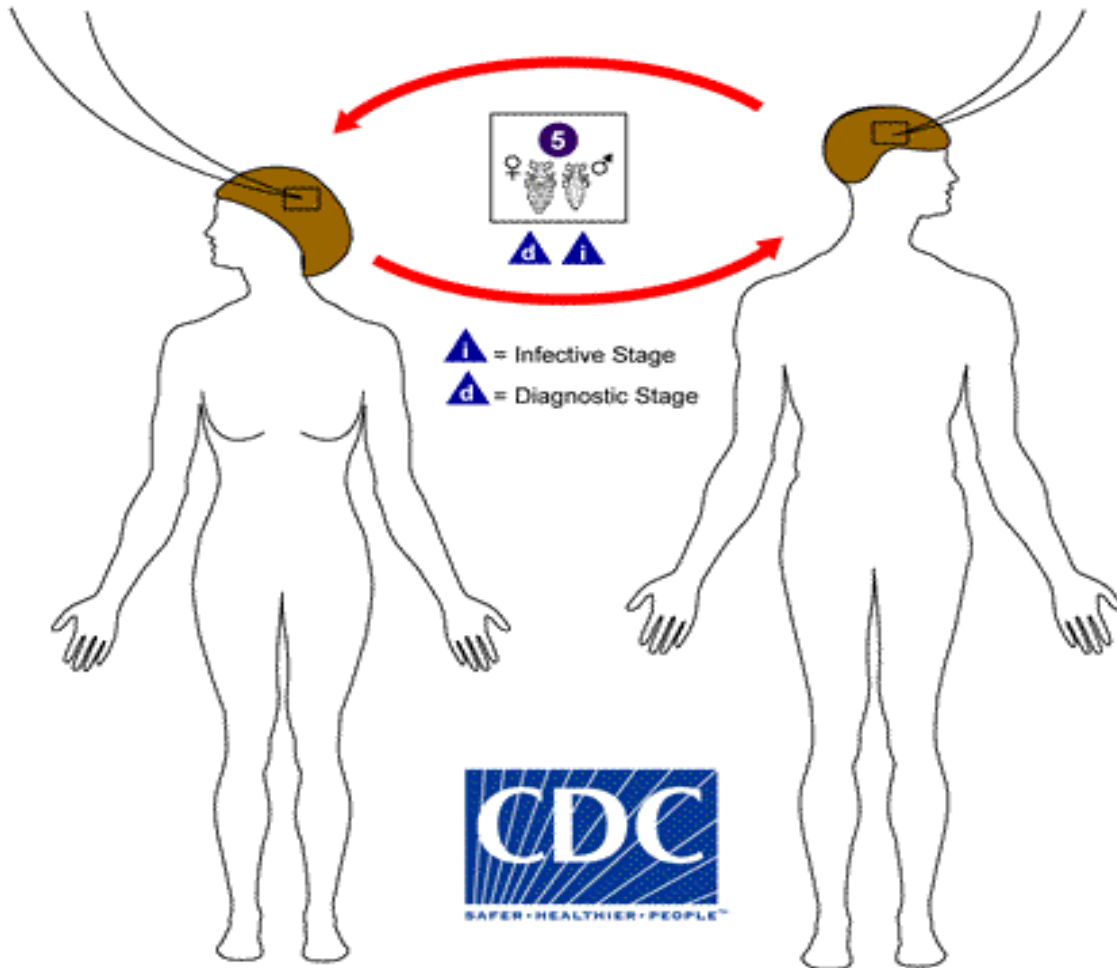
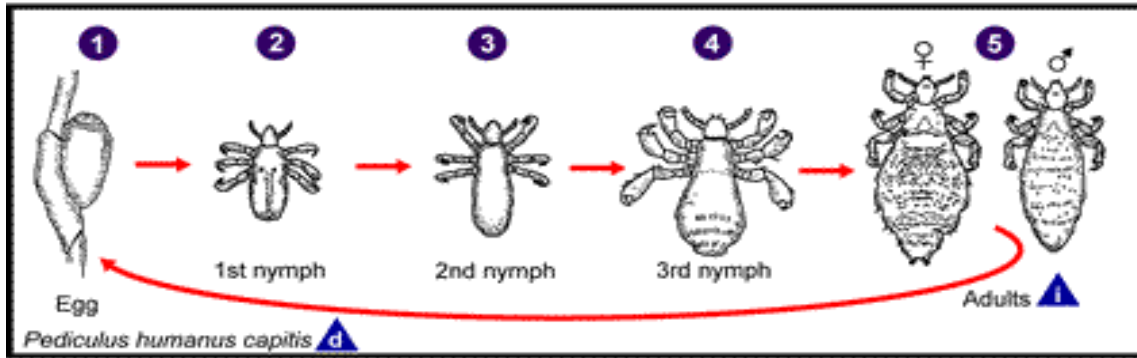
The life cycle of the head louse has three stages: egg, nymph, and adult.

Eggs: Nits are head lice eggs. They are hard to see and are often confused for dandruff or hair spray droplets. Nits are laid by the adult female and are cemented at the base of the hair shaft nearest the scalp. They are 0.8 mm by 0.3 mm, oval and usually yellow to white. Nits take about 1 week to hatch (range 6 to 9 days). Viable eggs are usually located within 6 mm of the scalp.

Nymphs: The egg hatches to release a nymph. The nit shell then becomes a more visible dull yellow and remains attached to the hair shaft. The nymph looks like an adult head louse, but is about the size of a pinhead. Nymphs mature after three molts and become adults about 7 days after hatching.

Adults: The adult louse is about the size of a sesame seed, has 6 legs (each with claws), and is tan to grayish-white. In persons with dark hair, the adult louse will appear darker. Females are usually larger than males and can lay up to 8 nits per day. Adult lice can live up to 30 days on a person's head. To live, adult lice need to feed on blood several times daily. Without blood meals, the louse will die within 1 to 2 days off the host (2).

LIFE CYCLE:



III. SPREAD OF HEAD LICE

“Head lice are spread most commonly by direct head-to-head (hair-to-hair) contact. However, much less frequently they are spread by sharing clothing or belongings onto which lice have crawled or nits attached to shed hairs may have fallen. The risk of getting infested by a louse that has fallen onto a carpet or furniture is very small. Head lice survive less than 1-2 days if they fall off a person and cannot feed; nits cannot hatch and usually die within a week if they are not kept at the same temperature as those found close to the scalp” (2).

IV. What are the signs and symptoms of head lice infestation?

- Tickling feeling of something moving in the hair.
- Itching, caused by an allergic reaction to the bites of the head louse.
- Irritability and difficulty sleeping; head lice are most active in the dark.
- Sores on the head caused by scratching. These sores can sometimes become infected with bacteria found on the person’s skin.

Most health departments do not require reporting of head lice infestation. However, it may be beneficial for the sake of others to share information with school nurses, parents of classmates, and others about contact with head lice.

V. Head Lice Treatment

A. Lice Killing Medications (pediculicides)

Over-the-counter Medications

“Many head lice medications are available “Over-the-counter” without a prescription at a local drug store or pharmacy. Each Over-the-counter product approved by the FDA for the treatment of head lice contains one of the following active ingredients. Always follow the label instructions when administering these medications. If crawling lice are still seen after a full course of treatment contact your healthcare provider.

1. Pyrethrins combined with piperonyl butoxide;

Brand name products:

A-200*, Pronto*, R&C*, Rid*, Triple X*. Pyrethrins are naturally occurring pyrethroid extracts from the chrysanthemum flower. Pyrethrins are safe and effective when used as directed. Pyrethrins can only kill live lice, not unhatched eggs (nits). A second treatment is recommended 9 to 10 days after the first treatment to kill any newly hatched lice before they can produce new eggs. Pyrethrins generally should not be used by persons who are allergic to chrysanthemums or ragweed. Pyrethrin is approved for use on children 2 years of age and older. The efficacy of pyrethrins may be reduced because of development of resistance, but the prevalence of resistance has not been well studied and is unknown. If crawling lice are still seen after a full course of treatment contact your healthcare provider.

2. Permethrin lotion, 1%;

Brand name product:

Nix*. Permethrin is a synthetic pyrethroid similar to naturally occurring pyrethrins. Permethrin lotion 1% is approved by the FDA for the treatment of head lice. Permethrin is safe and effective when used as directed. Permethrin kills live lice but not unhatched eggs.

Permethrin may continue to kill newly hatched lice for several days after treatment. A second treatment often is necessary on day 9 to kill any newly hatched lice before they can produce new eggs. Permethrin is approved for use on children 2 months of age and older. Resistance to 1% permethrin has been reported, but its prevalence is unknown. If crawling lice are still seen after a full course of treatment contact your healthcare provider” (2).

Prescription Medications

“The following medications, in alphabetical order, approved by the U.S. Food and Drug Administration (FDA) for the treatment of head lice are available only by prescription. Always follow the instructions of your health care provider when administering these medications. If crawling lice are still seen after a full course of treatment, contact your healthcare provider.

- Benzyl alcohol lotion, 5%;
Brand name product: Ulesfia lotion
*Benzyl alcohol is an aromatic alcohol. Benzyl alcohol lotion, 5% has been approved by the FDA for the treatment of head lice and is considered safe and effective when used as directed. It kills lice but it is not ovicidal. A second treatment is needed 7 days after the first treatment to kill any newly hatched lice before they can produce new eggs. Benzyl alcohol lotion is intended for use on persons who are 6 months of age and older and its safety in persons aged more than 60 years has not been established. It can be irritating to the skin.
- Ivermectin lotion, 0.5%;
Brand name product: Sklice
*Ivermectin lotion, 0.5% was approved by the FDA in 2012 for treatment of head lice in persons 6 months of age and older. It is not ovicidal, but appears to prevent nymphs (newly hatched lice) from surviving. It is effective in most patients when given as a single application on dry hair without nit combing. It should not be used

for retreatment without talking to a healthcare provider. Given as a tablet in mass drug administrations, oral ivermectin has been used extensively and safely for over two decades in many countries to treat filarial worm infections. Although not FDA-approved for the treatment of lice, ivermectin tablets given in a single oral dose of 200 micrograms/kg or 400 micrograms/kg repeated in 9-10 days have been shown effective against head lice. It should not be used in children weighing less than 15 kg or in pregnant women.

- Malathion lotion, 0.5%;

Brand name product: Ovide

*Malathion is an organophosphate. The formulation of malathion approved in the United States for the treatment of head lice is a lotion that is safe and effective when used as directed. Malathion is pediculicidal (kills live lice) and partially ovicidal (kills some lice eggs). A second treatment is recommended if live lice still are present 7–9 days after treatment. Malathion is intended for use on persons 6 years of age and older. Malathion can be irritating to the skin. Malathion lotion is flammable; do not smoke or use electrical heat sources, including hair dryers, curlers, and curling or flat irons, when applying malathion lotion and while the hair is wet.

- Spinosad 0.9% topical suspension;

Brand name product: Natroba

*Spinosad is derived from soil bacteria. Spinosad topical suspension, 0.9%, was approved by the FDA in 2011. Since it kills live lice as well as unhatched eggs, retreatment is usually not needed. Nit combing is not required. Spinosad topical suspension is approved for the treatment of children 6 months of age and older. It is safe and effective when used as directed. Repeat treatment should be given only if live (crawling) lice are seen 7 days after the first treatment.

For second-line treatment only:

- Lindane shampoo 1%;
Brand name products: None available
Lindane is an organochlorine. The American Academy of Pediatrics (AAP) no longer recommends it as a pediculicide. Although lindane shampoo 1% is approved by the FDA for the treatment of head lice, it is not recommended as a first-line treatment. Overuse, misuse, or accidentally swallowing lindane can be toxic to the brain and other parts of the nervous system; its use should be restricted to patients for whom prior treatments have failed or who cannot tolerate other medications that pose less risk. Lindane should not be used to treat premature infants, persons with HIV, a seizure disorder, women who are pregnant or breast-feeding, persons who have very irritated skin or sores where the lindane will be applied, infants, children, the elderly, and persons who weigh less than 110 pounds. Retreatment should be avoided” (2).

When treating head lice

1. “Do not use extra amounts of any lice medication unless instructed to do so by your physician and pharmacist. The drugs used to treat lice are insecticides and can be dangerous if they are misused or overused.
2. All the medications listed above should be kept out of the eyes. If they get onto the eyes, they should be immediately flushed away.
3. Do not treat an infested person more than 2-3 times with the same medication if it does not seem to be working. This may be caused by using the medicine incorrectly or by resistance to the medicine. Always seek the advice of your health care provider if this should happen. He/she may recommend an alternative medication.
4. Do not use different head lice drugs at the same time unless instructed to do so by your physician and pharmacist.

5. The AAP rinsing all topical pediculicides from the hair over a sink, rather than in the shower or bath to limit skin exposure, and to use warm water rather than hot water to minimize absorption” (3).

B. Manual removal of head lice and nits

1. “Work under a good light, such as a lamp or the natural sunlight from sitting by a window or going outdoors.
2. Use a grooming comb or hairbrush to remove tangles then divide the hair in sections and fasten off the hair that is not being worked on.
3. Use the lice comb to detect the presence of lice and nits.
4. Using the lice comb, go through the section from the scalp to the end of the hair. You can dip the comb into a cup of water, use a paper towel, or use the LiceMeister® comb cleaning device to remove any lice, nits or debris from the comb between passings.
5. Look through that same section of hair for attached nits (lice eggs) and live lice. Nits are always oval-shaped. While usually grayish-white they can vary in color. Viable nits are generally laid close to the scalp but can be found anywhere on the hair shaft.
6. Remember, all lice-killing products are pesticides. If you choose to purchase an over-the-counter treatment, follow the directions carefully and use caution. Consult your pharmacist or physician before applying or using lice treatment pesticides when the person involved is pregnant, nursing, has allergies, asthma, epilepsy, pre-existing medical conditions, or has lice or nits in the eyebrows or eyelashes. Never use products that contain lindane. Never use a pesticide on or near the eyes.
7. Wash bedding and recently worn clothing in hot water and dry in a hot dryer. Vacuuming is the safest and best way to remove lice or fallen hairs with attached nits from upholstered furniture, rugs, stuffed animals and car seats. Avoid lice sprays!

8. Use the lice comb cleaning device to clean between the tynes of the lice comb. The comb should be boiled before use on different individuals.
9. Even under the best of conditions, a few lice or nits may be missed. Use the lice comb to screen the infested person every day and regularly thereafter. Seeing a nit or two the next day does not necessarily mean reinfestation. However, be sure to remove them immediately. Being consistent and diligent about screening and manual removal will go a long way toward controlling the problem.
10. If additional nits (at least 3-5 per day) are discovered, this may signal that live lice may be on the head. Another thorough manual search is recommended at that time. Remember also that each day is a new day for the risk of a new infestation. Daily screening is vital for anything that may have been missed and for identifying a new infestation as early as possible.

C. Alternative Treatments

Wet Combing

“One of the most effective ways to remove lice—and the only method for children aged two months and younger—is through wet combing.

Wetting the hair temporarily keeps lice from moving as they cling to the hair follicles.

Oils or leave-in conditioners can make hair easier to comb through.

While hair is wet, use a fine-tooth lice comb to remove larvae, nymphs, and nits.

Wipe the comb clean after each pass through the hair to ensure you’re not redepositing nits or larvae back onto the scalp.

Repeat this process every 2-3 days for 9-14 days.

Though this method can be time consuming, it’s effective in removing lice without relying on medicated treatments.

Mayonnaise

This home remedy aims to smother or suffocate the lice.

Mayonnaise can be quite messy to apply and remove. Use dish soap to wash out the mayonnaise after it has been on for 10-12 hours.

It isn't particularly pleasant to leave on your head for 10-12 hours. (using a shower cap helps keep product in place)

Petroleum Jelly

Petroleum jelly has been proven to have more efficacy than other smothering treatments.

One study demonstrated that only 6% of lice eggs hatched after petroleum jelly treatments.

That said, 6% of eggs hatching can still create a secondary round of infestation.

With any lice-smothering attempt, follow up with fine-tooth combing to ensure complete removal.

Olive Oil

One study showed olive oil to be among the most effective of the natural remedies they tested.

Oils are consistently more effective when used with a shower cap to ensure full coverage over a longer period.

Oils can be easier to work with and pass a comb through than thicker substances like petroleum jelly or mayonnaise.

Coconut Oil

Coconut oil also works to suffocate lice and has been shown to be especially effective when combined with anise oil.

A study from Brazil found that after a four-hour period of coconut oil application, up to 80% of lice were dead.

Coconut oil can be difficult to apply and comb out, as it hardens in colder temperatures.

Tea Tree Oil

Though many people are sensitive to tea tree oil, it has been shown to be effective at killing lice.

One study showed a 100% mortality rate after 30 minutes of treatment.

A tea tree oil-scented spray or shampoo may be useful in preventing reinfestation.

To minimize skin sensitivity, dilute this essential oil in a carrier oil such as coconut, olive, or almond oil.

Tea tree oil may be considered an endocrine disruptor, so caution is advised before considering use in children.

Lavender Oil

Lavender oil has proven beneficial in treating lice when combined with tea tree oil.

There isn't enough data to prove that lavender oil alone can treat or prevent lice.

Lavender also works as an insect repellent but isn't the strongest option.

As with any essential oils, dilute lavender oil in a carrier oil to avoid irritation.

Lavender oil may be considered an endocrine disruptor, so caution is advised before considering use in children.

Baking Soda

Baking soda hasn't been proven to effectively kill lice.

Keep baking soda out of the eyes.

Don't leave it on the skin for an extended period.

Heat

Lice and their eggs can't survive temperatures above 128.3°F for longer than five minutes.

Heat in this range is too hot for soaking your scalp and hair, so this method is only effective when laundering clothing and bedding items.

Lice can't survive away from their hosts, so you don't need to launder your entire wardrobe.

Simply wash and dry the clothes worn by affected family members within a week of infestation in temperatures of at least 130°F.

You can ensure lice and nits that have been removed from the head die by soaking brushes and combs in very hot or boiling water for 5-10 minutes” (3).

VI. Prevention and Control of Head Lice in the Home

A. Home Environment Environmental Control

Washable Items:

- “Machine-wash in hot, soapy water then dry. Use the hot cycle of a dryer for at least 20 minutes. Wash all washable clothing (including hats, scarves and coats) and all bed linens, towels and washcloths that have had contact with your child in the past 3 days.
- Soak combs, brushes, hair barrettes, hair bands and sports helmets:
 - In hot water (above 130°F) for 10 minutes
 - In a solution made with the Nix Creme Rinse® for one hour
 - In rubbing alcohol for one hour, then washed in hot, soapy water” (4).

Non-washables:

- “Vacuum all carpets and furniture, including beds. This will remove any hairs that might have nits attached that are still alive.
- Do not spray insecticides on carpet and furniture nor hire a pest control company to treat your home. It is not necessary and could expose children to harmful chemicals.
- Pillows, stuffed animals, clothing and other things that cannot be washed may be dry-cleaned. Or you can put them in a tightly-sealed plastic bag for 3 days. Any nits or lice on these things will die in 2 days.
- Check the hair and scalp of all family members every 2 to 3 days by combing the hair until no live lice are found for 10 days. If you find nits or lice, treat that family member’s hair and clothing the same way” (4).

It is not necessary to treat anyone unless they have lice. Treatment that is not needed increases resistance to the lice medicine.

The following are steps that can be taken to help prevent and control the spread of head lice:

- Avoid head-to-head (hair-to-hair) contact during play and other activities at home, school, and elsewhere (sports activities, playground, slumber parties, camp).
- Do not share clothing such as hats, scarves, coats, sports uniforms, hair ribbons, or barrettes.
- Do not share combs, brushes, or towels. Disinfest combs and brushes used by an infested person by soaking them in hot water (at least 130°F) for 5–10 minutes.
- Do not lie on beds, couches, pillows, carpets, or stuffed animals that have recently been in contact with an infested person.
- Machine wash and dry clothing, bed linens, and other items that an infested person wore or used during the 2 days before treatment using the hot water (130°F) laundry cycle and the high heat drying cycle. Clothing and items that are not washable can be dry-cleaned OR sealed in a plastic bag and stored for 2 weeks.
- Vacuum the floor and furniture, particularly where the infested person sat or lay. However, spending much time and money on house cleaning activities is not necessary to avoid reinfestation by lice or nits that may have fallen off the head or crawled onto furniture or clothing.
- Do not use fumigant sprays or fogs; they are not necessary to control head lice and can be toxic if inhaled or absorbed through the skin.

To help control a head lice outbreak in a community, school, or camp, children can be taught to avoid activities that may spread head lice.

VII. Guidelines for the Control and Treatment of Head Lice/Nits in the School Setting

Current evidence-based practice does not support exclusion of students for head lice, nor the efficacy and cost-effectiveness of classroom or school-wide screening for decreasing the incidence of head lice among school children. School administrators and school nursing staff are encouraged to help educate parents and staff about the diagnosis, treatment, and prevention of head lice.

Students diagnosed with lice head lice should not be sent home early from school. Such students may go home at the end of the school day in the manner they are accustomed to and should be permitted to return to school after appropriate treatment is started. Head lice can be a nuisance but they have not been shown to spread disease. Exclusion from class or school is generally not warranted.

In accordance with recommendations of the Center for Disease Control (CDC), the National Association of School Nurses, and the American Academy of Pediatrics, the following guidelines and procedures shall be used to respond to the presence of head lice in the school setting.

Head lice shall be treated as a medical issue deserving the same level of confidentiality as any other medical concern.

1. Measures to avoid isolating or stigmatizing students with suspected or known/confirmed head lice shall be utilized.
2. The school nurses/nursing staff shall determine the appropriate course of action for each presentation of head lice on a case-by-case basis. This includes, but is not limited to , communication to parents and classroom or grade level head lice checks if warranted.
3. School personnel involved in the detection of head lice infestation shall be appropriately trained. All adult assistance with any classroom or grade level head lice checks shall be conducted under the guidance and direction of the school nurse.

4. In cooperation with the school nurse the school administration shall assist in the proper education of parents and staff members about the diagnosis, treatment, and prevention of head lice.

IF SUSPECTED:

1. If suspected of having head lice, the student shall be removed from the classroom as unobtrusively as possible for further inspection.
2. A student may be suspected of having head lice if the following are noted:
 - a. The student complains of an “itchy scalp” or is observed repetitive scratching of his/her scalp.
 - b. The student has nits and/or live lice.
 - c. The student has open sores/lesions on the scalp.
3. The student may be inspected privately by the school nurse, or by other trained building personnel designated by the principal in collaboration with the school nurse.

IF THE STUDENT IS FOUND TO HAVE LIVE HEAD LICE OR NITS:

1. The parent/guardian or the designated emergency contact person will be notified. The student shall be allowed to return to the classroom for the remainder of the day if practical to do so.
2. While there is no medical reason to remove a child from school due to head lice, the student’s parent/guardian or emergency contact may choose to take the student home before the end of the school day.
3. The student shall be readmitted once treatment has been completed. School nurses may assist parents in determining choice of treatment. Students may be re-inspected by the school nurse and/or principal’s designee, upon return to school. Re-inspection or the absence of live lice or nits is not required for readmission to school. The goal shall be to assist the family in breaking the cycle of reinfestation while encouraging school attendance and supporting the student’s emotional health.
4. A student should not miss more than one day of school following head lice detection. Truancy laws will apply to students missing an excessive amount of school due to head lice infestations.

5. Parent conferences may be appropriate when a student is frequently absent due to head lice infestations. Referrals to community agencies may be appropriate.

CONFIDENTIALITY:

All information shall be treated according to “circles of confidentiality”. Only those that need to know.

REPORTING:

1. Parents/guardians are requested to report to the school cases of head lice infestation that they discover at home. The school nurse, principal, or principal’s designee will determine what interventions are appropriate in the school setting.

LIMITING OUTBREAKS:

1. The Ladysmith School District reserves the right to inspect other known household contacts (e.g., siblings) and close personal contacts attending school in an effort to stem outbreaks in other classes. However, seldom is inspecting an entire classroom or student body necessary or effective.

2. The school nurse shall monitor environmental conditions and be responsible for making recommendations to decrease transmission of head lice.

EDUCATION:

1. Parents/guardians of school children shall receive head lice information upon positive findings.

2. Head lice information shall be available upon request from the school nurse.

3. While no school can be entirely risk free from head lice, it is felt that efforts directed towards awareness and prevention will result in fewer infestations and be cost and time effective.

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