Dear Parent/Guardian:

Some of our students and their families have had to deal with the frustrating and uncomfortable issue of head lice. Head lice are a common occurrence in schools and are of no health concern as they do not transmit disease. However, when a family is dealing with head lice in their home these facts provide little comfort. Let me take this opportunity to share with your some information and guidance. In addition, there is an extensive overview of treatments and interventions at the end of this letter for your review.

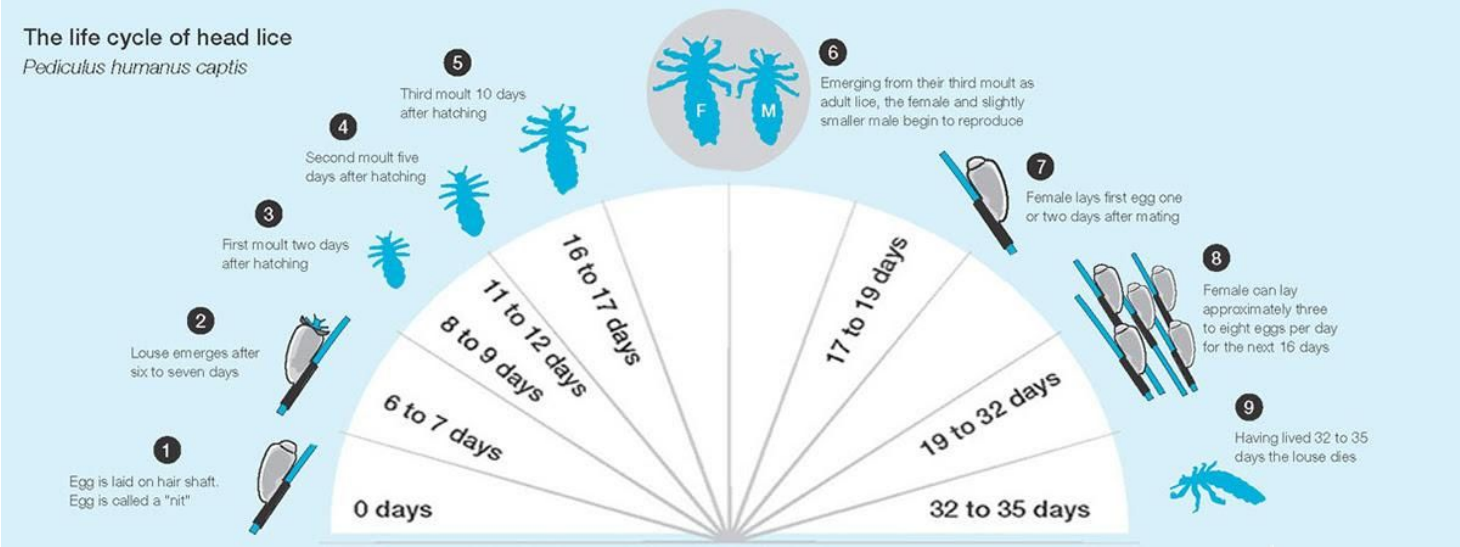
MNSD STATISTICS

1. See chart "Conditions Reported to MNSD" under CURRENT HEALTH STATUS AT MNSD on the District Nurse website for current number of reported cases.
2. Definitions:
    a. Case of lice / infestation– the presence of a nit, nits, or louse (juvenile or adult)
    b. Case reported or identified – the case of lice was reported to the school by another (e.g. parent, guardian) or was identified by specially trained school staff
    c. Classroom Head Lice Inspection – the inspection of all students in a given classroom, and potentially their siblings, by specially trained school staff if. This may be done if five or more cases of head lice are active within the classroom.

MYTH BUSTERS AND FACTS

1. It is unlikely that all head lice infestations can be prevented, because young children come into head-to-head contact with each other frequently.
2. Head lice are a nuisance, head lice are not dangerous, do not present a health hazard, and do not transmit disease.
3. Head lice are NOT a sign of poor hygiene.
4. Transmission of head lice occurs by direct head-to-head contact.
5. Head lice do not hop or jump; they can only crawl.
6. Pets do not play a role in the transmission of human lice.
7. Indirect spread through contact with personal belongings of an infested individual (combs, brushes, hats) is much less likely to occur. In one study, live head lice were found on only 4% of pillowcases used by infested volunteers.
8. Head lice found on combs are likely to be injured or dead.
9. Head lice are not likely to leave a healthy head unless there is a heavy infestation.
10. Head lice are commonly mistaken for dandruff but cannot be removed or brushed off.
11. Head lice may cause itching and scratching of the scalp, especially at the back of the head, behind the ears and along the hairline.
12. It is prudent for children to be taught not to share personal items, such as combs, brushes, and hats, but one should not refuse to wear protective headgear because of fear of head lice.
13. In environments where children are together, infested children should be treated promptly to minimize spread.
14. Regular surveillance by parents is one way to detect and treat early infestations, thereby preventing the spread to others.
15. Financial burden: Anecdotal reports from the 1990s estimated annual direct and indirect costs related to lice totaling $367 million, including remedies and other consumer costs, lost wages, and school system expenses. Most recently, treatment costs have been estimated at $1 billion.

THE LIFE CYCLE OF HEAD LICE



- Pediculus humanus capitis – scientific name for 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 confused with 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.
    - Nits are loosely attached to the hair shaft near the scalp, yet they are more difficult to remove than a flake of dandruff. You can slide your finger down the hair shaft and you will feel the nit as a little bump.
- 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.

RESEARCH, EPIDEMIOLOGY, AND POSITION STATEMENTS

1. Lice are very common: Reliable data on how many people get head lice each year in the United States are not available; however, an estimated 6 million to 12 million infestations occur each year in the United States among children 3 to 11 years of age. CDC
2. Lice are becoming resistant to Over-the-Counter (OTC) Treatments: Lice from 138 geographical collection sites, ranging from rural to metropolitan areas, were collected from 48 states have shown a substantial decrease in the ability of the Permethrin-based OTC products in providing effective control of infestations over time. Expansion of the Knockdown Resistance Frequency Map for Human Head Lice in the United States Using Quantitative Sequencing
3. American Academy of Pediatrics Clinical Report on Head Lice
4. provides the following guidance:
    a. No healthy child should be excluded from school or allowed to miss school time because of head lice or nits.
        i. Pediatricians may educate school communities that no-nit policies for return to school should be abandoned.
    b. Unless resistance to these products has been proven in the community, Permethrin or Pyrethrins are a reasonable first choice for primary treatment of active infestations if pediculicide therapy is required.
        i. Carefully communicated instructions on the proper use of products are important. Because current products are not completely ovicidal, applying the product at least twice, at proper intervals, is indicated if Permethrin or Pyrethrin products are used or if live lice are seen after prescription therapy per manufacturer's guidelines. Manual removal of nits immediately after treatment with a pediculicide is not necessary to prevent spread.
        ii. If resistance to available OTC products has been proven in the community, if the patient is too young, or if parents do not wish to use a pediculicide, consider the manual removal or an occlusive method with emphasis on careful technique, close surveillance, and repeating for at least 3 weekly cycles.
        iii. School personnel involved in detection of head lice infestation should be appropriately trained. The importance and difficulty of correctly diagnosing an active head lice infestation should be emphasized.
        iv. Head lice screening programs have not been proven to have a significant effect over time on the incidence of head lice in the school setting and are not cost-effective. Parent education programs may be helpful in the management of head lice in the school setting.

WHAT MNSD WILL DO

1. Track Data - Our school health offices track data to determine whether or not an "outbreak" of head lice is occurring based on the number of reported cases.
2. Inspect students - MNSD may inspect other known household contacts such as siblings attending the same school in an effort to stem outbreaks in other classes.
3. The District Nurse, in coordination with the building Principal and Health Office Staff, may consider classroom Head Lice Inspection if there are 5 or more cases of live lice in an individual classroom.
4. Inform and Educate - Parents/guardians of all elementary school children shall receive head lice information each school year. Information will be sent to middle and high school parents/guardians upon the discretion of the building Principal.
5. Head lice information shall be available upon request from each Health Office and/or District Nurse. Please go to the District Nurse page for resources.
6. An informational letter about head lice prevention, diagnosis, and treatment will go home to the parents/guardians of all students in a classroom if there are 5 or more cases of live lice in that individual classroom.
7. Train personnel - Health Room staff and others shall be properly trained in the detection and identification of head lice.

WHAT FAMILIES CAN DO

1. Inspect your children's hair several times a week for lice and/or their eggs (nits). This is important so the lice can be discovered early and treated. This should be done whether or not there are known lice in the school
2. If you suspect your child has head lice or if your child has been identified as having head lice, please consider reporting this information to your school. If this information is not shared with the school, we are unable to determine whether or not an outbreak is occurring.
3. Carefully follow the instructions when you use any treatment. Most require two treatments at a specific interval. Careful inspection, combing and nit removal between treatments intervals is may improve results.
4. If OTC lice treatments do not work, consult your health care professional for further guidance.

Please go to the MNSD DISTRICT NURSE page on the MNSD website for more information and resources. I hope you find this information useful regarding this common yet uncomfortable issue.

Tracy Staudacher JD, BSN, RN
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OVERVIEW OF TREATMENTS AND INTERVENTIONS

(Also available directly on the District Nurse page)

Ovicides kill nits (eggs) and Pediculicides kill live lice. Some preparations kill both. Information below is from the American Academy of PediatricsClinical Report on Head Lice Clinical Report on Head Lice

1. **Topical agents:** shampoos, creams, lotions
    1. Permethrin and Pyrethrin - Pediculicidal (kills live lice) only, not ovicidal (does not kill eggs/nits)
        1. Permethrin and Pyrethrin are neurotoxic to lice. They are not ovicidal because newly laid eggs do not have a nervous system for several days, thus 20% to 30% of eggs remain viable after treatment, which necessitates a second treatment to kill newly emerged nymphs hatched from eggs that survived the first treatment.
        2. Repeat the application sometime between days 7 to 10 after treatment if live lice are seen, new evidence based on the life cycle of lice suggests that retreatment at day 9 is optimal.
        3. An alternate treatment schedule on days 0, 7, and 13 to 15 has been proposed on the basis of the longest possible life cycle of lice for this and other non-ovicidal agents.
        4. Although Permethrin and Pyrethrin were extremely effective when introduced, recent studies indicate that efficacy has decreased substantially because of development of resistance. The prevalence of resistance has not been systematically studied but seems to be highly variable from community to community and country to country.
        5. Permethrin 1% (Nix) – introduced in 1986 by prescription and approved for OTC in 1990
            1. Applied to damp hair that is first shampooed with a non-conditioning shampoo and then towel dried.
            2. Left on for 10 minutes and then rinsed off.
            3. Permethrin leaves a residue on the hair that is designed to kill nymphs emerging from the 20% to 30% of eggs not killed with the first application.
            4. Conditioners and additives present in almost all currently available shampoos impair Permethrin adherence to the hair shaft and reduce its residual effect.
            5. Resistance to Permethrin has been reported but its prevalence is unknown.
        6. Pyrethrin Plus Piperonyl Butoxide (RID) - OTC
            1. Natural extract from chrysanthemums
            2. Available in shampoo or mousse formulations that are applied to dry hair and left on for 10 minutes before rinsing out.
            3. No residual pediculicide activity remains after rinsing.
    2. Malathion 0.5% (Ovide) – Reintroduced in 1999 – available by prescription, pediculicidal and ovicidal (kills eggs/nits)
        1. Lotion applied to dry hair, left to air dry, then washed off after 8 to 12 hours, although some study results have suggested effectiveness when left on for as short a time as 20 minutes.
        2. Head lice in the United Kingdom and elsewhere have shown resistance to malathion preparations, which have been available for decades in those countries. The current US formulation of malathion differs from the malathion products available in Europe in that it contains terpineol, dipentene, and pine needle oil, which themselves have pediculicide properties and may delay development of resistance.
        3. Malathion has high ovicidal activity and a single application is adequate for most but should be reapplied in 7 to 9 days if live lice are still seen.
        4. The high alcohol content of the product (78% isopropyl alcohol) makes it highly flammable; therefore, patients and their parents should be instructed to allow the hair to dry naturally; not to use a hair dryer, curling iron, or flat iron while the hair is wet; and not to smoke near a child receiving treatment.

5. Safety and effectiveness of malathion lotion have not been established in children younger than 6 years

3. Spinosad 0.9% (Natroba) - available by prescription
    1. Neurotoxic to live lice and lingers long enough to exert toxic effects on larvae after they develop nervous system.
    2. Applied to dry hair by saturating the scalp and working outward to the ends of the hair, (which may require a whole bottle), then rinsed 10 minutes after application.
    3. A second treatment is given at 7 days if live lice are seen.
    4. Safety in children younger than 4 years has not been established. Should not be used in neonates (<6 months)
4. Lindane 1% - no longer recommended by the American Academy of Pediatrics
5. Benzyl Alcohol 5% (Ulesfia) – available by Prescription
    1. Is not neurotoxic to the lice, but kills lice by asphyxiation. Not ovicidal.
    2. Should be applied topically for 10 minutes and repeated as stated previously for Permethrin
    3. Should not be used in neonates (< 6 months)
6. Vermectin 0.5% (Sklice) approved in in 2012 – available by prescription
    1. Neurotoxic to live lice and, while not ovicidal per se, when the treated eggs hatch, the lice are not able to feed as a result of paralysis and die
    2. One application is required
    3. Should not be used in neonates (<6 months)
7. Permethrin 5% cream (Elimite) - not currently approved by the FDA for use as a pediculicide but is used off-label for the treatment of head lice that seem to be refractory to other treatments. One study suggested that lice resistant to 1% Permethrin will not succumb to higher concentrations. Prescription only.
8. Crotamiton 10% lotion (Eurax) - not currently approved by the FDA for use as a pediculicide but is used off-label for the treatment of head lice that seem to be refractory to other treatments. One study showed it to be effective against head lice when applied to the scalp and left on for 24 hours before rinsing out. Other reports have suggested that 2 consecutive nighttime applications safely eradicate lice from adults. Safety and absorption in children, adults, and pregnant women have not been evaluated. Prescription only.

2. **Oral Agents:**
    1. Ivermectin (Stromectol) - Anti-parasitic agent (antihelmintic), used for roundworm infections. A single oral dose of 200 ug/kg, repeated in 10 days, has been shown to be effective against head lice.
        1. Most recently, a single oral dose of 400 ug/kg, repeated in 7 days, has been shown to be more effective than 0.5% malathion lotion. Ivermectin may cross the blood/brain barrier and block essential neural transmission; young children may be at higher risk of this adverse drug reaction. Therefore, oral ivermectin should not be used for children who weigh less than 15kg
    2. Sulfamethoxazole-Trimethoprim (Septra, Bactrim) - An antibiotic, has been cited as effective against head lice. Not currently approved by the FDA for use as a pediculicide.
        1. The results of 1 study indicated increased effectiveness when it was given in combination with permethrin 1%; however, the treatment groups were small. Rare severe allergic reactions (Stevens-Johnson syndrome) make it a potentially undesirable therapy if alternative treatments exist.
3. **Manual Removal:** Because none of the pediculicides are 100% ovicidal, nits should be removed manually after treatment with any product, especially the ones within 1 cm of the scalp. Nit removal can be difficult and tedious. Fine-toothed "nit combs" are available to make the process easier. Nit-removal combs are sold commercially. However, it appears that type of comb used is less important than that combing occurs after treatment, which may be most easily accomplished on wet hair. Studies have suggested that lice removed by combing and brushing are damaged and rarely survive.
4. **Other Remedies:**

1. **Natural Agents:** Such as essential oils have been widely used in traditional medicine for the eradication of head lice, but because of the variability of their constitution, the effects may not be reproducible. In addition, these oils (e.g., ylang ylang oil) may be a source of contact sensitization, which limits their use. Several products have been studied (e.g., Andiroba oil, Quassia vinegar, melaleuca oil [tea tree oil], lavender oil).
    1. As natural products, they are not regulated by the FDA and are not required to meet FDA efficacy and safety standards for pharmaceuticals.
    2. Although many plants naturally produce insecticides for their own protection that may be synthesized for use by humans, such as pyrethroids, some of these insecticidal chemicals produce toxic effects as well.
2. **Occlusive Agents:** Such as "petrolatum shampoo," mayonnaise, butter or margarine, herbal oils, and olive oil, applied to suffocate the lice are widely used but have not been evaluated for effectiveness in randomized controlled trials. To date, only anecdotal information is available concerning effectiveness.
3. The **AirAlle** device is a custom-built machine that uses one 30-minute application of hot air in an attempt to desiccate the lice. One study showed that subjects had nearly 100% mortality of eggs and 80% mortality of hatched lice. The machine is expensive, and the operator requires special training in its use. A regular blow dryer should not be used in an attempt to accomplish this result, because investigators have shown that wind and blow dryers can cause live lice to become airborne and, thus, potentially spread to others in the vicinity.
4. **Manual Removal** (exclusively): There is little peer-reviewed information in the literature about the benefits of the manual removal of live lice and nits, the inherent safety of the manual removal relative to the minor toxicity of the pesticides is real.
5. **Other Products**
    1. **Louse Combs:** Battery-powered "electronic" louse combs with oscillating teeth (MagiComb) that claim to remove live lice and nits as well as combs that resemble small bug zappers (Robi-Comb) that claim to kill live lice. No randomized, case-controlled studies have been performed with either type of comb. Their instructions warn not to use on people with a seizure disorder or a pacemaker.
    2. Some products are available that claim to loosen the "glue" that attaches nits to the hair shaft, thus making the process of "nit-picking" easier. Vinegar or vinegar-based products are intended to be applied to the hair for 3 minutes before combing out the nits. No clinical benefit has been demonstrated. This product has not been tested with and is not indicated for use with permethrin, because it may interfere with permethrin residual activity.
    3. A variety of other products, from acetone and bleach to vodka and WD40 have proved to be ineffective in loosening nits from the hair shaft and present an unacceptable risk.
5. **Highly flammable substances, such as gasoline or kerosene, or products intended for animal use, are never appropriate in treatment of head lice in humans.**
6. **Environmental Interventions**
    1. If a person is identified with head lice, all household members should be checked for head lice, and those with live lice or nits within 1 cm of the scalp should be treated.
    2. It is prudent to treat family members who share a bed with the person with infestation, even if no live lice are found.
    3. Fomite transmission (inanimate object/substance) is less likely than transmission by head-to-head contact; however, it is prudent to clean hair care items and bedding used by the individual with infestation.
    4. Only items that have been in contact with the head of the person with infestation in the 24 to 48 hours before treatment should be considered for cleaning, given the fact that louse survival off the scalp beyond 48 hours is extremely unlikely. Such items may include clothing, headgear, furniture, carpeting, and rugs. Washing, soaking, or drying items at temperatures greater than 130F will kill stray lice or nits. Furniture, carpeting, car seats, and other fabrics or fabric-covered items can be vacuumed.
    5. Although head lice are able to survive for prolonged periods in chlorinated water, it is unlikely that there is a significant risk of transmission in swimming pools. One study revealed that submerged head lice

became immobile and remained in place on 4 people infested with head lice after 30 minutes of swimming.

6. Viable nits are unlikely to incubate and hatch at room temperatures; if they did, the nymphs would need to find a source of blood for feeding within hours of hatching.
7. Although it is rarely necessary, items that cannot be washed can be bagged in plastic for 2 weeks, a time when any nits that may have survived would have hatched and nymphs would die without a source for feeding.
8. Exhaustive cleaning measures are not beneficial.

7. **School Interventions**
    1. Screening and Education
        1. Routine classroom or school wide screening is discouraged due to lack of efficacy.
        2. Screening for nits alone is not an accurate way of predicting which children are or will become infested, and screening for live lice has not been proven to have a significant effect on the incidence of head lice in a school community over time. In addition, such screening has not been shown to be cost-effective.
        3. In a prospective study of 1729 schoolchildren screened for head lice, only 31% of the 91 children with nits had concomitant live lice. Only 18% of those with nits alone converted to having an active infestation during 14 days of observation.
    2. Although children with at least 5 nits within 1 cm of the scalp were significantly more likely to develop an infestation than were those with fewer nits, 32% vs 7%, only one-third of the children at higher risk converted to having an active infestation. School exclusion of children with nits alone would have resulted in many of these children missing school unnecessarily.
    3. The results of several descriptive studies have suggested that education of parents in diagnosing and managing head lice may be helpful.
    4. Head lice infestations have been shown to have low contagion in classrooms.
    5. Parents are encouraged to check their children’s heads for lice regularly and if the child is symptomatic. School screenings do not take the place of these more careful parental checks.
    6. Criteria for Return to School
        1. A child should not be restricted from school attendance because of lice, head lice have low contagion within classrooms.
        2. "No-nit" policies that exclude children until all nits are removed may violate a child’s civil liberties and are best addressed with legal counsel for schools. However, most health care professionals who care for children agree that no-nit policies should be abandoned.
        3. International guidelines established in 2007 for the effective control of head lice infestations stated that no-nit policies are unjust and should be discontinued, because they are based on misinformation rather than objective science.
        4. The American Academy of Pediatrics and the National Association of School Nurses discourage no-nit policies that exclude children from school.
    7. Support by specially trained school staff
        1. Nit removal may decrease diagnostic confusion, decrease the possibility of unnecessary retreatment, and help to decrease the small risk of self-reinfestation and social stigmatization.
        2. School staff familiar with lice infestations, if present, can perform a valuable service by rechecking a child's head if requested to do so by a parent.
        3. Extra help may be offered to families of children who are repeatedly or chronically infested. In rare instances, it may be helpful to make home visits or involve public health nurses if there is concern about whether treatment is being conducted effectively.
        4. Parent education by school health professionals can reinforce similar goals for the home.