Objectives and instructions for completing the evaluation and statements of disclosure can be found on page 235.

Demystifying Pediculosis: School Nurses Taking the Lead

Deborah J. Pontius

The treatment of *Pediculosis capitis*, or head lice, is fraught with misinformation, myths, and mismanagement. Common myths include the need to exclude children from school, the need to remove all visible nits ("no-nit" policies), the need for massive environmental cleaning, that head lice live for long periods of time, and that schools are a common location for lice transmission. Head lice are a common childhood nuisance, causing embarrassment and emotional trauma in both children and families. This article explores and challenges the commonly held beliefs about the identification, management, and treatment of *Pediculosis* by presenting current recommended evidence-based practice. It also challenges pediatric nurses, and school nurses in particular, in alignment with the National Association of School Nurses (NASN) Position Statement on *Pediculosis* Management in the School Setting, to act as change agents for reasonable and effective school policies and practices.

Consider this scenario common five years ago: Nathan, a second grade student, was sent to the school nurse's office for a "head check" after his teacher noticed him frequently scratching his head. The nurse finds several tiny white objects on Nathan's hair, about an inch from the scalp. The nurse does not see any evidence of nits closer to the head, nor does she find any live lice. Per school policy, the nurse immediately calls his parents and requests they come to pick him up. His belongings are brought to the nurse's office. When his parents arrive, the nurse explains there is evidence that Nathan might have lice, and that he needs to be treated. She also explains the "no-nit" policy, meaning all nits must be removed from his hair before he returns to school. The nurse describes a treatment program that includes washing all the linen in the house, washing all of Nathan's clothing, putting all items that cannot be washed, such as stuffed animals, in a plastic bag for 10 days, and spraying an aerosol pediculicide or vacuuming all hard and soft household surfaces. The nurse also recommends the student and all members of the family be treated with a pediculicide. As an alternative, the nurse suggests a regime that includes either a mayonnaise treatment or a commercial lice removal service. The nurse proceeds to check the heads of all the students in Nathan's classroom and sends a letter home to notify the parents of Nathan's classmates of a case of lice in the classroom. Nathan's teacher asks the nurse to check her head and to sanitize headphones in her classroom.

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The problem with the scenario described above is that ***not one*** of the health care provider interventions is evidence-based best practice. Many school nurses across the county have successfully advocated their school boards to update their treatment of *Pediculosis* to reflect the current state of knowledge. Unfortunately, the scenario above is still all too common. This article will evaluate common head lice myths or traditional practices and present current evidence-based *Pediculosis* practice.

For the school community, *Pediculosis capitis*, or head lice, is a time consuming, seemingly never-ending problem. School children (presumed to be) with lice have been estimated to lose an average of four days of school per year in schools where "no-nit" policies are enforced (Gordon, 2009). This represents not only a loss of the opportunity for learning, but a loss of funding for schools and loss of parent work days as well. Nationwide, it has been estimated that schools lose between $280 to $325 million in annual funding, and families lose up to of $2,720 in wages per active infestation (Gordon, 2009).

Myth #1. Lice Are Easy To Get; They Are Easily Passed via Hats, Helmets, Or Hair Care Items; And Can Jump or Fly From One Person to Another

A head louse is a wingless insect with six legs; therefore, it cannot jump, fly, or even crawl long distances (Centers for Disease Control and Preventions [CDC], 2013a). Lice possess pincher-like grasping structures that allow them to hold on to the hair shaft quite tenaciously. Bathing, shampooing, or simple daily hair brushing cannot easily dislodge them (see Figure 1). The pincher actually adapts to hair shafts. In the U.S., the most common form of head lice species has adapted to the round Caucasian hair shaft (Frankowski & Bocchini, 2010). Lice are much less common among the oval-shaped hair shaft of the African-American child. A louse is mostly readily transmitted via head-to-head contact.

There is a very small theoretical possibility that hair care items may assist in the transmission of lice, although these insects are likely to be dead or injured. Therefore, it is pru-

dent to recommend not sharing hairbrushes, combs, or hair retainers, such as "scruchies" or ponytail holders. Slick helmets (e.g., bicycle helmets, football helmets, or baseball hats) pose no risk of transmission (Burgess, Pollack, & Taplin, 2003; CDC, 2013a; Frankowski & Bocchini, 2010; Pontius, 2011). Although bed linen may be a source of transmission, one study found live head lice on only 4% of the pillow cases used by an infested person (Speare, Cahill, & Thomas, 2003). Sharing beds is noted to be a significant risk factor for transmission. The extended time with heads being close to each other when bed sharing presents an opportunity for adult lice to crawl from one head to another (Burgess et al., 2003; Frankowski & Bocchini, 2010; Meinking & Taplin, 2011).

Symptoms of lice include tickling sensations, difficulty sleeping, sores on the head from scratching, and itching. Pruritus is caused by sensitization to components of the louse's saliva. With a first case, itching may not develop for three to six weeks, but with repeated cases, the pruritus develops much more quickly (Frankowski & Bocchini, 2010).

Myth #2. You Can Get Lice From Your Dog, Guinea Pig, or Other Animal

Human head lice (*Pediculosis humanus capitis*) are small parasitic insects that live on the scalp and neck hairs of *human* hosts. Although there are a number of other types of mammalian lice, they are all species-specific. Only humans can spread human lice. Humans can only acquire human lice (CDC, 2013a).

Myth #3. Head Lice Breed In Furniture, Carpets and Other Household Objects; You Must Treat the House To Eliminate Lice

People are infested with head lice, not things or places. A louse's entire existence is dependent upon the human host, and without this host, lice typically die within 24 hours (Meinking & Taplin, 2011). Eggs remain viable a bit longer, but as soon as hatched, they must feed on the human host, or they will die within hours. According to Richard Pollack, PhD, noted expert on parasitology and entomology, "I've seen nothing of an objective nature to suggest that fomites play any significant role in the transmission of head lice" (Burgess et al., 2003, p. 4).

Figure 1.
Gripping "Claw" of the Head Louse

Source: CDC Public Health Image Library, 2014.

If a child is determined to have a lice infestation, only items that have been in contact with the head of the person with the lice in the previous 24 to 48 hours prior to treatment should be considered for cleaning (Frankowski & Bocchini, 2010). This may include items of clothing worn near the head and possibly carpeting or rugs if the child was lying on them. Washing, soaking, or drying items at temperatures greater than 130° F will kill stray lice or nits. Cloth or carpeted items may be vacuumed. Although the risk is low, it is prudent to not share combs, brushes, or other hair care items. Pediculicide spray in the home is ***not*** necessary and should ***not*** be used. It provides unnecessary exposure to pediculicides to both infested and uninfested persons in the household, and can be can dangerous to infants (CDC, 2013a; Frankowski & Bocchini, 2010). The American Academy of Pediatrics (AAP) finds no benefit in "herculean cleaning measures" (Frankowski & Bocchini, 2010, p. 398).

Myth #4. Poor Hygiene And Low Income Are Associated with Head Lice

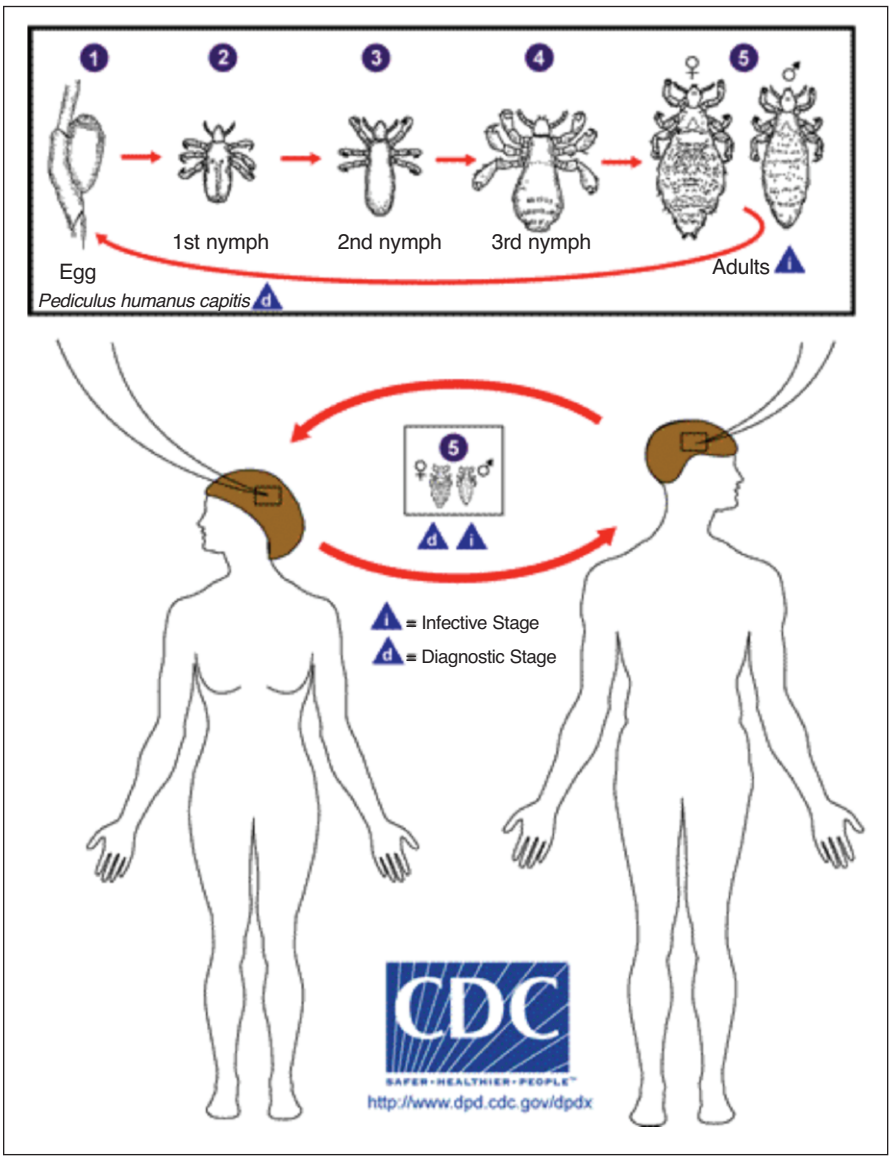
Head lice often infest people with good hygiene and grooming habits (CDC, 2013a). There is some evidence that *more* lice will be found on the head that is shampooed or brushed *less* often (Frankowski & Bocchini, 2010). However, regular hair hygiene will not eliminate nor prevent head lice, but may remove lice that are probably dead or dying (Pollack, Kiszewski, & Spielman, 2000). All socioeconomic groups are affected, and infestations are seen throughout the world. In the U.S., children in preschool and primary grades are affected more often, as are their caregivers and housemates. This is due to the opportunity for close, head-to-head contact (Burgess et al., 2003).

Myth #5. The Presence Of Nits/Eggs Indicates An Active Case of Lice

The three stages of the louse life cycle are egg/nit, nymph, and adult, and altogether, the life cycle lasts approximately 45 days (CDC, 2013a) (see Figure 2). The adult female louse lays up to 8 to 10 brown to yellowish colored eggs per day, which are cemented to the base of the hair shaft, most commonly found behind the ears or at the nape of the neck (see Figure 3). The color of the eggs may vary to match the color of the hair, making them very difficult to discover (Frankowski & Bocchini, 2010; Meinking & Taplin, 2011). Because of the cement-like attachment, they cannot "fall" off. Nymphs hatch in about one week, leaving behind a white-colored shell or nit. The nymph stage is also about one week in length, going through three molts to achieve adulthood (see Figure 4). The adult is the size of a sesame seed, is brown to gray or whitish in color, and will live for as many as 30 days (CDC, 2013a). Although some authorities refer to the "nit" as the non-viable shell only because it is difficult to ascertain true viability of a nit without microscopic examination, this article will use the more commonly ascribed definition of nit to include both viable eggs and hatched egg shells.

The presence of a live louse is considered the gold standard for an active infestation, not the mere presence of nits (Pollack et al., 2000; Meinking & Taplin, 2011). A viable nit is one that is closer than six millimeters (mm) to the scalp (CDC,

Figure 2.
Lifecycle of the Louse



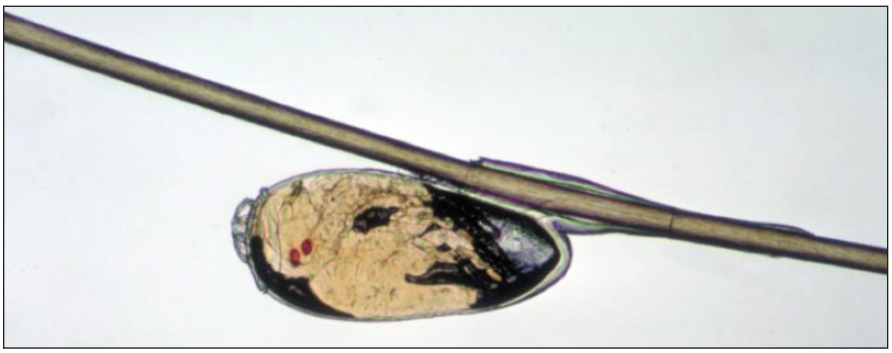
Source: CDC, 2013c.

2013a). Considering that nits do not move after being laid, that nits hatch in approximately seven days, and that hair grows and average of 13 mm (Caucasian) to 10 mm (African American) per month (Loussouarn, Rawadi, & Genain, 2005), and generously doubling the viability estimate (as it can be longer in warmer climates (Meinking & Taplin, 2011), most experts concur that nits found farther than one-fourth to one-half inches (6 to 12mm) from the scalp are non-viable (Frankowski & Bocchini, 2010; Mumcuoglu et al., 2007; National Association of School Nurses (NASN), 2011; Pollack et al., 2000). Lice are more common among girls, which may be due to longer hair hiding the infestation or a greater likelihood of playing with heads closer together (Burgess et al., 2003; Frankowski & Bocchini, 2010). By the time a case of lice is found, the child has generally had them for a month or more (Frankowski & Bocchini).

Myth #6. No-Nit Policies Reduce the Transmission Of Head Lice in Schools

Over the past decade, there have been important recommended changes in the management of head lice in schools: *No student should ever miss school time because of head lice, and no-nit policies should be eliminated* (CDC, 2013a; Frankowski & Bocchini, 2010; Mumcuoglu et al.,2007; NASN, 2011). Many schools have traditionally had "no-nit" policies, which require the removal of all nits, viable or not, before a child returns to school. To school personnel unfamiliar with the life cycle of the louse, school exclusion for an infestation or for the evi-

Figure 3.
Viable Nit



Source: CDC Public Health Image Library, 2014.

Figure 4.
Comparison of Egg, Nymph, and Adult

Source: CDC Public Health Image Library, 2014.

dence of nits seems logical. Their rationale may be that by excluding those who have head lice, others will not catch it. However, there is no evidence that these policies reduce the transmission of head lice in schools. Moreover, there is significant evidence they increase absenteeism, shame, stigma, and unnecessary treatment.

The Cost of "No-Nit" Policies

It has been estimated that school children with lice lose an average of four days of school per year in schools where "no-nit" policies are enforced (Gordon, 2009). The loss of the opportunity for learning, funding for schools, and parent/guardian work days result. Our nation's schools lose between $280 to $325 million in annual funding, and families lose up to $2,720 in wages per active infestation (Gordon, 2009). One study found that while the presence of more than five nits closer than one-quarter inch from the scalp *was* a risk factor for the development of an active infestation, most of these children did not actually become infested (Williams, Reichert, MacKenzie, Hightower, & Blake, 2001). Just the presence of nits does not indicate the presence of an active case of lice, especially if the nits are more than approximately one half inch (1 cm) from the scalp.

Even viable nits do not transmit lice. Eggs cannot be transmitted from one head to another, nor can they fall off the hair shaft. Even if hair with a viable nit falls off, it will not hatch at temperatures lower than the human head (Meinking & Taplin, 2011). Should environmental temperatures stay warm enough that the nymph actually hatches *off* the head, as an obligate ectoparasite and blood feeder, it must find a human host or rapidly succumb within 24 to 48 hours (Frankowski & Bocchini, 2010). There is no medical need to eliminate empty egg cases, but removal for esthetic reasons may reduce stigma (Burgess et al., 2003; Gordon, 2007). Additionally, the evidence shows both lay and health care personnel, even school nurses (who generally spend the most time of any health care professional assessing for lice) actually identify hair casts, hair product debris, dandruff, and other items found in the hair erroneously as lice or nits equally as often as they do so correctly (Pollack et al., 2000).

Exclusion for Live Lice

It also is no longer recommended to exclude children *immediately* for live lice or viable nits, but rather, to wait to notify parents/guardians at the end of the day. In most situations, the child has probably had lice for a month or more and possesses little risk to others (CDC, 2013a; Frankowski & Bocchini, 2010; Mumcuoglu et al., 2007). Any exposure to his or her classmates has already occurred, and immediate exclusion provides no further prevention. No exclusion from any activities is necessary, including riding the school bus or participating in sports.

Shame and Stigma

When a child is called to the nurse's office and does not return, and then a note goes home at the end of the day to check children for possible lice, it only takes a few questions from parents/guardians to determine which of their child's classmates has lice. For the child with persistent lice, the shame and stigma can be devastating not only to the child, but to the family as well. Children may be told they cannot play, sit by, or even be friends with the child who had/has lice. Head lice are not a health threat. Unlike body lice, head lice cause no known disease other than the occasional topical infection from persistent scratching, yet can cause a child to be socially ostracized (Gordon, 2007)

The Call for the Discontinuance

The following groups all call for elimination of "no-nit" policies:

- American Pediatrics Association (AAP) (Frankowski & Bocchini, 2010).
- Centers for Disease Control and Prevention (CDC, 2013a).
- International Guidelines for the Treatment of Pediculosis (Mumcuoglu et al., 2007).
- National Association of School Nurses (NASN, 2011).

According to D. Taplin, "If no nit policies were that effective, why do we still have so many head lice?" (Burgess et al., 2003, p. 11). However, eliminating "no nit" policies does not mean eliminating a need to treat the infestation. Whether by chemical or mechanical means, treatment to eliminate the head lice remains a high priority. Although not dangerous, infestation may be uncomfortable and should be managed.

Myth #7. Schools Are a Common Place for Lice Transmission

Surprisingly, schools rarely provide an opportunity for close head-to-head contact, except for very young children, such as preschool and kindergarten students. For that reason, schools are rarely a source for lice transmission. Head lice are most often a community health issue brought into the school setting. Speare, Thomas, and Cahill (2002) found that while 14,000 live lice were found on the heads of 466 children, no lice were found on the carpets of 118 classrooms. Hootman (2002) mapped classrooms of infested students, and found all students in the same classroom with lice shared time together outside of school with relatives, or household members, or had participated in a recent sleepover. Clothing stored next to each other, classroom headphones, riding on the bus together, and playing on the playground or in sports are also ***not*** sources of transmission (Burgess et al., 2003). The evidence indicates 1% to 10% of U.S. children (in kindergarten to fourth grade) have an infestation of head lice at any one time (Pollock et al., 2000). It is estimated that 10% of those may actually be transmitted in school. It does not make sense to exclude children when the likelihood of transmission in school is only 1%, far less than the common cold.

Schools often see a spike in cases after a school break, such as the beginning of the school year, after Christmas, and again after spring break. This is often falsely attributed to a return to the school environment, but is actually due to *being in the community* for an extended period of time (Gordon, 2007). These break times are commonly when children have sleepovers, go to camp, or visit relatives. They then return to school, and the teacher or school nurse who is familiar with the symptoms identifies the infestation. The school, rather than being the proximate cause of infestation, is the location of its identification.

Current recommendations include notifying parents at the *end* of the school day and providing education on the proper treatment. The child should be checked again the next school day. Should the parents be unable to provide necessary follow

through, further follow up, which may include financial assistance with pediculicides, additional education and how to check and comb out lice and viable eggs, referral for prescription treatment, or as a rare, very last resort, exclusion for non-compliance, may be appropriate (Frankowski & Bocchini, 2010; Pontius, 2011). A child should never lose a day at school because of lice.

Myth #8. Classroom Checks Can Limit Spread Of Head Lice in Schools

It is the position of NASN, the CDC, and AAP that school screenings, either routine or after an identified classroom case, are not productive, cost-effective, or merited, and are wasteful of education time (CDC, 2013a, Frankowski & Bocchini, 2010; NASN, 2011). School screenings are not an accurate way of assessing or predicting which children are or will become infested, and such screenings have not been proven to have a significant effect on the incidence of head lice in a school (Frankowski & Bocchini, 2010; Meinking & Taplin, 2011). One study found that misdiagnosis is so common that non-infested children were excluded from school *more* often than actually infested children (Pollack et al., 2000). Anecdotally, prior to the elimination of "no-nit" policies and classroom screening in her district, the author had conducted classroom screens whenever one student was found to have head lice. During eight years of such screenings, no further cases of lice were ever found that could not be attributed to close contact outside of school.

Screenings also have significant potential to violate the children's privacy. In schools, parents or guardians have a right to control access to their child's body. This could be violated by routinely screening students without parent/guardian permission. The National Pediculosis Association, a lay pediculosis interest group, continues to recommend the strict adherence to "no-nit" policies via nit combing and routine screenings as a way to eliminate the need any pediculicides. There is no published, reviewed evidence to support these claims (R. Pollack, personal communication, May 21, 2014).

It is prudent, however, to check close contacts of a child found to have head lice (Frankowski & Bocchini, 2010). A close contact includes all members of the household; those who have recently spent the night; family members who travel between households in blended families; children who spend large amounts of time outside of school with each other, such as day care, camp, or at babysitters; and preschool and kindergarten children who both sit near each other and play often together.

Myth #9. Letters to Parents Or Guardians When a Case Is Identified at School Are A Good Way to Control The Spread of Head Lice

There is no evidence to support the claim that letters sent home prevent head lice transmission, and they may, in fact, be a violation of privacy and confidentiality (American School Health Association [ASHA], 2000; Frankowski & Bocchini, 2010). There is no known method to *prevent* lice (other than by shaving the scalp hair). Sending home a letter may, as it should, cause parents to check their students to see if they are currently infested. However, this may also create a false sense of security because parents may believe their child is lice-free. There may be undetected, unhatched viable nits or one pregnant louse in the hair, or the child may spend the next night with friend who unknowingly has an infestation. Some parents/guardians will treat prophylactically, causing unnecessary use of pediculicides or time-consuming combing and environmental cleaning. Sending letters home often results in panic and emotional distress among caregivers. Letters home not only provoke a crisis situation and unjustified panic, but they perpetuate the myth that lice are transmitted in schools (Mumcuoglu et.al, 2007). However, some schools continue to send alert letters because while they may understand head lice are not a public health risk, they are concerned about a public relations dilemma and community backlash (Frankowski & Bocchini, 2010).

Confidentiality Violations

Parents or guardians often insist they have a right to know when a case of head lice is discovered in a classroom. Parents have also insisted they have a right to know when a child has HIV or other communicable condition in school. However, they do *not* have a legal right to such information. Although no school would send home a letter with a specific child's name in it, families can easily determine which child is suspected to have lice. This right to confidentiality in schools is protected by the Family Educational Rights and Privacy Act (FERPA), and by state and national ethical health care and education standards.

The Family Educational Rights and Privacy Act

FERPA requires that medical and educational records cannot, without parental/guardian consent, be released to others without a legitimate educational interest. This is regardless of whether the information is written, oral, or electronic (ASHA, 2000; Bergren, 2001). Even without disclosing the actual name, if another person can easily determine the identity of a child, then student privacy and confidentially has been violated. For example, if the nurse were discussing an issue at school about a child in a wheelchair and only one child is in a wheelchair at school, enough information has been provided to identify that child and breech his or her privacy, without ever mentioning a name. In a pediculosis situation, if after parents receive a lice alert letter they ask their own child who went home from school today and their child knows the answer, a similar breech has occurred.

National Ethical Standards And State Laws

Both the professions of education and nursing have developed codes of ethics that stipulate not disclosing information about students obtained within the course of professional service. For example, provision #3 in the American Nurses Association (ANA) Code of Ethics states "the nurse promotes, advocates for and strives to protect the health, safety and rights of a patient, which includes both privacy and confidentiality" (ANA, 2001, p. 6). Failure to uphold national professional standards can leave the nurse open to charges of malpractice.

Harm vs. Duty to Warn

According to ASHA (2000), when contemplating a disclosure of confidential health information even if by default, two ethical criteria must be met. The criteria and related consider-

ations as they pertain to head lice include:

Ethical Criteria 1: *Do no harm*. Consider the following:

- *Can the truth of the information be confirmed?* The literature reveals how frequently health care professionals error in the identification of head lice. True confirmation must be made by microscopy.
- *How much will the individual and his or her family's privacy be violated by this disclosure? Will it harm them?* Stigma, embarrassment, and social humiliation are common for those with head lice.
- *Will a decision to disclose do MORE harm than good to the individual with head lice?* Head lice are annoying, but they are not life threatening. Stigma, however, can change lives forever.

Ethical Criteria 2: *Duty to warn*. Consider the following:

- These circumstances are limited to very few situations when the potential for harm is high.
- Examples include child abuse, self-injury, or possible life-threatening or serious harm to another person.

Because head lice are not dangerous and do not cause disease, an infestation does not rise to the level of "duty to warn." Further, because disclosure, however inadvertent, may cause great harm to the family with head lice through social stigma, the right to privacy and confidentiality must be upheld for the student and family experiencing lice. Parents/guardians are better served rather than receiving alert letters, receiving regularly scheduled head lice information letters several times during the year (most appropriately at the times when children are returning from the community after school breaks). Suggested contents include reminders to regularly check their children's hair (weekly for elementary age students) for any evidence of head lice, how to check, and treatment instructions (Gordon, 2009).

Myth #10. If One Member Of the Household Has Lice, Everyone Should Be Treated

Treatment should be initiated only when there is clear evidence of head lice. When lice are identified in one family member, all household members and close contacts should be examined. Treat only those contacts that actually have crawling lice or viable eggs. Prophylactic treatment is unnecessary and time-consuming, and exposes persons to medications unnecessarily. All persons with head lice should be treated at the same time, otherwise they could re-infest each other (CDC, 2013a).

Myth #11. Pediculicides Are Dangerous and Should Be Avoided

Treatment choices for lice should be based on any local patterns of resistance, ease of use, and cost. Figure 5 describes a suggested treatment regimen. If the hair is fine and untangled, and the caregiver is motivated, using a fine-toothed comb and methodically combing through all hair on the head, both to examine the head for live lice, and to remove the viable nits and the lice, can be effective. This process must be repeated every few days for at least two weeks, to eliminate each new louse as it hatches. Because this is so time-consuming, and most families want the problem solved immediately, use of Federal Drug Administration (FDA)-approved pediculicides, which are safe when used as directed, can be used as an adjunct or to replace combing (Burgess et al., 2003; CDC, 2013a). The safety and effectiveness of home or "natural" remedies, such as olive oil, tea-tree oil, lavender oil, or mayonnaise, are not regulated by the FDA and have not been shown to be effective in any known double-blind studies, and are therefore not recommended (Frankowski & Bocchini, 2010)

Pediculicides

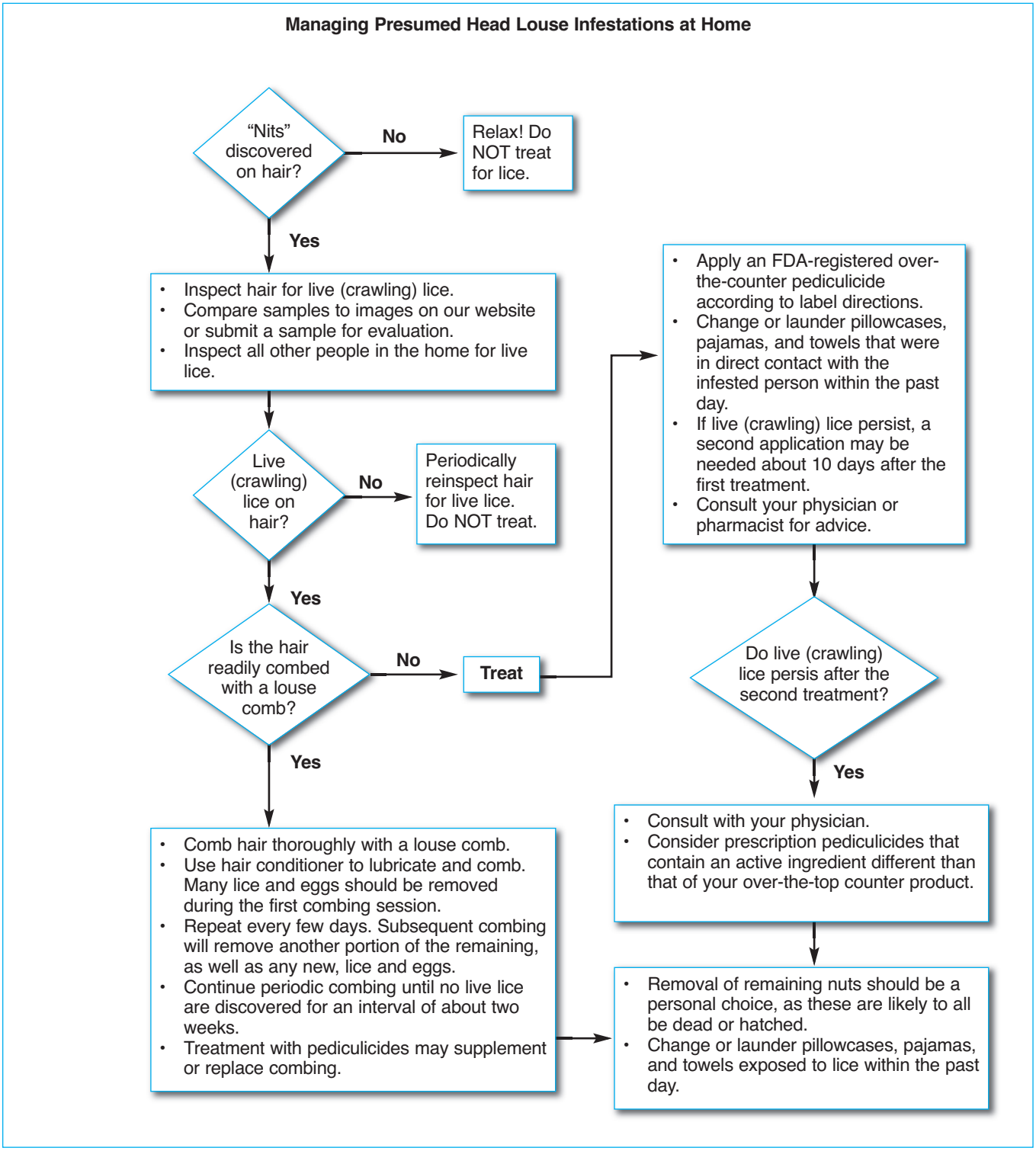
Over-the-counter (OTC) preparations or permethrin (e.g., Nix®) and pyrethrins (e.g., RID®, Clear®, Pronto®) remain as the first line choice for pediculicidal treatment. Even in light of some developing resistance to pyrethrins, they remain very effective. They are inexpensive and have extremely low toxicity. Pyrethrins are a natural chrysanthemum extract, and permethrin is a synthetic pyrethroid. Both are neurotoxic to lice (Frankowski & Bocchini, 2010).

Evidence has shown that many families rely on peers, and increasingly, the Internet, for their treatment information. In addition, families will self-treat an average of five times before seeking the help of a health care professional (Gordon, 2009). The cost of seeing a health care provider, plus the additional cost of a prescription medication and the stigma associated with head lice, are often the reasons many families will initially seek alternative information and treatments. Experts recommend referral to a health care provider after two treatment failures (Burgess et al., 2003). According to the treatment protocol recommended by the American Academy of Pediatrics (2012), "For treatment failures not attributable to improper use of an over-the counter pediculicide, malathion, benzyl alcohol lotion, or spinosad suspension should be used" (p. 4). Several prescription medications exist, with three new medications receiving FDA approval in the last five years (see Table 1). Each of these pediculicides must be used according to the directions. Some require a second treatment to ensure eradication of newly hatched nymphs. Others require an extended time on the head. The school nurse can help assure treatment success by making sure explanations of options and instructions for use are clear and understood by the caregiver. Finally, there is some evidence that a device that uses hot air to desiccate the insects may be effective (Frankowski & Bocchini, 2010). However, the device is expensive and not readily available.

Lice Removal Services

Delousing/nit picking services have expanded across the county in the last decade. These primarily for-profit businesses espouse to provide relief for families who are either unable or unwilling to do mechanical lice and egg removal, and/or prefer not to use pediculicides. However, unlike barbers and beauticians who also manipulate hair, such businesses are unregulated. Workers are not health care professionals and are generally trained by the establishment (Pollack, 2012). Noted lice expert Richard Pollack (personal communication, May 21, 2014) is unconvinced of the need for such services, and believes when the nature of the business is to sell head lice control services and proprietary supplies, it is not surprising to see these salons aggressively arguing in favor of no-nit policies, and perhaps suggesting that "out-

Figure 5.
Suggested Scheme for Head Louse Infestations



Source: © 2010 IdentifyUS, LLC. Used with permission. Retrieved from https://identify.us.com/idmybug/head-lice/head-lice-documents/lice-mgmnt-chart-home.pdf

Table 1.
Medications

	Age	Notes
Over-the-Counter Medications		
Permethrin lotion, 1%	2 months and older	• Kills live lice but not unhatched eggs. • A second treatment often is necessary on day 9 to kill any newly hatched lice before they can produce new eggs.
Pyrethrins	2 years and older	• Generally should not be used by persons who are allergic to chrysanthemums or ragweed. • 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.
Prescription Medications		
Benzyl alcohol lotion (0.5%)	6 months and older	• Kills lice but not eggs. • A second treatment is needed 7 days after the first treatment to kill any newly hatched lice before they can produce new eggs.
Ivermectin lotion, 0.5%	6 months and older	• Kills live lice and 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 health care provider.
Malathion lotion, 0.5%	6 years and older	• Kills live lice and some lice eggs. • A second treatment is recommended if live lice still are present 7 to 9 days after treatment.
Spinosad 0.9% topical suspension	4 years and older	• Kills live lice and unhatched eggs. • Retreatment usually not needed and should be given only if live (crawling) lice are seen 7 days after first treatment.

Source: Adapted from CDC, 2013b.

breaks" or "epidemics" of head lice are occurring. The cost can be quite expensive, with a session costing several hundred dollars or more. There is no evidence to support recommending these services.

Myth #12. Head Lice Are Becoming Increasingly Resistant to Pediculicides

Several studies have reported some increase in local resistance to OTC pediculicides in the last 20 years, receiving prominent lay press coverage. However, the prevalence of actual resistance is unknown because clinical trials have used different inclusion criteria, resulting in different conclusions (Frankowski & Bocchini, 2010; Pollack et al., 2000). Most recently, Yoon et al. (2014) found by DNA typing of lice in several locations in the U.S. and Canada, the rate of T1 mutation (the gene mutation most responsible for permethrin resistance) varied between 84.4% and 99%. While this suggests increasing resistance to permethrin and pyrethrins-based pediculicides, one must be careful in extrapolating these results because their study examined a small number of lice from only 12 U.S. states and studied the potential for resistance, rather than a clinical measurement of actual resistance. What matters most is the degree to which head lice have become resistant in each community (Burgess et al., 2003). Studies on resistance and efficacy are ongoing.

Resistance is often branded as the proximate cause of treatment failure when head lice are not eradicated by a pediculicide. However, these treatment failures are more commonly the result of:

- Misdiagnosis (no active infestation, or misidentification).
- Non-compliance (not following treatment protocol).
- New infestation (lice acquired after treatment).
- Lack of ovicidal (egg-killing) or residual properties of the product (Burgess et al., 2003; Frankowski & Bocchini, 2010).

Pollack et al. (2000) found the most common reason for a conclusion of "resistance" was actually misdiagnosis; therefore, it could not be effectively treated with a pediculicisde. Of the 555 samples sent in and initially identified as head lice, only 57.5% were correctly diagnosed and confirmed as such by an entomologist. Family identifications were only 47% correct, and physicians had the worst identification rate at 11% correct. The health care provider should consider resistance *after* assuring oneself the above factors have not contributed to the treatment failure.

Nurses as Change Agents

Pediatric nurses working both in and out of schools can lead the charge to help schools design evidence-based policies that respect the privacy and confidentially of students yet promote successful treatment of infestations. NASN, in its position statement regarding pediculosis (NASN, 2011), described that school nurses are the key health care professionals in the provision of education and anticipatory guidance in all aspects of the management of pediculosis in the school setting. Additionally, school nurses play an important roll in helping local pharmacists, health care providers, and community health districts in updating their knowledge of current state of pediculosis science. Providing education to reduce the stigma of lice, clarify myths, and provide accurate information about effective treatment options, as well as appropriate referrals to health care providers, is important nursing care. Table 2 gives an example of a parent-teaching tool, designed by the author using the principles of health literacy to effectively dispute the common myths of lice management. NASN provides free, professionally produced, evidence-based parent and nurse educational tools in their *Lice Lessons* program (visit http://www.nasn.org for more information).

Table 2.
Lice 101: Myths and Realities about Head Lice

Definitions	
Lice: More than one louse.	**Nit:** Eggs, dead or alive, of a louse
Louse: Small insect that lives on the scalp.	**Parasite:** Lives off another, in this case the blood of humans.
Pediculosis: Having an infestation of lice.	**Infestation:** Having an insect present, in this case, in your head.
Myths	**Truths**
Head lice are easy to get.	Lice are spread only mainly by head-to-head contact. They are much harder to get than a cold, flu, ear infection, pink eye, strep throat, food poisoning, or impetigo.
You can get lice from your dog, guinea pig, or other animal.	Lice are species-specific. You can only get human lice from another human. You cannot get another animal's lice.
You can get head lice from hats and helmets.	Rarely, but possible. Hairbrushes, pillows, and sheets are also uncommon modes of transmission.
School is a common place for lice transmission.	School is an unlikely source of transmission. Much more common are family members, overnight guests, and playmates who spent a large amount of time together.
Poor hygiene contributes to lice.	Hygiene makes absolutely no difference. You get lice by close personal head-to-head contact with someone else that has lice, not by being dirty.
Lice can jump or fly from one person to another.	Lice can only crawl. They can neither fly nor jump. They must crawl from one person to another.
Any nits left in the hair can cause lice to come back.	Any nits farther away than one quarter to one half on the hair shaft are ALREADY HATCHED and pose no risk to others.
Eggs or nits can fall out of the hair, hatch, and cause lice in another person.	Nits are cemented to the hair and very hard to remove. They cannot fall off. Newly hatched lice must find a head quickly or will die.
Lice can live a long time.	Lice live only 1 to 2 days off the head. Each louse only lives about 30 days on the head.
All members of a family should be treated if one person has lice.	Only the person with lice should be treated. Lice shampoos are INSECTICIDES and can be dangerous if used incorrectly or too frequently. Household members and close contacts should be checked, but only treat those who actually have lice. The house should NOT be sprayed with insecticide, nor used on clothing or other items.
Checking a classroom when one student has lice can prevent lice from spreading.	Classroom transmission is EXCEEDINGLY RARE and checking students is a waste of valuable teaching time. Checking family members and close playmates is much more appropriate.
Avoiding lice is important as they spread disease.	Head lice do not spread any known disease. They are annoying and irritating, but not dangerous.

Even in light of evidence to the contrary, the lay public, including teachers and school administrators, often remain unconvinced of the need to remove "no-nit" policies and will be unmotivated to do so on their own. Further, some experts believe the only hope for true success is to focus on the children. "Teach them to think, to evaluate conflicting bits of information and to form logical and rational conclusions, and to be compassionate and caring" (R. Pollack, personal communication, May 21, 2014) to help children develop a new reality about head lice. Armed with the evidence, school nurses are the perfect change agent to promote policy improvement to match what the evidence shows about the transmission and treatment of pediculosis. Not only can nurses provide education with every interpersonal encounter, they can lobby their school board. Following the examples set by leaders in school districts such as Oakland Unified, the author did just that (see Figure 6). Because many health care professionals are unaware of the realities of lice and newer lice treatments regimes, school nurses, as well as pediatric nurses in general, are in the ideal position to lead the charge!

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Figure 6.
Real Life Application

Using the evidence presented here, the author's district now allows both nits and live lice, does not send home specific alert letters, informs and educates parents/guardians at the end of the school day, and most importantly, provides copious teaching to families and children. In the four years hence, there has been no increase in infestation incidence, and although there is the occasional upset parent, overall the community has accepted these policies.

Source: Pontius, 2011.

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Instructions For Continuing Nursing Education Contact Hours

Demystifying Pediculosis: School Nurses Taking the Lead

Deadline for Submission: October 31, 2016

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Goal

To provide an overview of head lice and demystify the common misperceptions surrounding it.

Objectives

1. Define *Pediculosis capitis*.
2. List the common myths about head lice and nits.
3. Explain the implications these myths have on school children and their families.
4. Discuss ways school nurses may educate their community and schools about lice and nits, and thus, discourage the enforcement of "no-nit" policies.

Statement of Disclosure: The author(s) reported no actual or potential conflict of interest in relation to this continuing nursing education activity.

The *Pediatric Nursing* Editorial Board members reported no actual or potential conflict of interest in relation to this continuing nursing education activity.

This independent study activity is provided by **Anthony J. Jannetti, Inc.** (AJJ).

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This article was reviewed and formatted for contact hour credit by Rosemarie Marmion, MSN, RN-BC, NE-BC, Anthony J. Jannetti, Inc., Education Director; and Judy A. Rollins, PhD, RN, *Pediatric Nursing* Editor.