



In Over My Head [Lice]: How to Manage the Not so Nice

Lauren B. Angelo, PharmD, MBA
Associate Professor, Pharmacy Practice
Associate Dean, Academic Affairs

Sneha Baxi Srivastava, PharmD,
BCACP, CDCES, DipACLM, FADCES
Associate Professor/Associate Director of Skills Education

Rosalind Franklin University of Medicine & Science
College of Pharmacy



1

Disclosures and Conflict of Interest

Drs. Angelo and Srivastava declare no conflicts of interest, real or apparent, and no financial interests in any company, product, or service mentioned in this program, including grants, employment, gifts, stock holdings and honoraria.



2

Disclosure of AI Use

Artificial Intelligence was not used in development of this presentation.



3

Pharmacist Objectives

At the conclusion of this program, the pharmacist will be able to:

1. Identify the signs and symptoms of pediculosis capitis (head lice)
2. Apply the recent addition to the Illinois Pharmacy Practice Act on pharmacist responsibilities, specifically in the context of head lice screening and treatment
3. Describe the prevention and treatment options available for pediculosis capitis
4. Provide holistic patient education about pediculosis management and prevention



4

Technician Objectives

At the conclusion of this program, the technician will be able to:

1. Identify the signs and symptoms of pediculosis capitis (head lice)
2. Describe the recent addition to the Illinois Pharmacy Practice Act on pharmacist responsibilities, specifically in the context of head lice screening and treatment
3. List the prevention and treatment options available for pediculosis capitis
4. Refer patients to pharmacists for holistic patient education about pediculosis management and prevention



5

Pre-Assessment Question 1

Which of the following is the most common symptom of pediculosis?

- A) Swollen lymph nodes in the neck
- B) Red papules on the scalp and neck
- C) Itchy scalp
- D) Diffuse erythematous rash on scalp and neck



6

Pre-Assessment Question 2

In terms of the adult-stage head louse, what does the Illinois Pharmacy Practice Act permit pharmacists to do?

- A) Bill Medicare and Medicaid at 40% the physician rate
- B) Teach patients the Nuvo Method for removal
- C) Establish heat therapy clinics
- D) Provide screening and treatment



7

Pre-Assessment Question 3

Which of the following head lice treatments does not require combing for nit removal?

- A) Topical ivermectin
- B) Dimethicone
- C) Permethrin
- D) Synergized pyrethrins



8

Pre-Assessment Question 4

Which of the following recommendations should be included in the post-treatment education plan for lice?

- A. Wash all bedding, clothing, and hats in hot water, and dry them on high heat.
- B. Comb three times a day with a nit comb to remove all the eggs from the hair.
- C. Keep your child at home for 3 days to ensure they are no longer contagious.
- D. Immerse hair brushes in ice water to ensure lice and nits are eliminated.



9

Let's Meet Gwen and Lydia



Hi - can you help me? My daughter Lydia has been telling me that her hair feels itchy. I didn't see anything when I looked in her hair - but I'm wondering if I should buy one of those lice shampoos anyways, just to be safe



10

Illinois Pharmacy Practice Act Update

- "Practice of pharmacy" means . . . the ordering and administration of point of care tests, screenings, and treatments for . . . **adult-stage head louse**
- The testing, screening, and treatment ordered . . . by a pharmacist **shall not be denied reimbursement** under health benefit plans that are within the scope of the pharmacist's license and shall be covered as if the services or procedures were performed by a physician, an advanced practice registered nurse, or a physician assistant.
- Payment for services by Illinois (IL) Medicaid or other third-party insurers remains to be determined
- Rules have yet to be published

Illinois Compiled Statutes, 225 ILCS 85.3.17



11



Head Lice: Where They Hide & How to Find Them



12

Epidemiology



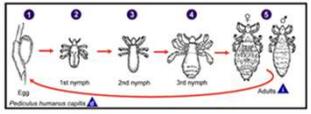
- Common worldwide, unaffected by socioeconomic status
- Prevalence ranges from 0% to 64.1% globally; 1.6% of U.S. children have head lice, and 3.6% have nits.
- Can infest all hair types!
- No significant link between infestation and hair length or brushing/shampooing

Nolt D, et al. *Pediatrics*. 2022;150(4):e2022059282



13

Lice: Life Cycle



Day 0
• hair shaft has louse egg laid

Days 6-7
• louse hatches

Days 8-9
• 1st molt

Days 11-12
• 2nd molt

Days 16-17
• 3rd molt

Days 17-18
• reproduction

Days 19-22
• 1-2 eggs laid; 4-8 eggs/day continue to be laid for 16 days

Days 33-35
• louse dies

Tackling lice, pick your poison. *The Derm Digest*. Accessed July 8, 2025. <https://thedermdigest.com/tackling-lice-pick-your-poison/>.
Image: CDC. DPDx – Pediculosis. Accessed July 8, 2025. <https://www.cdc.gov/dpdx/pediculosis/index.html>



14

Head Lice




B. Nits (lice eggs) on hair

Image used with permission of the American Academy of Dermatology National Library of Dermatologic Teaching Slides

CDC. About Head Lice. Updated June 4, 2024. Accessed July 8, 2025. <https://www.cdc.gov/lice/about/head-lice.html>



15

Head Lice: Clinical Presentation

No Symptoms	Itching (Most Common Symptom)	Additional Symptoms
<ul style="list-style-type: none"> • Seeing bugs • Finding lice eggs 	<ul style="list-style-type: none"> • Tickling feeling • Sensation of something moving in the hair 	<ul style="list-style-type: none"> • Irritability • Sleeplessness • Scratching → sores on head → may become infected • Pink eye • Swollen lymph nodes

CDC. About Head Lice. Updated June 4, 2024. Accessed September 10, 2025. <https://www.cdc.gov/lice/about/head-lice.html>; American Academy of Dermatology Association. Head Lice: Signs and Symptoms. Accessed September 29, 2025. www.aad.org/public/diseases/a-z/head-lice-symptoms



16

Treatment Options

Prescription Only	Nonprescription	Alternative Options
<ul style="list-style-type: none"> • Malathion • Spinosad 	<ul style="list-style-type: none"> • Ivermectin (topical) • Permethrin • Synergized pyrethrins 	<ul style="list-style-type: none"> • Dimethicone



17

Prescription Medications



18

Malathion (Ovide®) Lotion 0.5%

Mechanism of Action	<ul style="list-style-type: none"> • Organophosphate cholinesterase inhibitor • Neurotoxic to head lice and highly ovicidal
Age approval	<ul style="list-style-type: none"> • For use in ages 6 years and older
Side Effects	<ul style="list-style-type: none"> • May cause 2nd-degree chemical burns and stinging of the skin
Precautions	<ul style="list-style-type: none"> • Pregnancy: Category B - Use (and handle) only if needed • Breastfeeding: excretion in breastmilk is unknown – use caution
Warnings	<ul style="list-style-type: none"> • High alcohol content — flammable

Brand name product discontinued in 2019 – generic products may still be available

Ovide [package insert], Haifa Bay, Israel: Taro Pharmaceutical Industries Ltd.; December, 2011; Nolt D, et al. *Pediatrics*. 2022;150(4):e2022059282.; FDA. Determination That OVIDE (Malathion) Lotion, 0.5%, Was Not Withdrawn From Sale for Reasons of Safety or Effectiveness. Federal Register. May 14, 2021. Accessed June 30, 2025. www.federalregister.gov/documents/2021/05/14/2021-10160/determination-that-ovide-malathion-lotion-05-was-not-withdrawn-from-sale-for-reasons-of-safety-or



19

Malathion Efficacy

- 7 days following treatment, live lice were not present in 114 of 126 patients (90%), compared to vehicle only (31/105, 30%)
- 10 minutes following malathion exposure in a Petri dish, 100% of live lice were dead
- 14 days following malathion exposure in an incubated setting, 0% of nits hatched

Ovide [package insert], Haifa Bay, Israel: Taro Pharmaceutical Industries Ltd.; Meinking TL, et al. *Arch Dermatol*. 2001;137(3):287-292.



20

Malathion Application

- Apply to **DRY** hair in an amount just sufficient to thoroughly wet hair and scalp.
- Be sure to get the back of the head and neck
- Wash hands immediately after the application process is complete.
- Allow hair to dry naturally and to remain uncovered—do not use a heat source
- **Shampoo** hair after **8 to 12 hours**
- Rinse hair and use a fine-toothed (nit) comb to remove dead lice and eggs
- If lice are still present after 7-9 days, repeat with a second application

Ovide [package insert]. Haifa Bay, Israel: Taro Pharmaceutical Industries Ltd.; December, 2011.



21

Spinosad (Natroba™) Topical Suspension 0.9%

Mechanism of Action

- A pediculicide and scabicide derived from the fermentation of a soil actinomycete bacterium, *Saccharopolyspora spinosa*
- Causes neuronal excitation in lice, resulting in paralysis and death

Age approval

- Approved for ages 6 months and older

Side Effects

- May cause skin redness and irritation, eye redness, dry skin, alopecia, skin exfoliation

Precautions

- Pregnancy: likely safe
- Breastfeeding: likely safe when applied to the head

Other information

- No evidence of systemic absorption

Natroba [package insert]. Carmel, IN: ParaPRO LLC.; April, 2021.

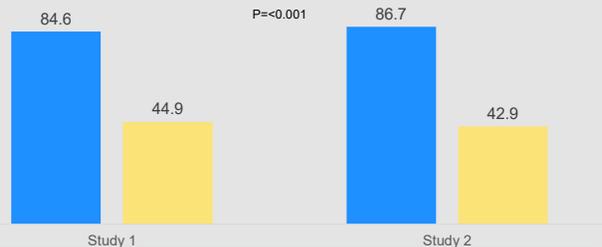


22

Spinosad versus Permethrin

Percent of Patients Lice-Free after 14 Days

■ Spinosad (n=91 & 83) ■ Permethrin (n=89 & 84)



Note: patients who used spinosad did not comb, patients who used permethrin combed after use

Adapted from: ParaPRO. Natroba (Spinosad) Topical Suspension, 0.9%. Accessed June 30, 2025. www.natroba.com/head-lice/todays-standard-of-care/



23

Spinosad Application

- Shake bottle prior to application
- Apply spinosad to **DRY** hair
- Wash hands immediately after application
- Leave on hair and scalp for **10 minutes**
- Rinse with warm water
- Combing may be done, but is not required
- If lice are still present after 7 days, repeat with a second application

Natroba [package insert]. Carmel, IN: ParaPRO LLC.; April, 2021



24

Nonprescription Medications



25

Permethrin (Nix®)

Mechanism of Action	<ul style="list-style-type: none"> Synthetic pyrethroid that works by disrupting the sodium channels in lice, leading to paralysis and death. Effective against adult lice and nymphs, but not always the nits (eggs).
Age Approval	• ≥ 2 months
Efficacy	• 83% lice-free day 2, 46% day 8 before a second treatment; increasing to 78% day 9 after 2nd treatment; remaining at 78% percent on day 15
Side Effects:	<ul style="list-style-type: none"> Mild scalp irritation or redness. Rare: allergic reactions (e.g., swelling, itching, rash). Eye irritation if accidentally splashed into eyes.
Precautions	• May cause breathing difficulties if ragweed allergy; cross sensitivity allergy with chrysanthemums

Meinking TL, et al. J Pediatr. 2002;141(5):665.



26

Permethrin Application

- Wash hair with a shampoo without conditioner. Do not use a shampoo that contains a conditioner or a conditioner alone since this may decrease the activity
- Rinse with water.
- Towel dry hair so it is **DAMP** but not wet
- Shake the bottle of medication
- Completely saturate the hair and scalp -apply behind the ears and at the back of the neck.
- Leave on the hair for **10 minutes**, but no longer
- Rinse with warm water
- Towel dry hair and comb out tangles
- If live lice are seen** seven days or more after the first treatment, a **SECOND TREATMENT** should be given

Permethrin. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=cca42777-01bf-4352-acdb-441160d69557>. Accessed July 10, 2025.



27

Pyrethrin and Piperonyl Butoxide (various store brands, A.K.A. synergized pyrethrins)

Mechanism of Action	<ul style="list-style-type: none"> Derived from the chrysanthemum flower Works by affecting the nerve cell membranes of lice → paralysis and death Piperonyl butoxide = synergist to enhance pyrethrin's potency
Age Approval	• ≥ 2 years old
Efficacy	<ul style="list-style-type: none"> 62-94% are lice free (unclear of time frame) Resistance 59% (CI95%: 50%–68%)
Side Effects	<ul style="list-style-type: none"> Mild scalp irritation or redness Rare: allergic reactions (e.g., swelling, itching, rash) Eye irritation if accidentally splashed into eyes
Precautions	• Not recommended if allergic to chrysanthemums

Abbasi E, et al. Heliyon. 2023;9(6):e17219. doi:10.1016/j.heliyon.2023.e17219



28

Pyrethrin and Piperonyl Butoxide Application

- Apply thoroughly to **DRY HAIR**
- Be sure to apply behind ears and to back of neck.
- Allow product to remain for **10 minutes**, but no longer
- Use warm water to form a lather, shampoo, then thoroughly rinse
- Towel dry hair and comb out tangles
- Remove lice and their eggs via combing
- **Second treatment MUST** be done in **7 to 10 days** to kill any newly hatched lice

Pyrethrin. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/druginfo.cfm?setid=3d927d10-6d82-1cab-e054-00144ff68e88>. Accessed July 10, 2025.



29

Ivermectin (Sklice®) Lotion 0.5%

Mechanism of action

- A pediculicide derived from the fermentation of a soil dwelling actinomycete, *Streptomyces avermitilis*
- Causes an increase in chloride ion permeability of cell membranes, resulting in hyperpolarization, paralysis, and death of the parasite

Age approval

- For use in ages 6 months and older

Side effects

- May cause skin irritation and burning sensation, dandruff, dry skin, eye irritation and redness

Precautions

- Pregnancy: likely low risk, but other agents preferred
- Breastfeeding: unknown if present in breast milk — likely compatible

Other information

- Switched to nonprescription status October 27, 2020

Note that ivermectin oral tablets are available via prescription for cases resistant to all FDA-approved topical treatments

FDA. Prescription to Nonprescription Switch List. Updated July 16, 2024. Accessed June 30, 2025. www.fda.gov/about-fda/center-drug-evaluation-and-research-cder/prescription-to-nonprescription-switch-list. Sklice [package insert]. Atlanta, GA: Arbor Pharmaceuticals, LLC.; June 2017.; Noll D, et al. *Pediatrics*. 2022; 150(4):e2022089282. ; Workowski KA, et al. *MMWR Recomm Rep*. 2021;70(4):1-187.



30

Ivermectin Efficacy

Percent of Patients Lice-Free after 14 Days

■ Ivermectin (n=71 & 70) ■ Vehicle (n=74 & 74)



Adapted from: Sklice [package insert]. Atlanta, GA: Arbor Pharmaceuticals, LLC.; June 2017.



31

Ivermectin Application

- Apply ivermectin to **DRY** hair
- Completely cover hair and scalp — discard excess
- Rub product throughout hair and completely coat each hair from scalp to tip
- Leave on hair and scalp for **10 minutes**
- Rinse with warm water
- Combing may be done, but is not required
- Wait 24 hours before applying shampoo
- **Do not repeat** application without consulting a health care provider
- If lice still present after 7 days, a different treatment is recommended

Sklice [package insert]. Atlanta, GA: Arbor Pharmaceuticals, LLC.; June 2017.; Sklice-ivermectin lotion. National Library of Medicine. DailyMed. Accessed June 30, 2025. Available at <https://dailymed.nlm.nih.gov/dailymed/druginfo.cfm?setid=7579bdfc-a538-4bff-b7c7-df2c4b6f13db>.



32

Alternative Options

33

Alternative Methods

<p>Occlusive Methods*</p> <ul style="list-style-type: none"> Mayonnaise Coconut Oil or Olive Oil Tea Tree Oil Lavender Oil Petroleum Jelly 	<p>Additional Methods</p> <ul style="list-style-type: none"> Wet Combing Heat Clinics Dimethicone Rubbing Alcohol Neem oil Vinegar
--	---

*efficacy variable, not considered to be evidence based

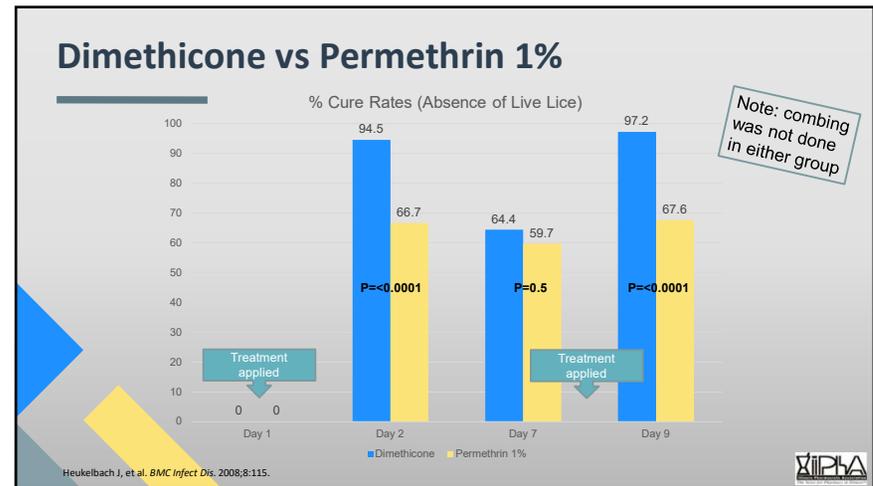
34

Dimethicone

- Widely used in Europe
- Not FDA approved
- Non-pesticide, silicone-based product that coats lice and disrupts their ability to manage water
- Available as a line extension in popular nonprescription products
- Marketed as safe and non-toxic
- Resistance is unlikely
- WARNING: flammable

Pediculosis capitis. In: UpToDate Lexidrug. Wolters Kluwer Waltham, MA. Updated October 12, 2022. Accessed June 30, 2025. www.uptodate.com.; Prestige Consumer Healthcare Inc. Nix Ultra® Lice Treatment Hair Solution. Accessed June 30, 2025. www.nixlice.com/lice-products/nix-ultra-super-lice-treatment#directions

35



36

Dimethicone Application

- Apply dimethicone to **DRY** hair
- Completely cover hair and scalp
- Leave on hair and scalp for **10 minutes**
- Wash hair with shampoo — avoid using conditioner
- Towel dry hair
- Rinse hair and use a fine-toothed (nit) comb to remove lice and eggs
- If lice are still present after 7 days, repeat with a second application

Prestige Consumer Healthcare Inc. Nix Ultra® Lice Treatment Hair Solution. Accessed June 30, 2025. www.nixlice.com/lice-products/nix-ultra-super-lice-treatment#directions



37

Lice Clinics: Heat Method or Removal Methods

- May use heat or combing methods; be at a location or will come to the home
- Heat: typically use non chemical heat treatment to dehydrate and kill lice and nits
 - Controlled, heated air (around 130°F or 54°C) directly to the hair and scalp for 30-45 minutes
- Considerations: efficacy, safety, cost
- Example devices used:
 - AirAllé™, LouseBuster™



Image: <https://airalle.com/airalle/>. Accessed July 10, 2025.
https://commons.wikimedia.org/wiki/File:LouseBuster_treatment.JPG. Accessed July 10, 2025.



38

Treatment Selection



39

Treatment Selection for Head Lice

Age Approvals	Low to No Resistance	Combing Unnecessary	One-Time Treatment	Pregnant or Breastfeeding
<ul style="list-style-type: none"> • ≥2 months: Permethrin • ≥6 months: Ivermectin, Spinosad • ≥2 years: Synergized pyrethrins • ≥6 years: Malathion 	<ul style="list-style-type: none"> • Ivermectin • Spinosad • Malathion • Dimethicone 	<ul style="list-style-type: none"> • Ivermectin • Spinosad 	<ul style="list-style-type: none"> • Ivermectin 	<ul style="list-style-type: none"> • Permethrin and wet combing as first line



40

Treatment of Lice in Pregnancy

Ivermectin

- Classified as "human data suggest low risk" during pregnancy and probably compatible with breastfeeding

Malathion

- Aqueous formulations likely safe in pregnancy - use after safer options like permethrin
- Studies totaling > 29,000 people who were pregnant: no increased risk of birth defects or developmental issues

Permethrin

- Safe and first-line for topical treatment
- < 2% topical permethrin is systemically absorbed; animal and human studies (n=309) show no fetal harm

Other Agents

- Evidence and data is lacking about other medications
- Overall, dimethicone and pyrethrins may be considered safe to use

Patel VM, et al. *Indian J Dermatol.* 2016;61(6):583-587. doi:10.4103/0019-5154.193659. Workowski KA, et al. *MMWR Recomm Rep.* 2021;70(4):1-187.



41

Gwen & Lydia: Patient Education



42

General Patient Education: Shampoo Products

Read specific instructions on label!

Read directions on the package

- Each product has specific instructions

Application of Shampoo

- Ensure saturation of hair and scalp
- Apply to areas behind ears and nape of the neck

Time

- Leave on for recommended amount of time (typically 10 minutes) – set a timer
- Too long versus too little time?

Rinse

- Rinse thoroughly with warm water
- Do not shampoo/condition for 24-48 hours

Combing—Depends on the product

Repeat —Depends on the product

43



43

General Patient Education: Combing



Lighting & Preparation:

- Ensure good lighting.
- Cover the patient's shoulders with a light towel.

Hair Preparation:

- Wet the hair or wash it with shampoo.
- Detangle using a wide-tooth comb.
- Conditioner** may be used to ease detangling unless treatment instructions advise against it.

Combing Process:

- Switch to a **nit comb**.
- Divide hair into small sections.
- Comb each section from **scalp to ends**, checking the comb after each stroke.
- Remove lice/nits from the comb by rinsing in **soapy water** and wiping with towel/tissue.
- Repeat combing several times per section.
- Use a spray bottle to keep hair damp if needed.

Post-Combing:

- Soak combs and towel in **hot water (>130°F)** for 5–10 minutes.
- Wash and dry towels/clothing on a hot dryer cycle

44



44

General Patient Education

- Machine wash with hot water (130°F) and high heat dry clothes, beddings, and items used in the two days before treatment.
- Anything that cannot be washed or dry cleaned: seal them in a plastic bag for two weeks.
- Soak combs and brushes in hot water (at least 130°F) for 5 – 10 minutes.
- Vacuum floor, furniture, and mattresses.

CDC. Treatment of Head Lice.. Updated November 12, 2024. Accessed August 15, 2025. <https://www.cdc.gov/lice/treatment/index.html>

45

Guidelines about School

Were you sent home from school for head lice? Here's why that's no longer recommended

- Head lice should not restrict school attendance due to low contagion risk in classrooms.
- No-nit policies
 - May violate civil liberties and should be reviewed with legal counsel.
 - HCPs agree that these should be abandoned due to lack of scientific support.
 - International guidelines and organizations (AAP, NASN) discourage
- CDC resources offer information to counter no-nit policies.
- School nurses can assist by rechecking students' heads privately if requested by caregivers.
- Nurses can provide extra support for families of children with chronic infestations.

Nolt, D et al. , Moore, S., Yan, A. C., Melnick, L., Committee on Infectious Diseases, Committee on Practice and Ambulatory Medicine, Section on Dermatology. (2022). *Head Lice. Pediatrics*, 150(4), e2022059282. <https://doi.org/10.1542/peds.2022-059282>; <https://www.nprillinois.org/2022/08/28/were-you-sent-home-from-school-for-head-lice-heres-why-thats-no-longer-recommended>

46

A Case of Itchy Heads

Triad Case Instructions:

- Sit in groups of 3
- Assign the roles of patient, pharmacist, and observer
- Patient – take 1 to 2 minutes to review your situation (see handout and prop)
- Pharmacist – take 1 to 2 minutes to collect your thoughts regarding the situation presented (see PPT slide)
- Observer – take 1 to 2 minutes to review the feedback form (see handout)
- Spend 10 minutes assessing the patient and provide treatment recommendations

47

Case: Itchy Heads

An adult is standing at the pharmacy counter holding a plastic bag that contains tiny bugs and shows you an image on their phone:

Image from: California Department of Public Health. Head Lice. www.cdph.ca.gov/Programs/CID/DCDC/Pages/HeadLice.aspx

48

Roles of Pharmacists and Pharmacy Technicians in Managing Pediculosis

Task	Technicians	Pharmacists
Be familiar with products available	☑	☑
Triage patients and caregivers who present with questions or symptoms	☑	☑
Refer patients to pharmacists for product selection and counseling	☑	
Assist with product selection		☑
Counsel patients regarding use of product and nonpharmacologic strategies		☑

"[P]harmacists support the rational selection, administration and responsible use of self-care products, together with the provision of individual counselling, support and follow-up for safety and efficacy." -FIP. Self-Care and Management of Common Ailments. <https://selfcare.fip.org/>



49

Conclusion

- While itching is the most common complaint with head lice, it is diagnosed when live lice are found on the scalp or hair
- Illinois has expanded the role of pharmacists in the assessment and treatment of head lice in the Pharmacy Practice Act
- Treatment selection for head lice is based on age, resistance in the community, and patient preference in terms of combing and number of treatments
- Patient education regarding head lice management should include both product use instructions and prevention measures in the home



50

Questions???



51

Head Lice: Resources and References

- CDC — About Head Lice — www.cdc.gov/lice/about/head-lice.html
- Product Labels — <https://dailymed.nlm.nih.gov/dailymed/>
- Head Lice Clinical Review Article — Nolt D, Moore S, Yan AC, Melnick L; Committee on Infectious Diseases, Committee on Practice and Ambulatory Medicine, Section on Dermatology. Head Lice. *Pediatrics*. 2022;150(4):e2022059282. doi:10.1542/peds.2022-059282 <https://publications.aap.org/pediatrics/article/150/4/e2022059282/189566/Head-Lice>



60



Thank you

Lauren B. Angelo, PharmD, MBA
Sneha Baxi Srivastava, PharmD,
Rosalind Franklin University of Medicine & Science
College of Pharmacy

