What’s Bugging (and Biting) ME?:
Addressing Ticks and Other
Health-Risk Pests at School

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Maine School IPM Program
Maine Department of Agriculture, Conservation and Forestry
outline

- What is Integrated Pest Management and why must your schools use it?
- Nurses role
- Prevention and response protocols for health-impacting pests
- Resources
Pests Can Pose Health Risks

- Respiratory illness (mice, mold, roaches, caterpillars)
- Rashes and bites (caterpillars, bed bugs, ticks, fleas, lice)
- Vectored diseases (ticks, mosquitoes)
- Spread pathogens (roaches, mice, flies)
- Stings (ants, bees & wasps)
Pesticides Pose Risks Too

- 20,116 people treated in health care facilities/yr.
- 7385 ER visits/yr; 1419 hospitalizations/yr.
- US pesticide exposures cost nearly $200 mill/yr (based on data from emergency department visits, hospitalizations, and deaths*)
- Pesticide exposures remain a significant public health issue.

*Excluding costs from lost work time, hospital physician fees, and pesticide-induced cancers

Langley & Mort 2012 J of Agromedicine
Pesticides May Not be Used in Maine Schools Except by Licensed Applicator

License required for:
- Insecticides, Herbicides, Rodenticides, Fungicides
- Weed&Feed Lawn Care Products
- Mouse poison
- Ant bait (including ‘cups’ and ‘traps’)
- Organic and natural pesticides

Exemptions:
- Emergency use of wasp spray directed into a wasp nest.
- Disinfectants used for routine cleaning.
- Repellents for personal protection
Yes, Your School DOES Use Pesticides

- Bleach and Disinfectants
- Wasp Spray
- Repellents
- Weed-killers
- Organic and Natural Bug Sprays
- Mouse Poison
- Ant Cups

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![Bleach bottle](bleach.jpg)
![Ant cups](ant-cups.jpg)
Maine Requires all K-12 Schools to Use Integrated Pest Management (IPM)

- IPM Universally Recognized as Best Management Practice
- Must Adopt IPM Policy
- Appoint IPM Coordinator
- Notify Parents and Staff of IPM Policy and Before Pesticide Use
- Keep Pest Monitoring and Management Records
Everyone Plays an Active Role in IPM (not just the pest control contractor)

Health & Wellness Coordinator

School Nurse

Business Manager: contracts, budgeting

Contracted pest professional

Custodians: Sanitation, monitoring, pest reporting

Students & Teachers: education, sanitation, monitoring

Maintenance Staff: pest exclusion & monitoring

Sports Staff: scheduling, turf protection

Office Staff: communication, records, scheduling

Kitchen Staff: pest prevention & monitoring
IPM Relies on:

• Education
• Monitoring for Pests and Pest-Friendly Conditions
• Communication
• Leadership
• Pest prevention (sanitation, seal entryways, landscaping)
• Biological, physical, cultural pest control methods
• Carefully selected pesticides used as last resort
Engaging School Nurses as Change Agents to Promote IPM Adoption in Northeast Schools
(http://www.northeastipm.org/working-groups/schools/)

Objectives

■ Develop strategic communication plan
■ Provide training for school nurses throughout the NE region
■ Develop and distribute outreach materials to school nurses

Anticipated Outcomes

■ School nurses will learn how to access information needed to recognize health-impacting pests and pest-friendly conditions
■ School nurses will be empowered to promote and support adoption of effective IPM policies and strategies in their schools
Results of NE School Nurse Survey

827 participants from 10 states
Find full report at: maine.gov/schoolipm
Q3: How do you view pest risk concerns in your school(s)?

On a scale of 1 (low concern) to 3 (high concern) ticks and mosquitoes top the list, followed by lice, stinging insects, poisonous plants and mold. Rodents (mice and rats), bed bugs and fleas are of moderate concern. Cockroaches which are asthma-allergen producing pests, and bats (a rabies vector) were of relatively low concern.

Northeast School Integrated Pest Management Working Group
Ticks Can Make us Sick!

Can transmit infectious diseases to people and pets

**Tick-Vectored Diseases**
- Lyme disease
- Anaplasmosis
- Babesiosis
- Spotted Fevers
- Powassan

**LYME SYMPTOMS: PHYSICAL**

Bull’s-eye rash (Erythema Migrans) in approx. 40% of cases.

- Arthritis
- Flu-like symptoms
- General malaise
- Muscle pain
- Tendonitis
- Sensitivities
- Headaches
- Bell’s Palsy
- Meningitis
- Seizures
Deer Tick

- Larva
- Nymph
- Adult Male
- Adult Female

- Dark brown ‘shield’

Dog Tick

- Larva
- Nymph
- Adult Male
- Adult Female

- White markings

Images from Tick Encounter.org
Lyme is the Most Prevalent Tick Borne Disease

Human Cases in Maine-2016
1473 Lyme
372 Anaplasmosis
82 Babesiosis
11 Erlichia
1 Powassan
Powassan Virus

- Now found in York, Cumberland, Knox, Lincoln Counties.
- ~2% of deer ticks infected. Woodchuck tick is also a vector.
- Symptoms: range from none to brain and spinal cord swelling. Fever, headache, vomiting, weakness, loss of coordination, seizures.
- ~10% fatal. Half of survivors have permanent neurological damage.
- No vaccines or treatment
Powassan Virus

Deer Tick (aka Black-legged Tick)

Woodchuck Tick

Adult
Nymph

Size of a sesame seed
The diagram illustrates the life cycle of ticks, which are vectors for transmitting the bacteria *B. burgdorferi*. Here is a detailed description of the cycle:

1. **Adults females drop off host to lay eggs.**
2. **Eggs hatch into six-legged larvae.**
3. **Larvae attach to and feed on first host and may acquire *B. burgdorferi.*
4. **Larvae molt into nymphs after leaving first host.**
5. **Nymphs attach to and feed on second host and may acquire *B. burgdorferi.*
6. **Nymphs molt into adults after leaving second host.**
7. **Adults attach to the third host for feeding and mating.**
8. **Infected nymphs feed on humans, transmitting *B. burgdorferi.*
9. **Infected adults feed on dogs, and sometimes humans, transmitting *B. burgdorferi.***

This cycle highlights the role of ticks in the transmission of *B. burgdorferi*, which can lead to Lyme disease.
Deer Tick (aka black-legged tick)

Life Cycle
Dress for Success

• Light colored clothing
• Long-sleeves with tight cuffs
• Pants tucked into socks
• Gaiters or duct tape to keep pants tucked into socks

For prolonged outdoor activity in tick-infested areas:
• Consider permethrin-treated clothing (purchase from sporting goods retailers or ship own clothing to InsectShield.com)
Repellents

- Parent permission required to apply to children
- Apply to exposed skin—wash off when come indoors at end of day.
- Picaridin, IR3535, DEET proven effective.
- Other devices and products not proven to be effective!

http://npic.orst.edu/
Time for a Tick Check!

Check Daily!
Remember ticks like to hide where the sun don't shine!

- Scalp
- In and behind ears
- Behind neck
- Underarms
- Belly button
- Pelvic & groin area
- Waist and back
- Between fingers, legs, and toes
- Behind knees

Check crevices like the crotch and groin. Feel for bumps and look for tiny dark spots.
How to Remove an Attached Tick

http://www.cdc.gov/ticks/

tick removal
Remove ticks immediately. They usually need to attach for 24 hours to transmit Lyme disease. Consult a physician if you remove an engorged deer tick.

Using a tick spoon:
- Place the wide part of the notch on the skin near the tick (hold skin taut if necessary)
- Applying slight pressure downward on the skin, slide the remover forward so the small part of the notch is framing the tick
- Continuous sliding motion of the remover detaches the tick

Using tweezers:
- Grasp the tick close to the skin with tweezers
- Pull gently until the tick lets go

UMaine Extension

tick ID
Know them. Prevent them.

Deer Tick (Black-Legged Tick)
- nymph
- adult male
- adult female

Dog Tick
- adult male
- adult female

1-800-821-5821
www.mainehealth.gov

Maine.gov
Tick-Proof your School Grounds

- Mow and weed-whack to keep grass mown
- Rake leaves
- Trim shrubs and low branches
- Mow around woodpiles, stone walls & sheds
- No bird feeders
- Widen wooded pathways
- Install border of wood chips or crushed stone at wooded edges.
Great! Bike path separates playground from wooded tick habitat.
Room For Improvement Here...

Swings too close to woods

Gap in fence invites kids to enter tick habitat
Identify and Monitor Tick Habitat

- Drag square of corduroy or flannel over ground. Examine for ticks.
- ID tick species, know where and when ticks are active
If Considering Pesticide Treatment...

- Hire a qualified professional applicator
- Treat wooded edges only (perimeter treatment)—do not treat lawns.
- **Timing is critical.** One application in mid-late May. Second application in fall may be helpful.
- Contact Maine Board of Pesticides Control for list of companies or pesticide information (207-287-2731)

Tickencounter.org
Learn More…upcoming webinar

Be a sTICKler for Healthy Schools: Managing Ticks in Your School District

Tuesday, October 24, 2017 | 2:00 – 3:30 p.m. ET

Join listserv to receive announcements, news, free webinars & more: www.epa.gov/managing-pests-schools
Pests are Important Sources of Asthma Allergens

- Mice
- Cockroaches
- Dust mites
Average concentrations of mouse allergens are 4-5x higher in schools than in homes of children with asthma**

Chronic Absenteeism Affects Academic Performance

Chang & Romero, 2008

Keep Schools Rodent-free

- House mouse urine triggers asthma
- Deer mouse feces carries hantavirus (hemorrhagic fever).
Integrated Pest Management (IPM) Reduces Pests and Pest Allergens

- 30% decline in mouse allergen after 3 mo
- 70% reduction in cockroach allergen

Mouse urine is detectable with black light.

What we see and what we don’t see (except with a black light) poses risk of human disease!
Excellent Cleaning is Essential

- Keep equipment well maintained
- Use microfiber dust cloths, dry and wet mop heads.
- All surfaces scrupulously clean
- Inspect regularly
Inspect Thoroughly and Often

• Use flashlight, checklist and clipboard

• Look under, around, over equipment

• Focus where pests find food, water, hiding places

• Look for food, spills, soda cans, garbage, clutter, droppings, unfilled crevices, gaps, moisture
Find, Report and Seal Pest Entryways

Install and maintain door-sweeps to keep mice and insects out
Install and Monitor Mouse Traps in Kitchen, Food Storage, Inside Doorways
Bed Bugs

Female lays ~ 10 eggs/day up to 200-500 total, glued to rough surfaces (e.g. wood, fabric)

Completes life cycle in 5 weeks to 4 months depending on temperature and availability of food
Recognizing Bed Bugs

Adult bed bug

Eggs and exoskeletons on backpack

Bed bug fecal spots
Is it Really a Bed Bug? Get Expert Help!

- Cooperative Extension (free pest identification)
  1-800-287-0279
  www.umaine.edu/ipm or County Extension Office

- ME Dept of Agriculture, Conservation and Forestry (photos and factsheets)
  www.gotpests.org
Bed bug found in/on*

Child’s clothing/belongings

Discreetly remove child from classroom. Qualified individual should examine clothes, belongings, and locker for presence of bed bugs. Attempt to collect specimen for confirmatory identification.

- Notify child’s parents by phone. Bed bug inspection report (provided), and educational materials should be sent home with student. Parents should inspect or have pest management professional inspect the home and return notification letter.
  - Evidence of bed bug infestation
    - Investigate other potential sources of bed bugs.
  - NO evidence of bed bug infestation

Classroom/environment

Consider sending parent notification letter (provided) for all students in affected classrooms.

- Have trained staff or school pest management contractor inspect room(s) for evidence of bed bug infestation.
  - Evidence of bed bug infestation
  - NO evidence of bed bug infestation
    - Maintain vigilance

* assumes specimen is confirmed bed bug

Promote rapid response by parents to treat the infestation at home. Provide educational materials and guidance if assistance is necessary.

If repeated instances occur, follow local policy and enlist the assistance of appropriate agencies.
Students may bring or be provided with clean clothing and a back-pack for use in school.

Items from home should be double-bagged, or in large capacity zip-lock bags or similar air-tight containers.
- Discourage bedding and articles from home
- Students change at school in an area that is cleaned daily
- Washing does **not** kill bed bugs
- Drying in a clothes dryer **does**
- Items can be placed in a freezer for 4 days
- Hard surface cleaning and vacuuming

*Bed bugs, head lice and scabies mites are all killed in a clothes dryer*
Maine’s Landlord Law

Landlord is responsible for providing pest-free housing

- Tenant must inform landlord if bed bugs are suspected.
- Landlord must inspect within 5 days and,
- If unit is infested, the landlord must contact a pest control professional within 10 days, and take reasonable measures to effectively identify and treat the bedbug infestation as determined by a pest control agent.
Classrooms

- Limit upholstered furniture.
- Limit rugs or establish cleaning protocols for them.
- Provide space and sealed containers to separate children’s belongings to prevent pest spread.
Stinging Insects

- Inspect eaves, playgrounds, sheds, etc, 2x/mo May-Oct.
- Destroy wasp nests if location poses risk of stings
- Seal openings on buildings & playgrounds before warm weather or after nest destroyed
- Control food, beverages, trash outdoors that attract wasps and bees.
Underground Yellow Jacket Nests (late summer-fall)

- Spray entrance holes with over-the-counter wasp spray or
- Hire professional or
- Cordon-off until hard frost
Inspect Building Exterior Regularly

Check for:
- Wasp nests
- Unscreened vents
- Gaps around utility penetrations
- Water damage
- Damaged/disconnected gutters and downspouts
- Poor drainage
- Damaged/missing window screens
- Bird roosting
How Good is YOUR School IPM Program?

Maine School IPM Checklists (maine.gov/schoolipm):
- Maine School IPM Compliance Checklist
- School IPM Inspection Checklist
- Job-Specific Checklists (School IPM Toolkit)

EPA Tools for Schools (epa.gov/iaq/schools):
- Walkthrough Checklist, Problem-Solvers, Guidance, More

School IPM Cost/Risk Calculator:
  www.ipmcalculator.com/
Key Elements for Success

- Establish a written IPM Plan
- Collaborate and Communicate with administrators, custodial/maintenance staff, teachers, students, contractors, community.
- Provide Good Training for staff.
- No unauthorized pesticide use.
- Regularly Inspect and Monitor for Pests and Pest Prevention Needs
- Keep Records and Track Complaints
- When Pest Control is Needed: Select least-risk IPM solutions.
- Recognize and Reward staff, classrooms for job well done
What Can YOU Do?

- **Get Involved!** Join your school’s IPM committee or invite IPM Coordinator to join the wellness committee.
- **Review IPM policy and procedures** with IPM Coordinator. Review the pest sighting logs and pest management records.
- **Set goals for improvement** and metrics to measure progress.
- **Provide a communication link** among teachers, administrators, IPM Coordinator, facilities program, nutrition program, etc.
- **Advocate for IPM!** Be the catalyst for improving your school’s IPM program.

40% ME school nurses don’t know if school has an IPM policy.
Maine School IPM Program
ME Department of Agriculture, Conservation and Forestry

- Templates
- Training
- Tools
- Guidelines
- Newsletter
- Consultation
- Pest Identification

schoolipm@maine.gov

207-215-4793