Avoiding Ticks During Outdoor Activities

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Northeast Regional Center for Excellence in Vector Borne Diseases (NEVBD)

- Funded by CDC in December 2016 to address tick- and mosquito-borne disease threats

- Lead Organizations
  - Cornell University, College of Agricultural & Life Sciences
  - New York State Department of Health
  - Columbia University
  - Connecticut Agricultural Experiment Station
  - Rutgers University

- Represents 13 states and the District of Columbia
  - We have partnerships with over 60 individuals across more than 20 organizations in the region

www.neregionalvectorcenter.com
New York Vectors

Ixodes scapularis (Blacklegged ticks or Deer ticks)
- Larva
- Nymph
- Adult Male
- Adult Female

Lyme Disease
Anaplasmosis
Babesiosis
Powassan (POW) Virus Disease

Dermacentor variabilis (American Dog ticks)
- Larva
- Nymph
- Adult Male
- Adult Female

Rocky Mountain Spotted Fever
Tularemia
New York Vectors

**Amblyomma americanum (Lone Star ticks)**

- Larva
- Nymph
- Adult Male
- Adult Female

**Haemaphysalis longicornis**
(Asian Longhorned Tick)

**Ehrlichiosis**
**Meat (Alpha-Gal) Allergy**
**Tularemia**
**Southern Tick-Associated Rash Illness**
**Heartland Virus**

NONE.... (yet...)
Lyme in New York State

**Columbia County**

**Tompkins County**

Lyme Disease Incidence

- **Columbia County**
  - **Lyme Disease Incidence**
  - Graph showing the number of cases per 100,000 people from 1995 to 2015.
  - The graph shows a fluctuating trend with peaks and troughs.
  - A map of New York State with an arrow pointing to the location of Columbia County.

- **Tompkins County**
  - **Lyme Disease Incidence**
  - Graph showing the number of cases per 100,000 people from 1995 to 2015.
  - The graph shows a steady increase from 2010 onwards.
  - A map of New York State with an arrow pointing to the location of Tompkins County.

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This page provides a visual representation of the Lyme disease incidence in two counties in New York State: Columbia County and Tompkins County. The graphs track the number of cases per 100,000 people over a period from 1995 to 2015, highlighting the trends and fluctuations in Lyme disease incidence in these counties.
Who Gets Sick?

Confirmed Lyme disease cases by age and sex—United States, 2001-2017

Source: CDC
When Do People Get Sick?


- Adults can be active year-round!
- Why are there cases in the winter?

Source: CDC
Where are People Getting Sick?

Each dot represents a reported case in the county of residence

Tick Identification

DON'T GET TICKED NY

https://nysipm.cornell.edu/whats-bugging-you/ticks/
Tick Identification

Tick ID can be a challenge....

CDC @CDCgov · May 4
Ticks can be the size of a poppy seed. Can you spot all 5 ticks in this photo?
Learn how to prevent tick bites. bit.ly/2rjox6U
Tick Identification

Tick ID can be a challenge....

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Tick ID Services

Tick Identification Services in the Northeastern US

Connecticut Agricultural Experiment Station
(203) 974-8500
Availability: CT only
Costs: free

UMass Amherst TickReport
(413) 545-1057
info@tickreport.com
Availability: United States
Costs: $50

UMaine Cooperative Extension
(207) 581-3880
tickID@maine.edu
Availability: United States
Costs: free

Cornell University Animal Health Diagnostic Center
(607) 253-3900
ticks@cornell.edu
Availability: United States
Costs: $100

Maryland Center for Zoonotic & Vectorborne Diseases
(410) 767-6500
Availability: MD only
Costs: unknown

TickEncounter Resource Center
https://tickencounter.org
Availability: United States
Costs: free

http://neregionalvectorcenter.com/ticks
How do People Pick Up Ticks?

- Ticks search for hosts by waiving their legs around (questing)
- They tend to wait on top of leaf litter and low-lying vegetation
- Blacklegged ticks generally do not move far horizontally on their own
- This species mostly waits for a host to pass by so it can attach
Where do Ticks Live?

Vegetation provides humid habitat
Temperature fluctuation is reduced

Direct sunlight can dry out ticks
Temperatures fluctuate rapidly
Does this mean you will never be bitten by a tick in a grassy field?

**NO!**

Some other tick species, like the lone star tick, do well in fields.

Animals can also move ticks into unsuitable habitats.
Traditional Life Cycle
- **Egg Masses Laid**
- **Larvae Emerge**
  - **Dormant**
  - **Questing**
    - **1st Blood Meal**
  - **Dormant (Overwintering)**
- **Nymphs Emerge**
  - **Questing**
  - **Dormant**
  - **Questing + Mating**
- **Adults Emerge**
  - **3rd Blood Meal**

**Graph:**
- Red: Adult
- Green: Nymph
- Blue: Larva

**Graph Axes:**
- X-axis: Jan to Dec
- Y-axis: Relative Activity from 0 to 50
Year 1

- Egg Masses Laid
  - Dormant
  - Larvae Emerge
    - Questing
    - 1st Blood Meal
      - Disease Reservoirs

Year 2

- Ticks → Nymphs Emerge
  - Dormant (Overwintering)
  - Questing
  - 2nd Blood Meal
    - People
  - Dormant
  - Adults Emerge
    - Questing + Mating
    - 3rd Blood Meal
      - Reproductive Hosts

Potential Management Targets
Egg Masses Laid → Larvae Emerge → Nymphs Emerge → Adults Emerge

- Dormant → Questing → 1st Blood Meal → Dormant (Overwintering)
- Dormant → Questing → 2nd Blood Meal → Questing + Mating
- Dormant → Questing + Mating → 3rd Blood Meal

Ticks

Potential Management Targets

Disease Reservoirs

People

Reproductive Hosts
Direct Control of Ticks

Pesticide Applications
Direct Control of Ticks

Pesticide Applications
Direct Control of Ticks

Pesticide Applications

After the pesticides degrade, ticks can move in from the surrounding area.
Direct Control of Ticks

Pesticide Applications

- Pesticide Spraying
- Expensive
- Kills Other Bugs
- Often not a Permanent Solution for Ticks
Direct Control of Ticks

Pesticide Applications

Spray heavily infested brushy areas and edge habitat in late May

Most Effective Products
- Cyfluthrin
- Deltamethrin
- Permethrin
- Met52 (fungal)
Direct Control of Ticks

Habitat Management

- Keep Grass Short
- Trim Back Brush
- Remove or Mulch Leaves
Direct Control of Ticks

Habitat Management

Create gravel or mulch barriers between infested areas and your yard
Direct Control of Ticks

Habitat Management

Yard Check List

- Keep lawn manicured
- Remove or mulch leaves
- Remove brush from yard
- Make barrier between yard and tick habitat

These steps will reduce tick habitat in the areas where you and your family spend the most time!
Avoiding Ticks

- Stay on well-maintained trails when hiking

- Avoid brushy areas and ‘edge habitats’

- Treat your pets and check them for ticks when they come inside
- Wear light colored clothing
- Wear tall socks
- Wear long pants (no shorts!)
- Wear long sleeves, particularly if doing yard work
- Tuck pants into socks
- Tuck shirt into pants
Setup Tick Safe a Routine

- Remove outdoor clothing near the entrance of your house or apartment
- Seal clothes in a plastic bag
- If a dryer is available, tumble clothes for 20 minutes at high heat
- Do a thorough tick check using a mirror

- Check your:
  - Hairline
  - Ears
  - Armpits
  - Bellybutton
  - Beltline
  - Groin
  - Back of Knees
Treating clothes with permethrin can significantly reduce the risk of tick bites.

About Permethrin
- Highly toxic to ticks and some fish and other bugs, most notably bees
- No known effects on pregnancy or fetus (category B)
- Concentrations used to treat clothing is 27 times lower than the EPA’s level of concern for toddlers
- These concentrations are harmless to most bird and mammals, but NOT CATS!
Tick Repellents

- Ticks can sense you when you are nearby
- Many natural repellents are on the market, but few have been thoroughly tested
- The most effective repellents are:
  - Deet (20% – 30% spray)
  - IR 3535 (10% lotion or 20% spray)
  - Lemon of Eucalyptus (30% spray)
  - Picaridin (20% lotion)
Tick Removal

- Use fine-tipped tweezers
- Grip the tick by the mouthparts
- Pull directly up to remove the tick
- Ticks feed for 3 – 4 days, but are easy to miss
- Most pathogens take 12 – 24 hours to be transmitted, except Powassan virus which can be transmitted in 15 minutes
- If mouth parts are still embedded, do not try to dig them out (often does more harm than good).
- Do not squeeze the tick’s body
- Do not try to burn, suffocate, or rinse off the tick
Questions?

Please feel free to contact me with additional questions at jb766@cornell.edu!