

BRIGHAM AND WOMEN'S HOSPITAL

Rheumatology, Immunology, and Allergy Division – Funded by CDC

Lyme Disease Prevention Curriculum

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<http://www.BWHPreventLyme.org>

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Lyme disease Prevention and Education Introduction

Lyme disease incidence continues to increase despite the growing knowledge of how to prevent it. The description of Lyme disease in North America in 1976 and subsequent characterization of its mode of transmission, causative organism and treatment is one of the most remarkable advances in medicine in the last 25 years[1-3]. Nevertheless, Lyme disease continues to grow as a public health problem[4]. While Lyme disease affects all age groups, children have one of the highest rates[4]. Prevention remains a challenge in this group.

The incidence of Lyme disease is growing nationwide. In 2015 28,453 cases were reported yielding a national average of 8.9 cases for every 100,000 people. In Massachusetts, the US Centers for Disease Control and Prevention reported about 1300 cases of Lyme disease in 2015, but researchers suspect the number is far greater because the disease is hard to diagnose and some states have changed their reporting guidelines. Children ages 5 to 9 have the highest incidence in terms of age group with those adults 65 – 74 the second largest group. In Massachusetts, areas north of Boston in Essex county is one of the areas of high incidence with 405 cases or 75 cases per 100,000 people in 2013.

Health education programs are directed at increasing children's understanding and knowledge, but what is even more important is to teach children preventive behavior. This curriculum is focused on helping to build children's understand about how we get Lyme disease AND ways that they can prevent getting Lyme disease.

We hope that you find this curriculum straight forward and easy to use. Along with the text are some grade specific activities. There is a PowerPoint presentation that accompanies the text. As you read the text, there will be bracketed notes about which PowerPoint slides relate to that section of text. As effective as any educational program can be, it is through continual repetition and re-enforcement that turns a good health practice into a habit. We recommend that this curriculum be used in the spring preferably before June when the Deer Tick nymphs are found in great numbers in the woods, as well as in the fall near Halloween when adult ticks are active.

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1. Burgdorfer, W., et al., *Lyme disease-a tick-borne spirochetosis?* Science, 1982. **216**(4552): p. 1317-1319.
 2. Steere, A.C., *Lyme disease*. N.Engl.J.Med., 1989. **321**(9): p. 586-596.
 3. Steere, A.C., et al., *Lyme arthritis: an epidemic of oligoarticular arthritis in children and adults in three connecticut communities*. Arthritis Rheum., 1977. **20**(1): p. 7-17.
 4. Orloski, K.A., et al., *Surveillance for Lyme Disease --- United States, 1992 -- 1998*. 2000. p. 1-12.

This curriculum contains information about Lyme disease which the teacher or school nurse can use to discuss Lyme disease and prevention with students. Following each information section are activities based on grade level – K-2 and 3-5.

Goals and learning objectives

Material in this curriculum will help students understand:

- You can get very sick from Lyme disease
- Ticks carry the bacteria that will give you Lyme disease
- There are ways YOU can prevent getting Lyme disease

This curriculum focuses on answering the following questions:

- Why do we need to know about ticks?
- How do ticks give us Lyme disease?
- How can Lyme disease affect you?
- What are ways to prevent getting Lyme disease?

Through material and activities students will learn and practice four steps to prevent getting Lyme disease. The four steps are:

Through material and activities students will learn and practice 4 steps to prevent getting Lyme disease. These steps are:

1. When walking through the woods or in meadows, stay on the path
2. Best to wear light colored clothing with long sleeves and your long pants tucked into your socks.
3. Clean areas in your yard where ticks like to live
4. ALWAYS check yourself for ticks when coming from outside and every night before going to bed, especially in spring and summer.

There is also additional information, a fun and informative interactive book, as well as games on our website:

<http://www.bwhpreventLyme.org>



To view the book “The diary of a tick” just click on the book in the upper right corner.

Curriculum

Before you begin, ask your students what they know about ticks and Lyme disease. This will give you an idea of how much they already understand so you can tailor your choice of topics and activities.

1. Why knowing about a tick is important to you.

A. Ticks can make you sick (PowerPoint 2 and 12)

You can get very sick from ticks. Some insects harm humans because they carry diseases. During the summer we are careful not to get bitten by mosquitoes because they make us itch, as well as carry diseases that are really harmful to people.

Similar to mosquitoes, ticks can carry disease-causing microbes. Not all ticks, but some carry bacteria. When they bite, they feed on our blood. The tick has to be attached for a day to give us the germ. If you do get Lyme disease from a tick you may have more than flu like symptoms, swollen joints, aching neck, headache, trouble blinking your eyes and the bulls eye rash.

Two examples of the bulls eye rash



B. How ticks get on you (PowerPoint 3, 4, and 5)

Ticks live in wooded areas, long grasses, and in leaves. Ticks do not fly or jump, they attach to you when you brush against them. People often brush against ticks when walking in the woods or playing in the leaves. Ticks can also get on your pets when they are playing outside.



C. How ticks give us Lyme disease (PowerPoint 6, 7, 8, 9, 10, and 11)

The deer tick is very small and can carry Lyme disease. As deer ticks develop they go through three life stages, larvae (like a baby), nymph (teenager) and adult. Nymphs and adults can give us Lyme disease. Nymphs are really tiny, about the size of a poppy seed, while adults are a little bigger, the size of a sesame seed.



Ticks are out there all year-round when the temperature is above 32 degrees or above freezing. Nymphs are very active during the spring, so you have to be very careful to do all the prevention steps. The adult ticks are most active in the fall (late October-early December) and during warm periods in the winter and in early spring (April-May).

Activities

Kindergarten through second grade

Topic - Knowing about ticks and Lyme disease

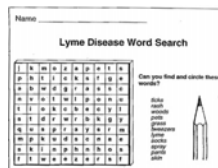
Tick Comparison- Have students contrast and compare the difference between ticks and other insects. Have Students make a chart comparing how ticks differ from other bugs like mosquitoes. For example ticks differ from Mosquitoes because ticks do not fly, but they are similar because both feed on blood.

Lyme disease Video- Watch the Lyme disease video with students. Throughout the video, stop and discuss the information provided. Discuss why the information is important and how it affects the students. (Good for students in Kindergarten and first grades)

Grades three - five

Topic - Knowing about ticks and Lyme disease

Lyme disease Word Search- This can be given out as a homework assignment. After students have completed the word search have students discuss why these words are important.



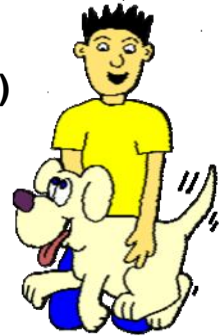
2. Preventing Lyme disease

Student outcome

Students will be able to outline ways to prevent Lyme disease.

A. Preventing Lyme disease (PowerPoint 15, 18, 20, 21, and 22)

- When going out in the woods or tick prone areas dress in light colored, long sleeved shirts, long pants, and socks into pants.
- Use bug spray when going into tick habitat.
- Ticks will also feed on your pets; make sure to check your pets after they have been playing in areas suitable for ticks.



Discussion information

- When walking through the woods or in meadows, stay on the path.
- Best to wear light colored clothing with long sleeves and your long pants tucked into your stocks.
- Clean areas in your yard where ticks like to live.
- **ALWAYS** check yourself for ticks when coming from outside and every day. You can ask a parent for help.
- Check your pets for ticks after they have been in places where ticks might live.
- With a Parents help, remove ticks using a fine point pair of tweezers, grab as close to the head as possible, and pull straight out. The goal is to remove the tick without agitating it. After removal, tape the tick to a tick dock card (see page 11 for an example).

Question to reinforce how to prevent Lyme disease

- **Where is it safest to walk when walking through the woods or in meadows?**
Ans: stay on the path
- **What should you wear when you are going into areas that might have ticks?**
Ans: Best to wear light colored clothing with long sleeves and your long pants tucked into your stocks.
- **What can you do to make your yard less inviting for ticks?**
Ans: Clean areas in your yard where ticks like to live, e.g., mow the grass, remove wood and stone piles, put mulch on the edge of your yard, and remove hedges that hang over into the woods.
- **What is the most important thing to do when you come in from playing outside?**

Ans: ALWAYS check yourself for ticks when coming from outside and every day.

- **Do dogs and cats and other animals that go outside get ticks?**
Ans: Yes. Check your pets for ticks after they have been in places where ticks might live.

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B. Check for ticks daily (PowerPoint 13, 14, 19)

Use the activities below to help students understand the importance of checking themselves for ticks to prevent Lyme disease.

Student Outcomes

- Students will understand the importance of checking themselves for ticks daily.
- Students will be able to identify places on the body where ticks will most likely be found.
- Students will be able to describe tick removal.
- Our motto is “feel for the tick,” “find the tick,” and “free the tick” from our bodies.



How to remove a tick

If you find a tick on you, go find an adult. If the tick is not attached to you, have the adult take a piece of scotch tape and press it to you where the tick is. That way, the tick will not escape or drop to the floor.

If the tick is attached, have an adult remove the tick using a fine-point pair of tweezers, grab as close to the head as possible, and pull straight out. The goal is to remove the tick. After removal, tape the tick to a tick dock card.

Emphasize with students that when they find a tick on themselves it is best to find an adult to help them remove it.



Activities

Second grade through fifth grade

Topic - Things you can do to prevent Lyme disease

Activity 1 – What to wear when walking in the woods

Materials

- **Check off sheet of what to wear in the woods.**

Proper prevention – Students pair up and talk about what to wear in the woods and then check what each other is wearing to see how closely it matches the guidelines. (1.long shirt sleeves; 2.Long pants; 3.light colored shirt; 4.Light colored pants; 5. high socks; 6.pant legs tucked into socks. – students score themselves on how many they know and how many they are actually wearing that day.)

Activity 2. – Learning where to check for ticks on your body.

- **Yellow shower cards outlining places to focus on while doing a tick check.**
- **Star stickers**

The tick check game - Pair students up and have them practice checking for ticks. Have each student place stickers (such as star stickers) on an area where ticks are likely found on the body (neck, back of ears, armpit, belly button, back of knees, and waist as shown on the yellow shower card) and then discuss why ticks are found on those areas. Then remove each sticker on them as if it were a tick.



Shower Card



Activities (cont.)

Second grade through fifth grade

Activity 3 – What a tick feels like on your body

Materials:

- **Mannequin arm with dead ticks or stickers to practice feeling for ticks.**

Practice feeling for ticks- Have students practice feeling for ticks on the mannequin arm. Then discuss how they went about finding the tick on the arm and if they could find a tick on themselves.

Activity 4 – Discussion about tick removal

Materials:

- **Tick dock cards.**

Discussion about tick removal- Ask students what tick removal methods they have used in the past. Many may suggest burning the tick or smothering it. Then discuss the correct way to remove ticks. The best way to remove a tick is to use fine point tweezers, grab as close to the head as possible and pull straight out. Then tape the tick to the tick dock card.



| Tick Dock Card | |
|--------------------------|--|
| Name _____ | Date tick removed <u>3/15/2008</u> |
| Body Location <u>EAR</u> | Tick Area <u>WOODS</u> |
| Age Tick Host _____ | OR CIRCLE CLOSEST TICK SIZE BELOW IF YOU LOST THE TICK |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |

Tick Dock Card

C. Make your yard less inhabitable to ticks: (PowerPoint 17)

Students can learn how to make their yard less inviting to ticks.

Student outcome

- Students will identify areas in their yards that are habitable for ticks and identify ways to improve the area.

Activities

These activities can be found on www.bwhpreventlyme.org. Click on the left hand side on [games] under the [kids] section.

Kindergarten – second grade

1. **Tick Search and Color** – Students are given this picture of a family walking in the woods and asked to search the picture for hidden ticks. Students should circle the tick when they find it. Students can also color the picture at home or in class. This activity reinforces what students will have learned about places to find ticks. Rita Mitchell, RN, public health nurse from Barnstable County Department of Health and the Environment developed the Tick Search and Color picture.



Circle the 4 ticks hiding in this picture. You may color the picture after you find the ticks.

Second grade through fifth grade

2. **Draw Your Own Backyard** – This can be given out as a homework assignment. Students can bring this home along with a Parent's Guide to Lyme Disease Prevention brochure. Students are asked to draw their own backyard and circle three or more things that can be changed to make their backyard safer. They should bring the homework assignment back the next day. Students can be asked if they found anything that can be changed in their backyards to reduce the number of ticks.

Activities (cont.)

Second grade through fifth grade

3. **Playing Safe worksheet-** Have students place marks on the worksheet in areas that would be tick free. Then have children discuss area around their home and school that would be tick free. (Good for 2nd grade and younger)
4. **Schoolyard Tick Walk** – Walk around the schoolyard or playground with your students. Ask students to point out places where ticks are and places that are safe to play. A discussion on safe places to play and walk to school can follow the walk. Also, discuss how improvements could be made to the yard (removing leaf litter, mowing the lawn, placing mulch around the perimeter).