# Communicable Diseases in the School Environment

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## Head Lice

## Head Lice Quiz

- Do head lice cause disease?
- Do head lice causes injury?
- Do head lice fly about the room and lite on everything they see?
- Do the nits somehow pass from child to child like live bugs?

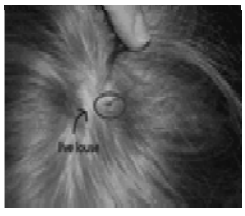
## Causal Agent of Head Lice

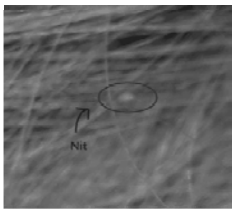
- *Pediculus humanus capitis*, the head louse, is an insect of the order Psocodea and is an ectoparasite whose only host are humans. The louse feeds on blood several times daily and resides close to the scalp to maintain its body temperature.

## Life Cycle of a head louse

- **Eggs:** Nits are head lice eggs. They are hard to see and are often confused for dandruff or hair spray droplets. Nits are laid and cemented at the base of the hair shaft nearest the scalp.
- **Nymphs:** The egg hatches to release a nymph. The nymph looks like an adult head louse, but is about the size of a pinhead.
- **Adults:** The adult louse is about the size of a sesame seed, has 6 legs (each with claws), and is tan to grayish-white. Females are usually larger than males and can lay up to 8 nits per day.
- Head lice live about 20-30 and cannot survive without a blood meal every 2 days.

## What do they look like?

## Who gets head lice?

- In the United States, infestation with head lice (*Pediculus humanus capitis*) is most common among preschool- and elementary school-age children and their household members and caretakers. Head lice are not known to transmit disease; however, secondary bacterial infection of the skin resulting from scratching can occur with any lice infestation.

## How many people in the US get head lice?

- 6 million to 12 million infestations each year among children 3 to 11 years of age.
- Some studies suggest that girls get head lice more often than boys, probably due to more frequent head-to-head contact.
- In the U.S. infestation with head lice is much less common among African-Americans than among persons of other races due to texture of the hair.

## How is head lice spread?

- Getting head lice is not related to cleanliness of the person or their environment.
- Head lice are spread by direct contact with the hair of an infested person.
- The most common way to get head lice is by head-to-head contact with a person who already has head lice.
- Such contact can be common among children during play at school, home, and elsewhere (e.g., sports activities, playgrounds, camp, and slumber parties).

## Uncommon modes of transmission

- Wearing clothing, such as hats, scarves, coats, sports uniforms, or hair ribbons worn by an infested person;
- Using infested combs, brushes or towels;
- Lying on a bed, couch, pillow, carpet, or stuffed animal that has recently been in contact with an infested person.
- Risk of getting infested by a louse that has fallen onto a carpet or furniture is very small

## Treatment

- Requires using either a prescription or an over-the-counter (OTC) medication.
  - Nix (permethrin)
  - Rid (pyrethrin)
- Home remedies include olive oil, petroleum jelly or mayonnaise to suffocate the louse
- Herbal remedies include tea tree oil and peppermint

## Treatment Taboos

- Do not use kerosene to treat head lice.
- Follow directions carefully. Treatment solutions are pesticides.
- Do not use fumigant sprays or fogs; they are not necessary to control head lice and can be toxic if inhaled or absorbed through the skin.
- Only treat confirmed cases of head lice. Do not treat to prevent.

## Prevention & Control of Head Lice

- Avoid head-to-head (hair-to-hair) contact during play and other activities at home, school, and elsewhere (sports activities, playground, slumber parties, camp).
- Do not share clothing such as hats, scarves, coats, sports uniforms, hair ribbons, or barrettes
- Do not lie on beds, couches, pillows, carpets, or stuffed animals that have recently been in contact with an infested person

## Prevention & Control

- Do not share combs, brushes, or towels. Disinfest combs and brushes used by an infested person by soaking them in hot water (at least 130°F) for 5-10 minutes
- Machine wash and dry clothing, bed linens, and other items that an infested person wore or used during the 2 days before treatment using the hot water (130°F) laundry cycle and the high heat drying cycle. Clothing and items that are not washable can be dry-cleaned OR sealed in a plastic bag and stored for 2 weeks.

## Prevention & Control

- Vacuum the floor and furniture, particularly where the infested person sat or lay. However, spending much time and money on housecleaning activities is not necessary to avoid reinfestation by lice or nits that may have fallen off the head or crawled onto furniture or clothing.

## What's should a school do?

- Current evidence does not support the efficacy and cost-effectiveness of classroom or school-wide screening for decreasing the incidence of head lice among school children. School administrators are encouraged to help educate parents and staff about the diagnosis, treatment, and prevention of head lice.

## Educate Parents

- Examine child's head, especially behind the ears and at the nape of the neck, for nits and lice if child exhibits symptoms (primarily itching).
- If nits or lice are found, exam all household members for nits and lice every 2-3 days.
- Persons with live (crawling) lice or nits within 1/4 inch or less of the scalp should be treated.

## School policy on nits

- "No-nits" policies that require a child to be free of nits before they can return to school are not recommended.
- Children should be permitted to return to school or child care after appropriate treatment is started.
- Head lice can be a nuisance but they have not been shown to spread disease.

## Elimination of Head Lice

- To successfully eliminate head lice it is very important that all treatment instructions and steps are carefully followed and completed.
- Re-infestation is common. Do not get discouraged.

## Ringworm

- Ringworm gets its name from the characteristic ring that can appear, but it has nothing to do with an actual worm under your skin.

## What causes Ringworm?

- Ringworm of the body is a fungal infection that develops on the top layer of your skin. It's characterized by an itchy, red circular rash with healthy-looking skin in the middle.

## Ringworm is contagious and can be spread in the following ways:

- **Human to human.** Ringworm often spreads by direct, skin-to-skin contact with an infected person.
- **Animal to human.** Individuals can contract ringworm by touching an animal infected with ringworm. Ringworm can spread while petting or grooming dogs or cats infected with ringworm

- **Object to human.** Ringworm can spread by contact with objects or surfaces that an infected person or animal has recently touched or rubbed against, such as clothing, towels, bedding and linens, combs, and brushes.

## Risk factors

- Damp, humid or crowded conditions
- Close contact with an infected person or animal
- Share clothing, bedding or towels with someone who has a fungal infection
- Sweat excessively
- Participate in contact sports, such as wrestling, football or rugby
- Wear tight or restricted clothing
- Have a weakened immune system


## Treatment of Ringworm

- For a mild case apply an over-the-counter antifungal lotion, cream or ointment : Clotrimazole (Lotrimin AF), Miconazole (Micatin, Micaderm), Terbinafine (Lamisil AT), Tolnaftate (Tinactin) ,
- Wash and dry the affected area. Then, apply a thin layer of the topical agent once or twice a day for at least two weeks, or according to package directions. Extend the application about an inch beyond the visible edge

## Prevention of Ringworm

- Ringworm is difficult to prevent. The fungus that causes ringworm is common and contagious even before symptoms appear.
- Educate yourself and others.
- Keep clean.
- Stay cool and dry.
- Avoid infected animals
- Don't share personal items

# Methicillin-Resistant Staphylococcus Aureus (MRSA)

## What is MRSA?

- *Staphylococcus aureus*, often called "staph" is a type of bacteria commonly found on the skin or in the nose of healthy people. Approximately 30% of people have staph in their noses and do not have any symptoms.
- MRSA which stands for **M**ethicillin-**R**esistant ***S****taphylococcus* ***a****ureus* is staph that is resistant to commonly used antibiotics such as penicillins and currently available cephalosporins.

## Community-Associated MRSA

- In the past, MRSA was found only in healthcare facilities and caused infection in people who were sick. More recently, MRSA has emerged in the community and can cause infections in otherwise healthy people.
- MRSA is a potentially dangerous type of staph bacteria that is resistant to certain antibiotics and may cause skin and other infections.

## How do you get MRSA?

- You can get MRSA through direct contact with an infected person or by sharing personal items, such as towels or razors that have touched infected skin.
- In the community, most MRSA infections are minor skin infections that may appear as sores or boils that often are red, swollen, painful, or have pus or other drainage.

## Signs & Symptoms of MRSA

Most staph skin infections appear as a bump or infected area on the skin that may be:

- Red
- Swollen
- Painful
- Warm to touch
- Full of pus or other drainage
- Accompanied by a fever



## Types of MRSA Infections

- Infections commonly occur either at sites of breaks in the skin such as cuts and abrasions, and areas of the body covered by hair (for example, the back of the neck, groin, buttock, armpit, or beard area of men).
- Almost all MRSA skin infections can effectively be treated in the outpatient setting by drainage of the pus by a healthcare provider with or without antibiotics.
- More serious infections such as pneumonia, blood or bone infections are rare in healthy people who get MRSA skin infections.

## Severe MRSA Infections


## How is MRSA spread?

- Like other causes of skin infections in athletes, MRSA is usually spread from person to person through direct skin contact or contact with shared items or surfaces (e.g., towels, used bandages, weight-training equipment surfaces) that have touched a person's infection.

## Personal Hygiene

- Keep your hands clean by washing frequently with soap and water or using an alcohol-based hand rub.
- Hands should be cleaned
  - After using the toilet
  - Before eating
  - Before and after playing sports
  - Before & after using shared weight-training equipment,
  - When caring for wounds including changing bandages

## Personal Hygiene

- Both plain and antimicrobial soap are effective for hand washing, but liquid soap is preferred over bar soap in these settings to limit sharing.
- If hands are not visibly dirty and sinks are not available for hand washing, alcohol-based hand rubs and sanitizers can be used. Alcohol-based hand rubs with at least 60% alcohol content are preferred.

## Personal Hygiene

- Shower immediately after exercise.
- Do not share bar soap and towels.
- Do not share razors.
- Place a towel on the bench/table
- Wash your uniform and clothing after each use. Follow the clothing label's instructions for washing and drying. Drying clothes completely in a dryer is preferred.

## Which athletes are most at-risk for MRSA skin infections?

- Skin infections including MRSA have been reported mostly in high-physical-contact sports such as wrestling, football, and rugby. However, MRSA infections have been reported among athletes in other sports such as soccer, basketball, field hockey, volleyball, rowing, martial arts, fencing, and baseball.
- Even though little physical contact occurs in some sports during participation, skin contact or activities that may lead to spread of MRSA skin infections may take place before or after participation such as in the locker room.

## Advice for schools, athletic directors, and coaches

- Keep locker rooms clean
- Focus cleaning on commonly touched surfaces and surfaces that come into direct contact with people's bare skin each day. (benches, mats, tables, whirlpools)
- Repair or dispose of equipment and furniture with damaged surfaces that do not allow surfaces to be adequately cleaned.

## School Prevention Strategies

- Make sure supplies are available to comply with prevention measures (e.g., soap & water)
- Enforce policies and encourage practices designed to prevent disease spread. Make sure athletes:
  - keep wounds covered and contained
  - shower immediately after participation
  - shower before using whirlpools
  - wash and dry uniforms after each use
  - report possible infections to coach, athletic trainer, school nurse, other healthcare providers, or parents.

## Should Athletes with MRSA be Excluded?

- If sport-specific rules do not exist, in general, athletes should be excluded if wounds cannot be properly covered during participation.
- “Properly Covered" means that the skin infection is covered by a securely attached bandage or dressing that will contain all drainage and will remain intact throughout the activity.

## Should Athletes with MRSA be excluded?

- If wounds can be properly covered, good hygiene measures should be stressed ie washing hands before and after changing bandages and throwing used bandages in the trash.
- Athletes with active infections or open wounds should not use whirlpools or therapy pools not cleaned between athletes and other common-use water facilities like swimming pools until infections and wounds are healed

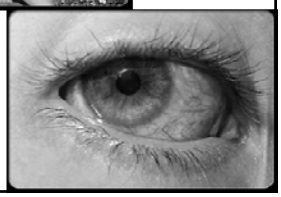
## Pink Eye – Conjunctivitis

## Pink Eye – Conjunctivitis

- Pink eye (conjunctivitis) is redness and inflammation of the membranes covering the whites of the eyes and the membranes on the inner part of the eyelids. These membranes react to a wide range of bacteria, viruses, allergy-provoking agents, irritants, toxic agents, and underlying diseases within the body.

## Causes of Pink Eye

- Allergic
- Viral
- Bacterial
- Mechanical
- Chemical



## Viral Conjunctivitis

- Viral pink eye symptoms are usually associated with more of a watery discharge that is not green or yellow in color. Often, viral "cold-like" symptoms, such as sinus congestion and runny nose, are also present. The eyelids may also be swollen
- Viral pink eye is highly contagious and usually resolves seven to 10 days after symptoms appear.

## Bacterial pink eye

- Symptoms include eye pain, swelling, redness, and a moderate to large amount of discharge, usually yellow or greenish in color. The discharge commonly accumulates after sleeping. May awaken with "eyes stuck shut," requiring a warm washcloth applied to the eyes to remove the discharge.

## Chemical Causes

Common irritants causing chemical pinkeye are household cleaners, sprays of any kind, smoke, smog, and industrial pollutants. Prompt, thorough washing of the eyes with very large amounts of water is very important if an irritating substance enters the eye.

## Prevention of Pink Eye

Infectious forms of pinkeye are highly contagious and are spread by direct contact with infected people.

- Avoid touching the eye area
- Wash your hands frequently
- Never share towels or handkerchiefs
- Throw away tissues after each use
- Disinfect surfaces like countertops, sinks, and doorknobs.

## Influenza

## Impact of Seasonal Influenza

- An annual influenza season in the U.S.
  - Approximately 36,000 deaths,
  - 114,000 hospitalizations, and between
  - $1 billion - $3 Billion in direct cost for medical care.
- Certain modern trends might be increasing the potential for pandemics to cause more illnesses and deaths
  - Urbanization
  - International travel
  - Increasing number of elderly

## Seasonal vs Pandemic Influenza

- Seasonal- caused by modified versions of Influenza that are already in circulation
- Pandemic- (rare only 3 in the last century) caused by novel virus strains. It occurs only when a new (or novel) influenza A virus emerges and spreads globally. By definition, most people have never been exposed to these viruses and therefore are susceptible to infection by them

20-40 million deaths >2.5%

H1N1

2 million deaths <0.2%

H2N2

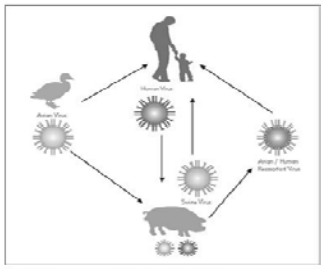
1 million deaths <0.1%

H3N2

4000+ deaths <0.2%

H1N1

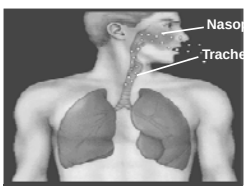
## Why Influenza Pandemics occur



- Novel virus occasionally emerge among humans as part of natural ecology and biology.
  - Jumping of species from animals to humans– examples include swine and avian influenza virus
  - Mixing or reassortment of genes from animal and human influenza leads to development of a new hybrid influenza virus. This occurs when a single animal or a person is co-infected by both human and animal influenza virus

## Influenza Pathogenesis

- Highly contagious
- Respiratory transmission of virus
- Replication in respiratory epithelium with subsequent destruction of cells
- Viral shedding in respiratory secretions for 5-10 days



## Complications

- Pneumonia
- Otitis Media
- Sinusitis
- Tracheobronchitis
- Asthma
- Reye's Syndrome
- Pericarditis & Myocarditis
- Encephalitis and seizures
- Death 0.5-1 per 1,000 cases

## How is Flu Spread?


Typically it spreads from person to person when an infected person coughs or sneezes. People also become infected when the virus gets on their hands and they rub their eyes or nose.

## CDC Influenza Vaccine Recommendations

**"The single best way to protect against the flu is to get vaccinated each fall."**

February 2010 -CDC's Advisory Committee voted for "universal" flu vaccination in the U.S. to expand protection against the flu to more people beginning 2010-2011 season

- All persons 6 months of age and older
- 6 mo to 8 yrs may need two doses

## Types of Influenza Vaccine

The "Flu Shot": inactivated vaccine
- duration of immunity 1 year or less
- Age 6 months and older if no contraindications

(Individuals allergic to eggs or those with previous reaction should not take vaccine)

The Nasal Spray Flu Vaccine: Live Attenuated Influenza Vaccine (LAIV)
- duration of immunity at least 1 year
- Ages 2 yrs to 49 yrs, if no contra-indications (pregnancy, immuno-compromised, certain chronic diseases

## Can Flu vaccine cause the flu? Answer: No

•Seasonal Influenza vaccine protects against three influenza viruses that research indicates will be most common during the upcoming season.

•The viruses in the vaccine change each year

•About 2 weeks after vaccination, antibodies that provide protection against influenza virus infection develop in the body.

## Pharmaceutical Interventions: Immunizations

- Vaccine to protect against the nH1N1 virus is now part of the annual vaccine
- Chain pharmacies may administer vaccine
- Medicare covers flu vaccine for seniors
- Most insurers now cover flu vaccine

## When to get vaccinated

• Yearly flu vaccination should begin in September or as soon as vaccine is available and continue throughout the influenza season, into December, January, and beyond.
• Influenza outbreaks vary -can happen as early as October, however most of the time influenza activity peaks in February or later

## High Risk Groups

- All persons 50 years of age or older
- Residents of long-term care facilities
- Pregnant women
- Persons 6 months of age and older with chronic illness such as asthma or diabetes
- People caring for infants and young children
- Health care providers

## Pharmaceutical Interventions: Anti-virals


**Tamiflu and Relenza work best when administered within 48 hours of onset of symptoms**

**Priority use for Tamiflu and Relenza:**

People who are very sick (hospitalized)
People who are sick with flu symptoms and who are at increased risk of complications:
- pregnant women,
- young children,
- people 65 and older, and
- people with chronic diseases (e.g., asthma, COPD, and diabetes)

**Antiviral medications can sometimes be used for preventive treatment in limited situations**

## Non-pharmaceutical Interventions

- Hand hygiene
- Cough etiquette
- Use hand sanitizer
- Stay home when you are ill
- Keep children home when they are ill
- Disinfect surfaces
- Tele-commute
- Use facemask when appropriate
- 6 feet from others
- Isolate ill
- Cancel public events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## Non-pharmaceutical Interventions: Cough Etiquette

## Non-pharmaceutical Interventions: Hand Hygiene

## Survival of Influenza Virus on *Surfaces*

- Hard non-porous surfaces 24-48 hours
  - Plastic, stainless steel
    - Recoverable for > 24 hours
    - Transferable to hands up to 24 hours
- Cloth, paper & tissue
  - Recoverable for 8-12 hours
  - Transferable to hands 15 minutes
- Viable on hands <5 minutes only at high viral titers
  - Potential for indirect contact transmission

Source: Bean B, et al. JID 1982;146:47-51

## What about School Closure?

- CDC guidance does not recommend closure as means of containment
- Closures due to lack of staff or significant student absences per district policy
- Breakfast and lunch program policies developed by TX Dept. of Agriculture
- Influenza-like Illness (ILI) surveillance
- Decrease number of social contacts
- Alter school schedules
- Postpone athletic and other school events
- Continuity of operations plan

## Questions?

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