MORE COMMON ILLNESSES AMONG CHILDREN IN CHILDCARE FACILITIES

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pennsylvania DEPARTMENT OF PUBLIC WELFARE

pennsylvania DEPARTMENT OF HEALTH

Pennsylvania Early Learning Keys to Quality

GET SMART Know When Antibiotics Work www.cdc.gov/getsmart

University Hospitals

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Perelman School of Medicine University of Pennsylvania

More Common Childhood Infections

- Webinar I review
  - Themes
  - Organisms and antibiotics
  - Fever







More Common Childhood Infections

- Additional infections
  - Bacterial diarrhea
  - Pertussis
  - Influenza
  - Parvovirus
  - Hepatitis
  - Urinary tract infection
  - Herpangina
  - Roseola







Themes

- Symptoms
- Causes
  - Organism
- Transmission
  - Infectiousness
  - Modes of spread
  - Prevention
- Treatments
- Exclusion/return







Themes

- Symptoms
- Causes
  - Organism
- Transmission
  - Infectiousness
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  - Prevention
- Treatments
- Exclusion/return










Symptoms

- What are the child's symptoms?
- What is the risk for serious illness?

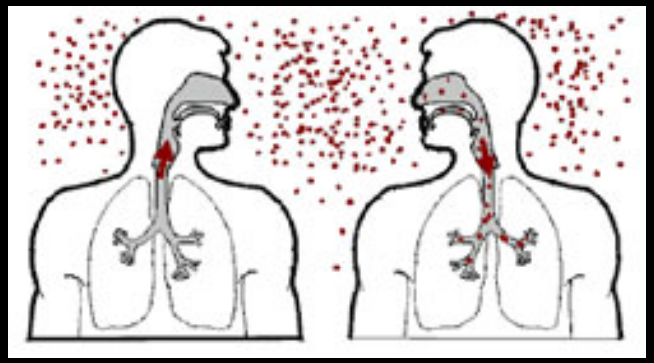
Causes/Organism/s

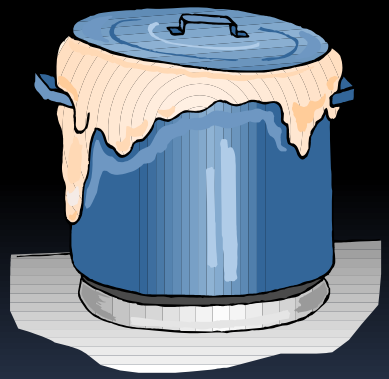
- What organisms usually cause this illness?

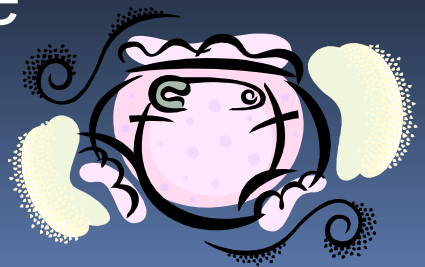


Transmission

- Infectiousness
  - Does it spread easily?
  - Timing
- Modes of transmission
  1. Contact
  2. Droplet
  3. Airborne
  4. Bloodborne

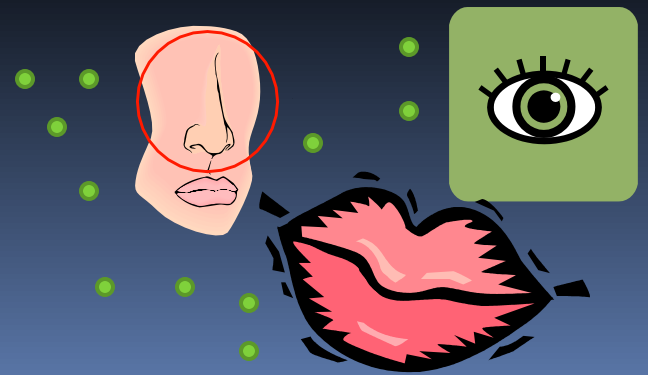






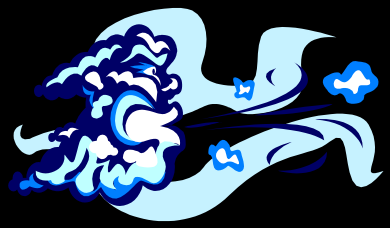
Modes of transmission

1. Contact
   - Hands!, toys, doorknobs
   - Colds, Rotavirus, hepatitis A, Salmonella, Tinea
2. Droplet
   - Cough, sneeze => eyes, nose, mouth
   - Influenza, RSV, pertussis, strep throat



Modes of transmission

3. Airborne
   - Chicken pox, measles, tuberculosis



4. Bloodborne
   - HIV, hepatitis B, C

Prevention/Control

- How can the illness be prevented?
  - Immunizations
    - Best protection against preventable illness
    - Especially important in childcare
- How can we keep the illness from spreading?
  - Handwashing/alcohol-based hand sanitizer!!!
  - Diaper/toileting hygiene
  - Cleaning surfaces
  - Universal/Standard precautions
  - Immunizations

Recommended Immunization Schedule 0-6 years, U.S.-2011

Vaccine ▼ Age ▶	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B[1]	HepB	HepB			HepB						
Rotavirus[2]			RV	RV	RV[2]						
Diphtheria, Tetanus, Pertussis[3]			DTaP	DTaP	DTaP	*see footnote*[3]	DTaP				DTaP
Haemophilus influenzae type b[4]			Hib	Hib	Hib[4]	Hib					
Pneumococcal[5]			PCV	PCV	PCV	PCV				PPSV	
Inactivated Poliovirus[6]			IPV	IPV	IPV						IPV
Influenza[7]					Influenza (Yearly)						
Measles, Mumps, Rubella[8]						MMR		see footnote[8]			MMR
Varicella[9]						Varicella		see footnote[9]			Varicella
Hepatitis A[10]						HepA (2 doses)				HepA Series	
Meningococcal[11]										MCV4	

Range of recommended ages for all children

Range of recommended ages for certain high-risk groups

http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm
http://www.cdc.gov/vaccines/default.htm

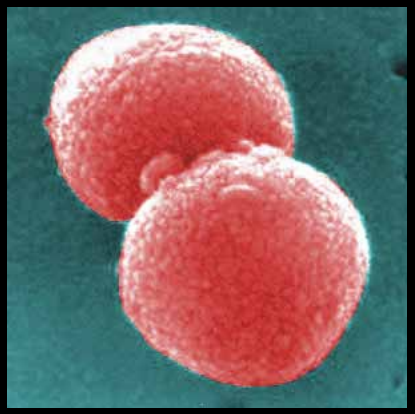
Exclusion/Return

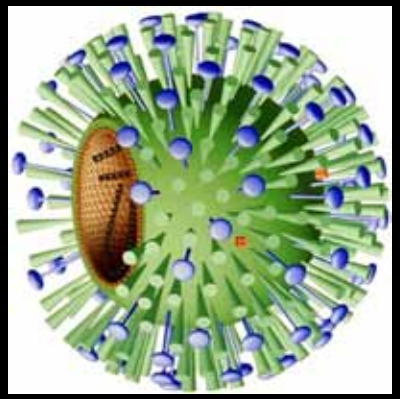
- Contagious
- Unable to participate in activities
- Care for other children would be compromised
- Fever with behavior change
- Looks or acts very ill
- When can the child return?

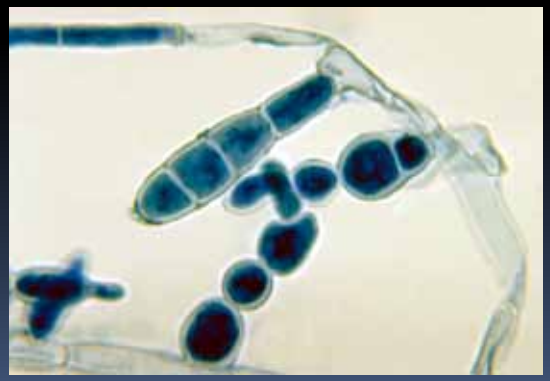
The Pennsylvania Code: Chapter 27. Communicable and Noncommunicable Diseases
Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs
Model Child Care Health Policies, Healthy Child Care Pennsylvania, The Early Childhood Education Linkage System (ECELS)

Types of infectious organisms

- Bacteria:
  - Virus
  - Fungus
  - Parasites







Treatments

- Virus treatments
  - Nonspecific: supportive care, time
  - Antibiotics don't work
  - Specific treatments
    - Anti-retrovirals
    - Interferon
- Bacteria sometimes respond to antibiotics
  - Amoxicillin, Azithromycin
  - Side effects
    - Mild/moderate: rash, diarrhea
    - Severe: allergy/shock
    - Antibiotic resistance**

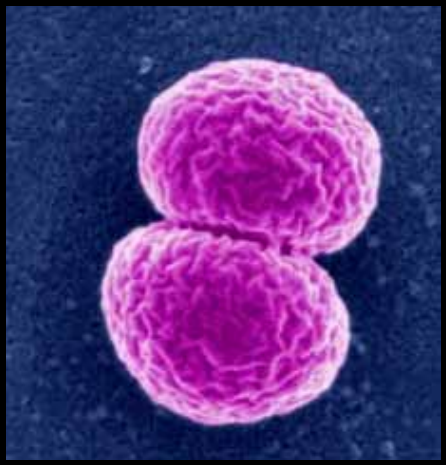
Antibiotic-resistant Bacteria

- Induced by antibiotic exposure:
  - More severe illness
  - Longer illness
  - Limited treatment options
- Resistant bacteria in future:
  - Child
  - Societal
- Lagging antibiotic development
- Judicious use prolongs antibiotic usefulness

Common illnesses

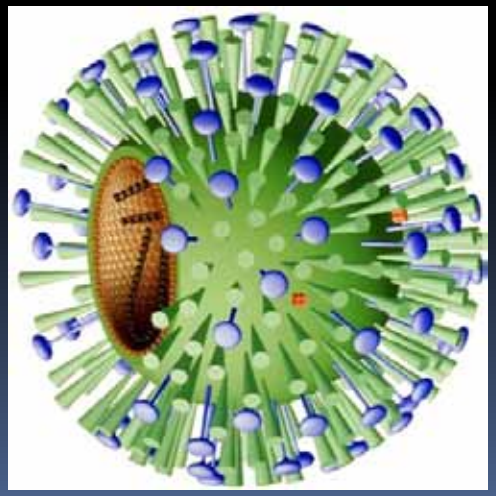
- Bacteria: Antibiotics sometimes helpful
  - Middle ear infections
  - Sinus infections
  - Skin infections
    - Impetigo, cellulitis, abcess , (MRSA)
  - Streptococcal pharyngitis
- Virus: Antibiotics not helpful
  - Usually self-limited
    - Improvement within 7-10 days
  - Colds, coughs, runny nose
  - Bronchiolitis
  - Vomiting, diarrhea
  - Simple conjunctivitis

More illnesses



Bacteria

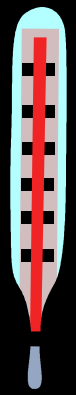
- Bacterial diarrhea
  - Salmonella
  - Shigella
- Pertussis
- Urinary Tract Infection



Virus

- Influenza
- Parvovirus b19
- Hepatitis
  - A
  - B
  - C
- Herpes
- Enterovirus

Fever

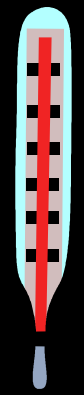


- Definition
  - 100° F (37.8 ° C) axillary
  - 101 ° F (38.3 ° C) oral, ear
  - 102 ° F (38.9 ° C) rectal
- Prompt medical evaluation <4-6 mo (<2 mo. urgent)
  - 100° F (37.8 ° C) axillary
  - 101 ° F (38.3 ° C) rectal

Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs, 3rd Edition *(CFOC3);* National Resource Center for Health and Safety in Child Care and Early Education. http://nrckids.org/providers.htm

Fever

- Usually self-limited virus
  - Immunized child without local symptoms
- Not harmful by itself
  - Some children prone to febrile seizures, kidney/bladder infections
  - Medical care if persistent or severe symptoms
- Care of underlying illness
- Fluids
- Analgesics (not aspirin)
  - Acetaminophen
  - Ibuprofen >6 months



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  - Urinary tract infection
  - Herpangina
  - Roseola



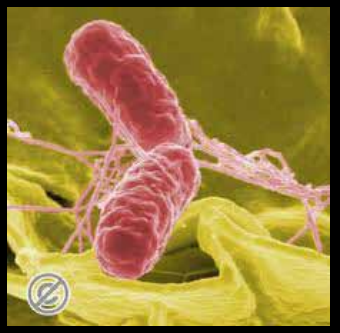




Bacterial diarrhea: Salmonella

- Much rarer than viral gastroenteritis
- Highest attack rate 1-4 years of age
- Reportable, health department involvement
- Fever, blood and/or mucous in stool
- Salmonella Typhi most severe
  - Can be chronic carrier
- Blood, bone infections more rare
- Infected animal product or human
  - Poultry, beef, eggs
  - Pet reptiles
- Hand/mouth/food/fecal contamination
- Fluids, hydration

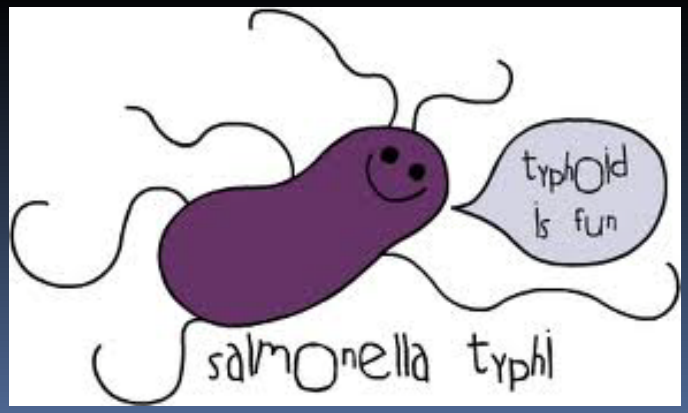
Bacterial diarrhea: Salmonella



- Antibiotic treatment
  - Does not usually shorten illness
  - Can prolong shedding
  - Not indicated unless <3 month or high risk of invasive disease
- Exclude until general exclusions not met
  - Frequency, severity of diarrhea
- Prevention/Control
  - Reportable
  - Meticulous food prep, diapering, handwashing
  - Typhoid vaccine for travel >2 years, sometimes

Bacterial diarrhea: Salmonella

- Salmonella serotype Typhi
  - Antibiotics
  - Culture everyone
  - Return:
    - Young children: 3 negative stool cultures , 24 hours apart
    - >=5 years: no diarrhea >24 hours
  - Special rules for staff and food handlers



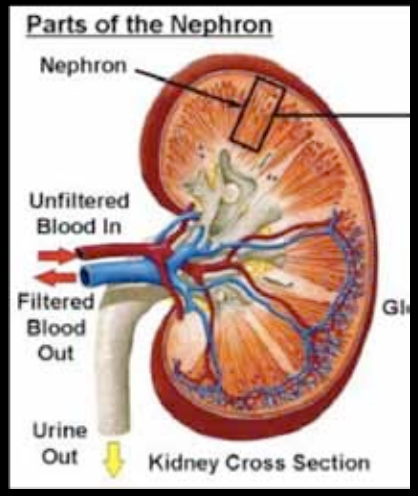
Bacterial diarrhea: Shigella

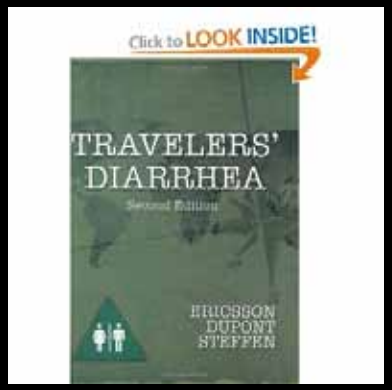
- Fecal contamination (direct, indirect), houseflies
- Contaminated food or water
- +/-Fever, watery or blood and/or mucous in stool
- Treatment:
  - Hydration
  - +/- Antibiotics
  - Shed organism up to one week, usually

Bacterial diarrhea: Shigella

- Control
  - Reportable, health department involvement
  - Meticulous hand hygiene
- Exclude until
  - No diarrhea >24 hours
  - 2 negative stool cultures
    - 24 hours apart
  - Special rules for food handlers
- Prevention
  - Meticulous food prep, diapering, handwashing

Bacterial diarrhea
Toxin-producing E coli





- Milder strains
  - Travelers' Diarrhea
    - Usually self-limited
- More invasive strains
  - Reportable
  - Shigella-like illness
  - Hemolytic-uremic syndrome
  - Similar treatment, control to Shigella
- Hand/mouth/food/fecal contamination
- Prevention
  - Meticulous diapering and hand washing

Audience question #1

A 2 year old child has been out with salmonella diarrhea (not S. Typhi). She's afebrile, her diarrhea has resolved and she''s ready to play. Which 1 of the following is true?

A. She needs 3 negative stool cultures before returning to childcare
B. All childcare staff need to be tested
C. She needs antibiotic treatment before returning
D. She can return to childcare
E. Other
F. Not sure

Audience question #1

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More Common Childhood Infections

- Additional infections
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  - Influenza
  - Parvovirus
  - Hepatitis
  - Urinary tract infection
  - Herpangina
  - Roseola







Pertussis
whoooping cough

- Bacteria
- Catarrhal phase (cold symptoms)
- Severe persistent cough
  - Paroxysms : inspiratory whoop
- Improves over weeks to months
- Infants under 6 months
  - Gagging, gasping, apnea
  - Complications
    - Pneumonia, seizures, death

Pertussis
whoooping cough

- Antibiotics prevent spread
- Exclude until 5 days of antibiotics
- Control
  - Reportable
  - Prophylactic antibiotics to family, children, staff
- Prevention
  - Immunize adults and children

More Common Childhood Infections

- Additional infections
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Influenza

- Virus: Influenza A (includes H1N1), B
- High fever, chills, headache, malaise, cough, congestion
- Can be severe complications
  - Hospitalization, wheezing, pneumonia, encephalitis, myocarditis, death
- Droplet spread (cough, sneeze)
- Infectious before symptoms, highly contagious, especially during fever
- Seasonal epidemics with new strains

Influenza

- Treatment
  - Supportive
  - Antivirals sometimes used >1 year
    - Limited effectiveness, side effects
- Control
  - Stay home during flu season with respiratory illness
    - Until no fever for 24 hours
  - Cough, sneeze into a tissue or your arm
  - Handwashing
- Prevention
  - Immunization: new each year, booster 1st year <age 9
    - >6 months of age
    - Contraindication: severe egg allergy, shock, diffuse hives

Audience question #2

A 1 year old child comes for a check-up in January. He throws up when he eats eggs, he has a history of asthma, and his grandmother got sick when she received the flu vaccine last year. This child should not receive the influenza vaccine

A. True, no influenza vaccine for him
B. False, he should be immunized
C. We need more information on the grandmother's history
D. Not sure

Audience question #2

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Parvovirus b19 Fifth disease

- Virus:
  - Child looks well
  - Slapped cheek rash
  - Lacy reticular rash
  - +/- fever
  - +/- joint pain

Red Book Online Visual Library, 2009. Image 093_08. Image 093_14. Available at: Available at: http://aapredbook.aappublications.org/visual.

Parvovirus b19
Fifth disease

- § Not contagious once rash appears
- § Rash can last months
- § +/- more severe in
  - n Congenital anemias
  - n Pregnancy, early
- § 50-90% adults immune
- § Handwashing

Red Book Online Visual Library, 2009. Image 093_08. Image 093_14. Available at: Available at: http://aapredbook.aappublications.org/visual.

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  - Herpangina







Hepatitis

Hepatitis A virus

- Fever, malaise, nausea, jaundice
- Younger children with milder illness or no symptoms
- Fecal-oral transmission
- Most contagious 1-2 weeks before jaundice
- Treatment: supportive
- Prevention/control
  - Exclude for 1 week after onset of illness
  - Immunization

Hepatitis
Hepatitis B virus

- Spectrum of symptoms:
  - Malaise, nausea
  - jaundice, joint pain, rash
  - Fulminant hepatitis
- Younger children with milder illness or no symptoms
- Chronic infection:
  - Younger children: more risk
    - 90% infected newborns
    - 25-50% infected 1 - 5 yrs
    - 2-6% infected when older; 8% in some countries
  - Cirrhosis, cancer

Hepatitis
Hepatitis B virus

- Transmission:
  - Blood and body fluid
    - Blood exposure
    - Sexual contact
    - Needles
    - Perinatally
    - Prolonged household contact
- Treatment: supportive
- Control
  - Universal/standard precautions
  - Bleach
- Immunization: childcare exposure rare

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Hepatitis
Hepatitis C virus

- Symptoms like mild Hep B
- Chronic infection
  - 50-60% infected children
  - 70-80% infected adults
  - 1.3% of U.S. population
    - Perinatal transmission 5-6%
  - Risk of cirrhosis, cancer
- Treatment
  - Antivirals for chronic infection
    - Difficult
    - Effective in ~50%
- Control
  - Universal/standard precautions

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Audience question #3

Should a 3 year old child with chronic Hepatitis C be excluded from childcare because of risk of contagion to the other children?

A. Yes, exclude
B. No, do not exclude
C. We need more information on the birth history
D. Not sure

Audience question #3

Should a 3 year old child with chronic Hepatitis C be excluded from childcare because of risk of contagion to the other children?

A. Yes, exclude
B. No, do not exclude
C. We need more information on the birth history
D. Not sure

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Urinary tract infection

- Bladder or kidney infection
  - Fever, abdominal pain
  - Pain with urination, urinary frequency, accidents
  - Usually bacterial
- Most frequent occult pediatric bacterial infection
  - Up to 5% of infants with unexplained fever
  - More common in girls and uncircumcised boys
- Diagnosed with catheterized urinanalysis and culture in non-toilet trained children
- Treatment
  - Antibiotics
- Contagious: no
- Standard exclusions apply

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Herpangina

- Herpes simplex virus Type 1
  - Newborn infection can be severe
  - Usually no symptoms in older children
  - Gingivostomatitis
  - Fever, irritability
  - Contagious for ~1 week
  - Persists in latent form: cold sores
  - Contact with secretions
  - Antivirals not usually used for uncomplicated cases

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Herpangina

- Enterovirus
  - Coxsackie virus: Hand Foot Mouth
  - Seasonal epidemics
  - Respiratory and fecal/oral spread
- Treatment: supportive, hydration
- Exclusions
  - Mouth sores with drooling
- Prevention
- Hand hygiene
- No sharing utensils
- Surface disinfection

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Roseola
Human Herpesvirus 6

- Peak between 6-24 mo.
  - Virtually all children have it by age 4
- Contagious before symptoms
- High fever (39.5° C, 103° F)
- Respiratory congestion, red eardrums
- Irritability, febrile seizures, rare encephalitis
- Diffuse pink blanching rash once fever resolves

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The Report of the Committee on Infectious Diseases

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Red Book Online Visual Library, 2009. Image 063_03. Available at: http://aapredbook.aappublications.org/visual.

Roseola
Human Herpesvirus 6

- Supportive treatment
- Feel better once rash appears
- Transmission: secretions
- Standard exclusions

Red Book Online Visual Library, 2009. Image 063_03. Available at: http://aapredbook.aappublications.org/visual.

Summary

- Most childhood infections
  - Mild, self-limiting
  - With supportive care, most children can participate in childcare
    - Exclusion policies for contagion, severe illness, conditions precluding participation
- Bacteria can be antibiotic-responsive
- Viruses don't respond to antibiotics
  - Antibiotics don't reduce symptoms , or shorten illness/contagion
- Judicious antibiotic use
  - Minimize future resistance
- Control
  - Immunizations
  - Handwashing
  - Meticulous hygiene with diaper changing
- Model policies, PA Code, guidelines: resources

General Exclusions

- Contagious
- Unable to participate in activities
- Care for other children compromised
- Fever and behavior change
- Looks or acts very ill

Specific Exclusions

- Rash with fever and behavior change
- Mouth sores with drooling
- Abdominal pain severe, persistent, or with fever
- Vomiting >2ce in previous 24 hours
- Diarrhea not contained in diaper, accidents, >2 above normal for that child
- Blood or mucous in stool, unexplained
  - Salmonella, shigella, toxin-produciing E coli, Hep A
- Active tuberculosis
- Chicken pox until rash dry/crusted
- Until treated:
  - Impetigo, strep throat, pertussis, lice, scabies

Resources

- The Pennsylvania Code: Chapter 27. Communicable and Noncommunicable Diseases http://www.pacode.com/secure/data/028/chapter27/chap27toc.html
- Childcare and Antibiotics. Commonwealth of Pennsylvania, Center for Clinical Epidemiology and Biostatistics at Penn, Centers for Disease Control and Prevention. http://www.med.upenn.edu/antibiotics/
- CDC Get Smart About Antibiotics. http://www.cdc.gov/Features/GetSmart/
- *Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs*, 3rd Edition *(CFOC3);* National Resource Center for Health and Safety in Child Care and Early Education. http://nrckids.org/providers.htm
- Model Child Care Health Policies, Healthy Child Care Pennsylvania, The Early Childhood Education Linkage System (ECELS) http://www.ecels-healthychildcarepa.org/content/MHP4thEd%20Total.pdf

Resources

- Training of childcare centers on childhood illness and use of antibiotics, In: *Managing Infectious Diseases in Childcare and Schools, 2nd ed. Susan S. Aronson, MD, Timothy R. Shope, MD, MPH, ed., 2009, American Academy of Pediatrics.* ISBN 13: 978-1-58110-266-6
- *2011 Child and Adolescent Immunization Schedules, Centers for Disease Control and Prevention, Department of Health and Human Serviices.. http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm; http://www.cdc.gov/vaccines/default.htm*
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Questions and Discussion