

# Infection Prevention and Control in Schools

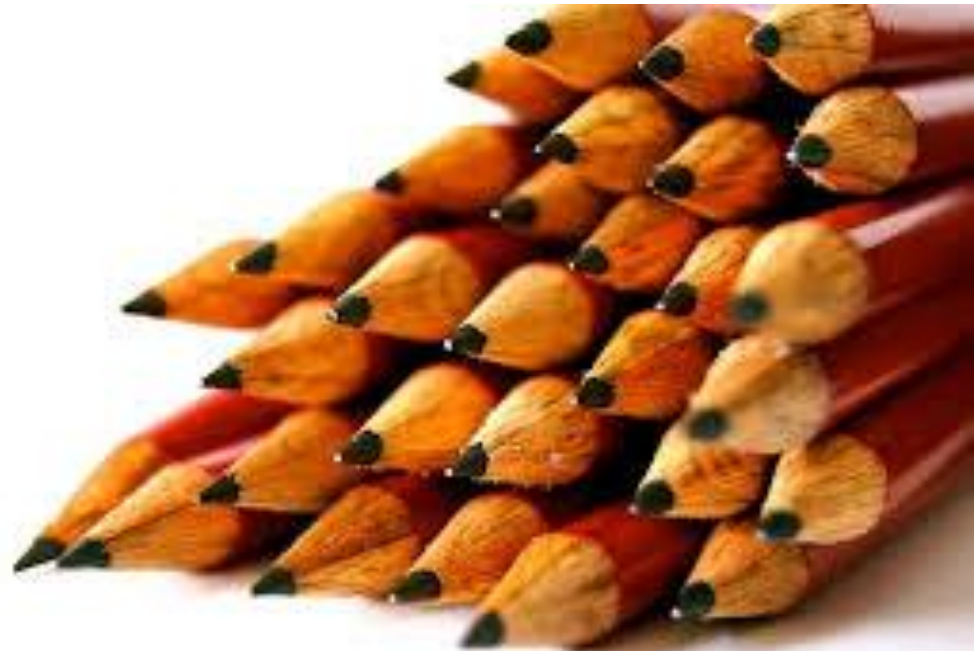


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# Learning Objectives

- ✓ Apply effective infection prevention practices in school settings
  - Maintain **clean** environment safe and conducive to learning
  - Effectively **contain** infective organism spread leading to infection exposure
  - Maximize **cooperation** from students, teachers and other school staff to prevent infection transmission

# Schools can be instrumental in keeping their communities healthy



Resource: CDC, 2011

## Each school year:

- ✓ 40% of children miss at least 3 days due to infection
- ✓ 22 million school days are lost due to common cold
- ✓ 38 million school days are lost due to influenza



Resource: CDC, 2011

How does your school meet the following challenges to prevent infection transmission?



How does your school stay clean?



How does your school help others **cooperate** with infection prevention strategies?



How are infectious secretions **contained**?





How does your school prevent infections when people are in close contact with each other?



How does **shared equipment** increase the risk of infection transmission?

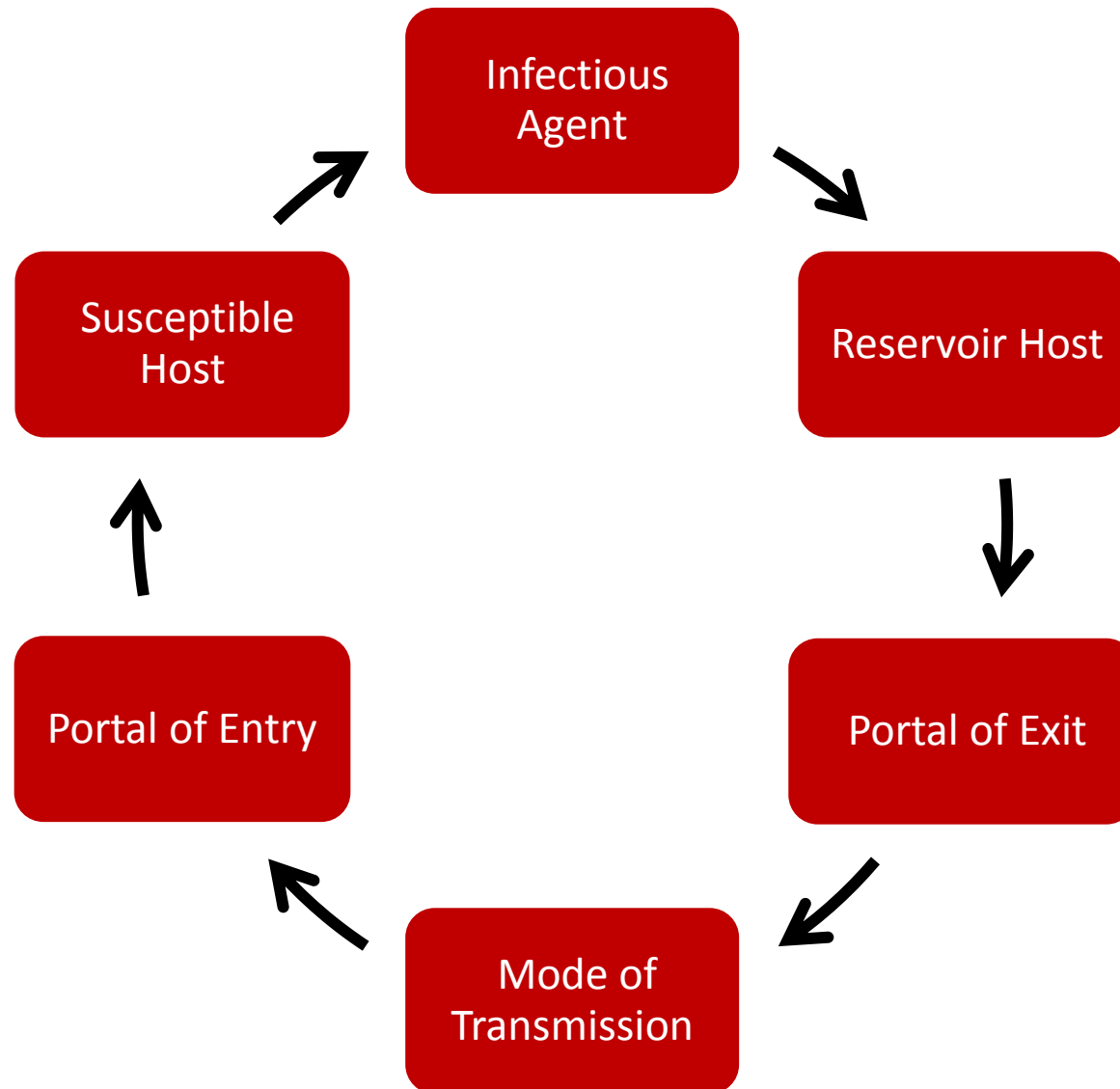


# Quick Review

What is necessary for an infection to occur?



# Chain of Infection



# Who gets infections? (Susceptible Host)



# Host Susceptibility

Dependent upon:

- ✓ **genetic factors**
  - gender
  - DNA
- ✓ **general actors of infection protection**
  - skin and mucous membranes
  - gastric acid
  - cilia in the respiratory tract

# What increases your susceptibility to infection?

- ✓ Depressed immune response
- ✓ Co-morbidities
- ✓ Malnutrition
- ✓ Antibiotic usage
- ✓ Invasive devices
- ✓ Stress

What decreases your susceptibility to infection?



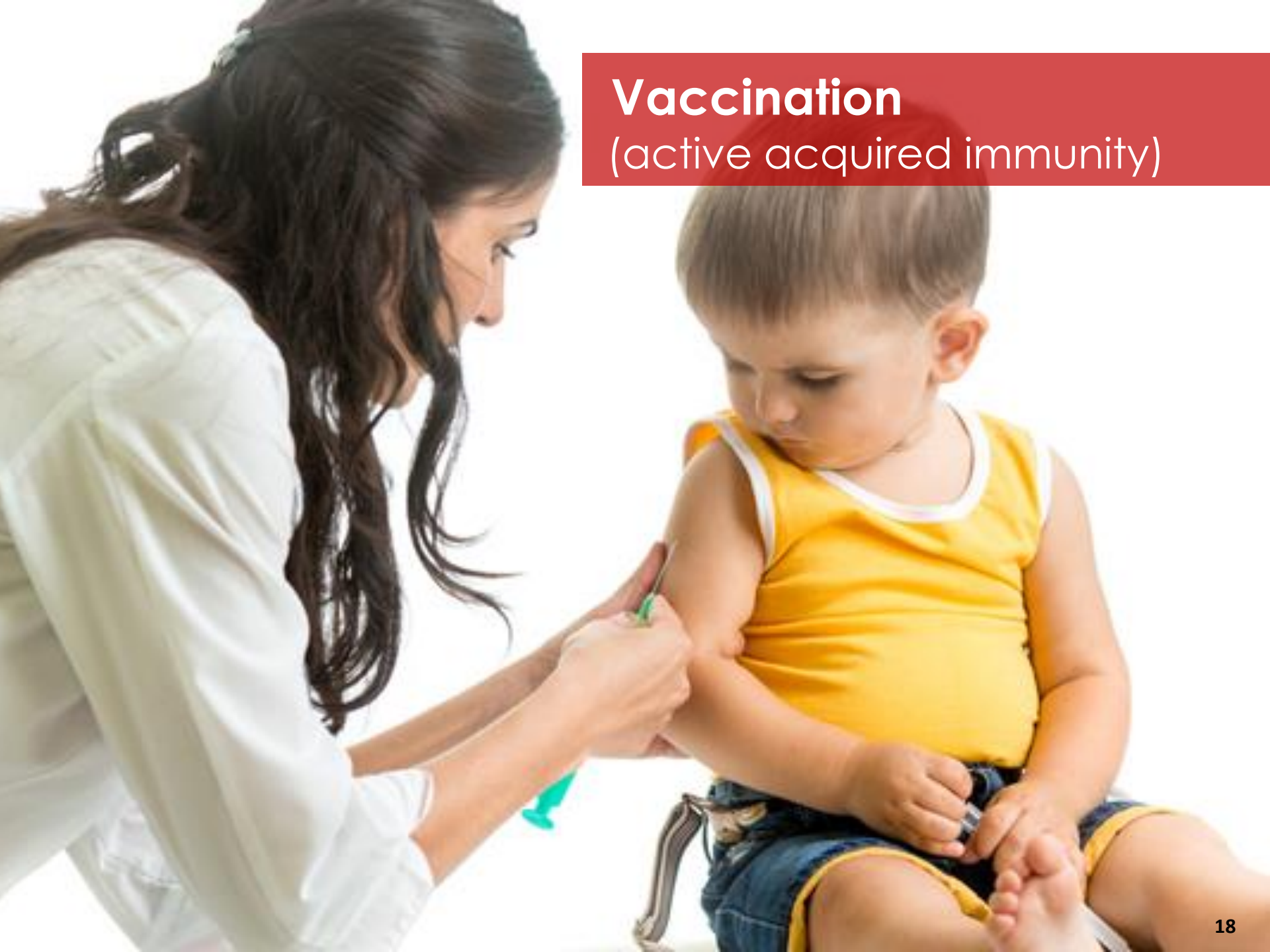


Acquiring protective antibodies through infection (active acquired immunity)



# Vaccination

(active acquired immunity)



# Administration of immune globulin or antitoxin (passive acquired immunity)





Transplacental transfer of maternal antibodies  
(passive acquired immunity)

What about the germs?



A close-up photograph of a human face, focusing on the eyes and nose. The face is surrounded by numerous green, spiky virus particles of various sizes, some appearing to be floating in the air around the face. The background is dark, making the face and the green particles stand out.

Microscopic organisms  
are **everywhere**

Usually, microorganisms included in our “normal flora” protect us from invasion of other microorganisms





Sometimes our own flora can give us an infection



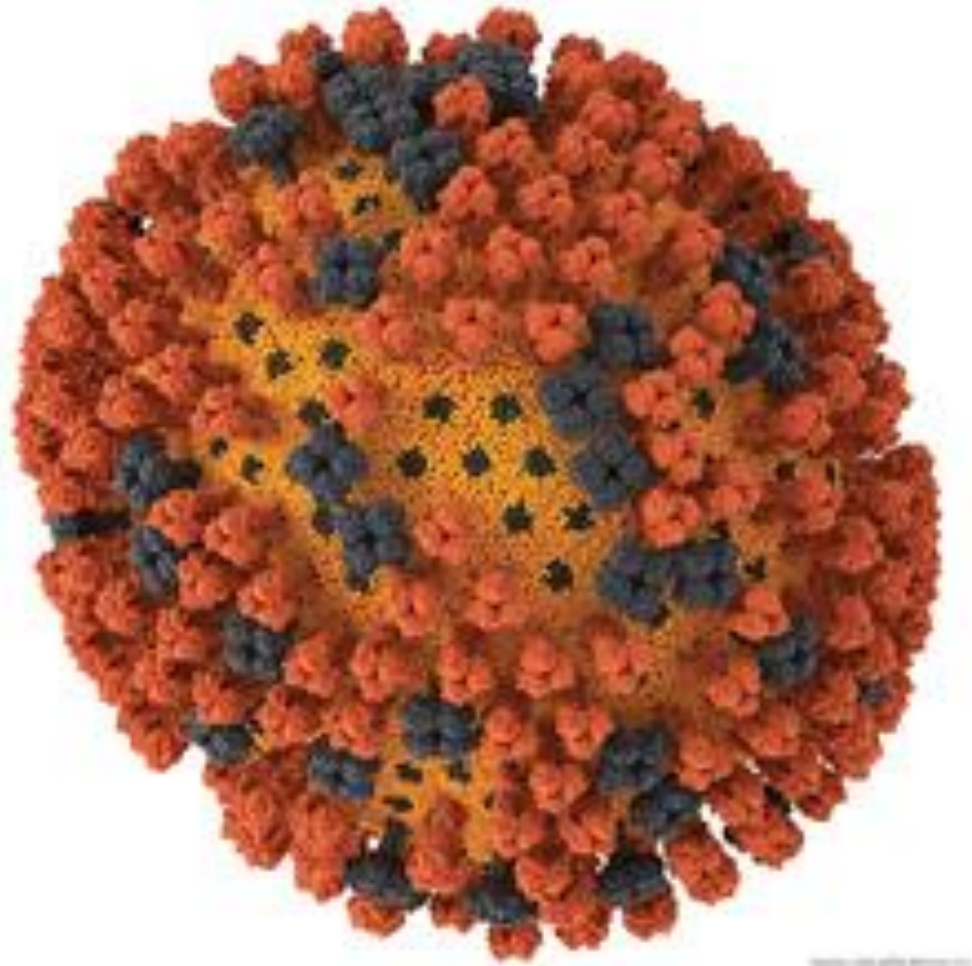
What are the  
causative agents?



# Bacteria



# Viruses



# Fungi, yeasts & molds



Protozoa,  
usually vector-borne  
as in West Nile virus



Ectoparasites, causing lice, scabies, flea infestations, etc.



What about multi-drug  
resistant organisms?



How do infectious agents  
“travel” to the next susceptible  
person? (Mode of Transmission)





# Droplet transmission



# Airborne transmission

# Contact transmission



Where do infectious agents  
“hide”? (Reservoir)



# Reservoirs

- ✓ humans
- ✓ animals
- ✓ environment



# Human Reservoirs

- ✓ acutely infected person
- ✓ carrier
- ✓ colonized person





DID YOU KNOW THERE ARE MORE MICROSCOPIC BUGS LIVING ON YOUR BODY, THAN THERE ARE PEOPLE ON EARTH.

YUCK!

DID YOU KNOW THAT THE GROUND WE ARE STANDING ON IS MADE OF LIVING TISSUE.

YUCK!

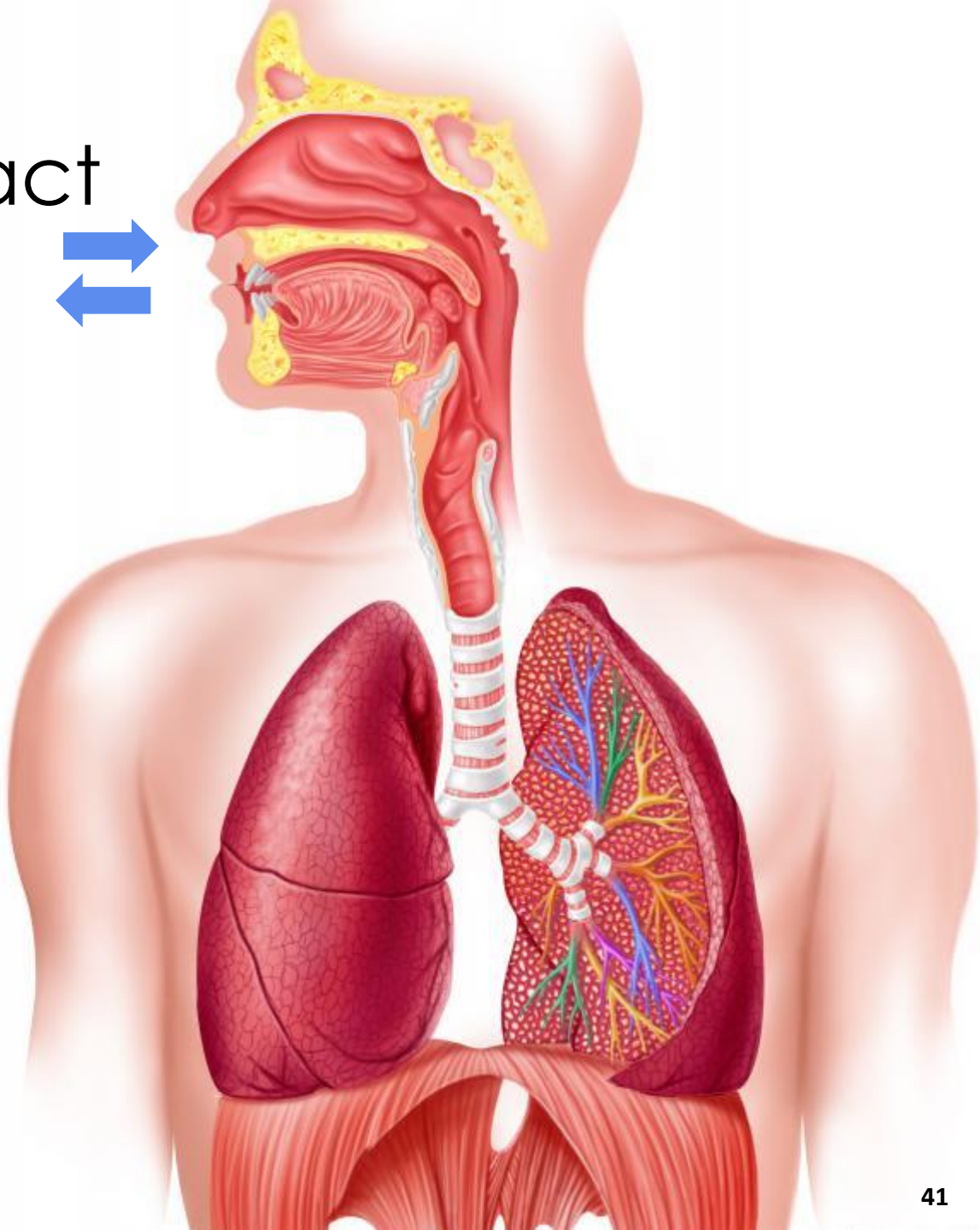
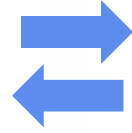
Alex Ruffi

How do infectious agents  
“get in and out” of us?  
(Portals of Entry & Exit)

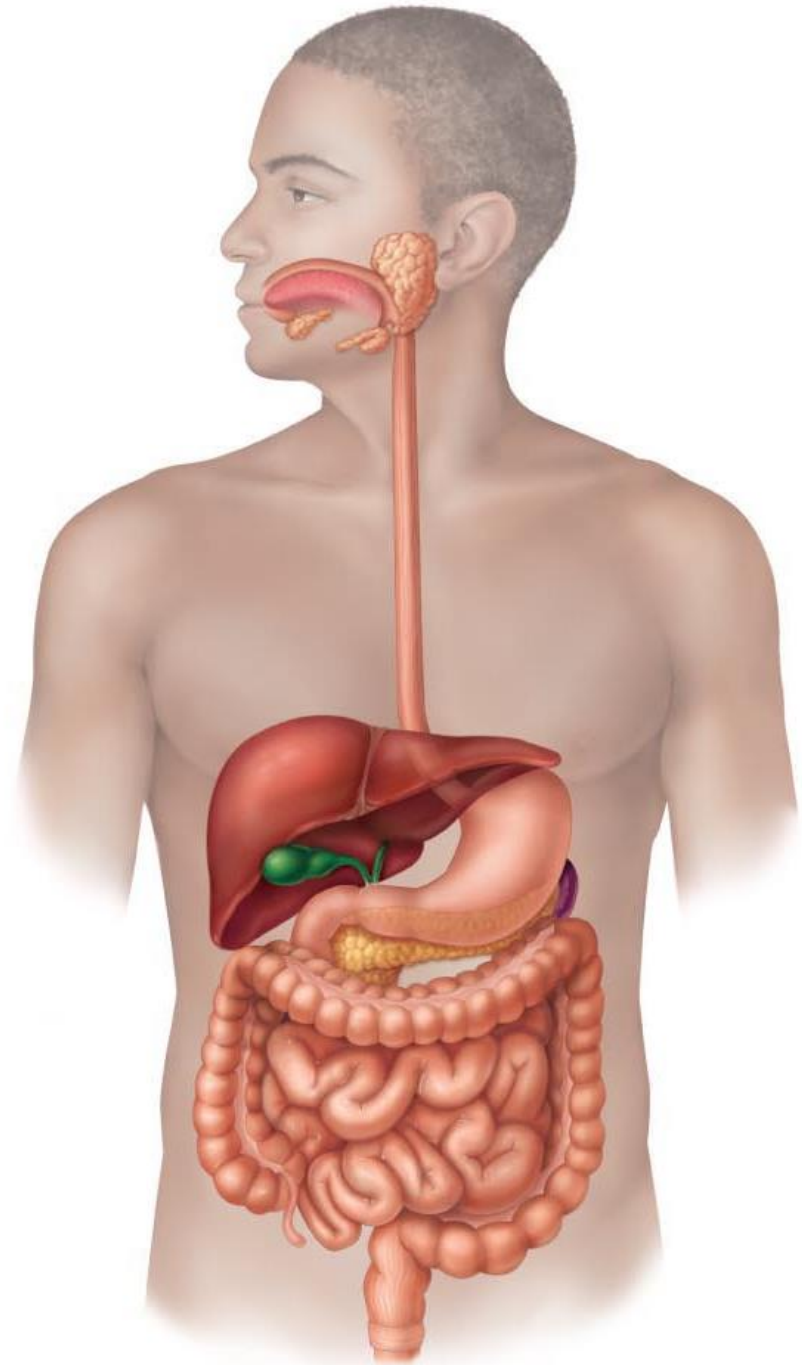




# Respiratory tract



# Alimentary tract



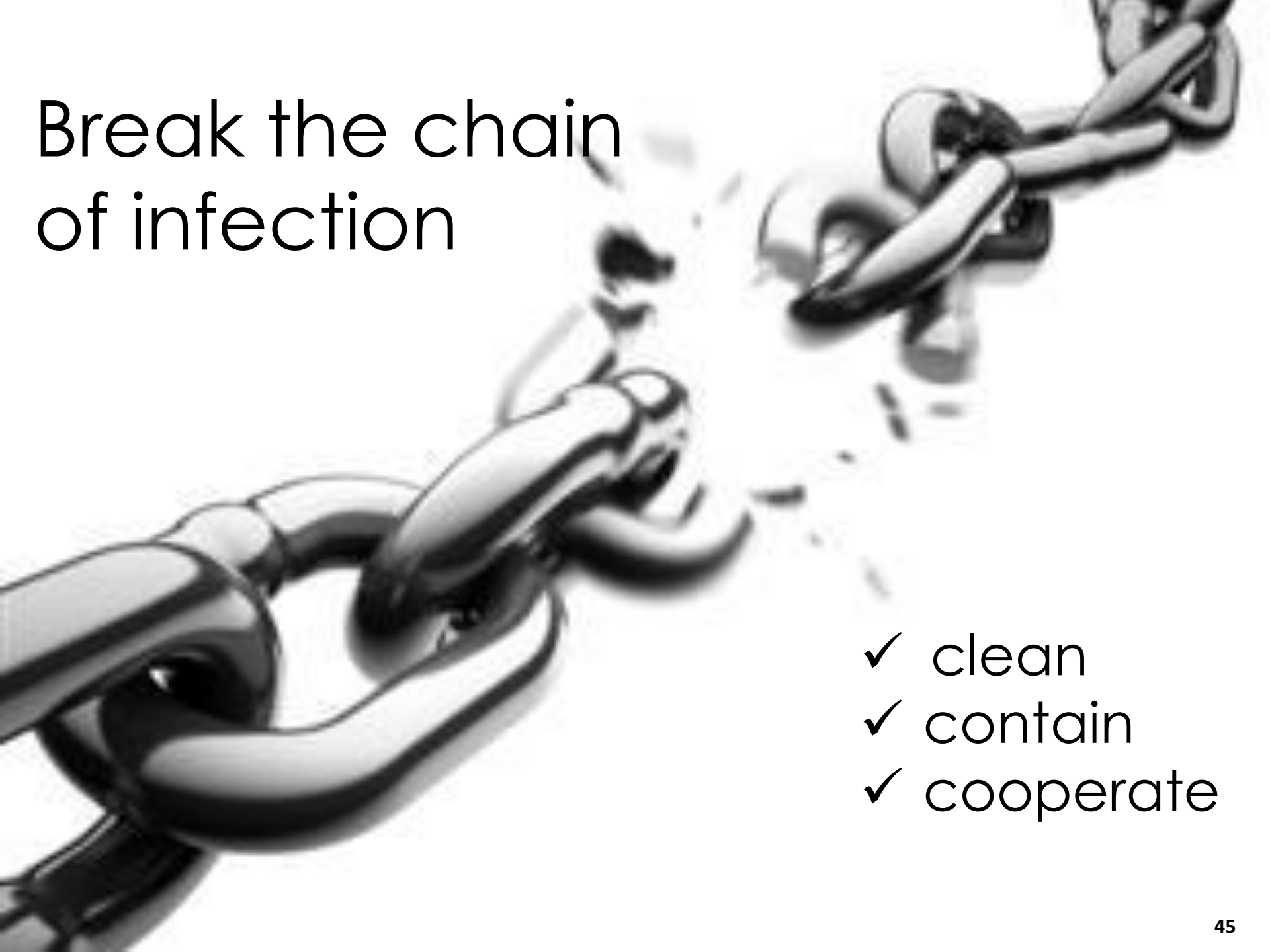
# Skin



How can infections be prevented in school settings?



# Break the chain of infection



- ✓ clean
- ✓ contain
- ✓ cooperate

# Hand hygiene



# Clean & disinfect

- ✓ Frequently touched surfaces
  - Door knobs
  - Diaper changing tables
  - Cabinet handles
- ✓ Equipment
  - Lifts
  - Wheelchairs
  - Mats
  - Slings

You can't disinfect dirt....

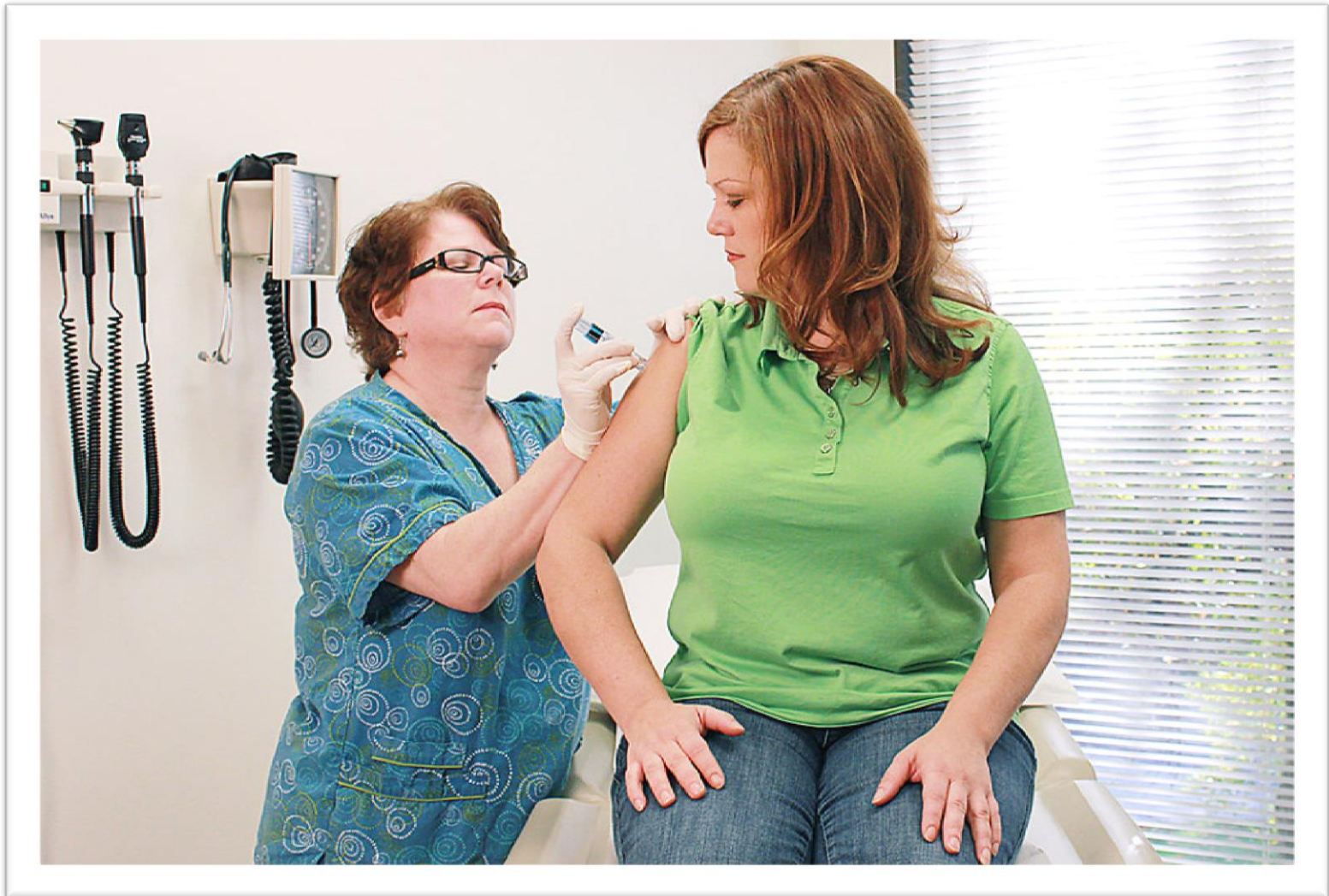






One-wipe, one-application

# Contain organism spread by vaccination of susceptible persons



Use personal  
protective  
equipment  
(PPE)



- ✓ Exclude students according to school district criteria



# Maximize cooperation

- ✓ Communicate
- ✓ Educate
- ✓ Monitor compliance



# Infection risks in schools can be effectively decreased by:

- ✓ Maintaining a clean environment
- ✓ Containing infective organisms
- ✓ Maximizing cooperation

# References

- CDC (2014). *Guide to Infection Prevention for Outpatient Settings*.
- CDC (2015). Carbapenem-resistant Enterobacteriaceae (CRE) Infection: Patient FAQs.
- CDC (2013). Information and Advice about MRSA for School and Daycare Officials.
- CDC (2009). MDRO Prevention and Control.
- CDC (2011). Infectious Diseases at School.

# Helpful Resources

- Aronson, S.S. & Shope, T.R. (2013). *Managing Infectious Diseases in Child Care and Schools*, 3<sup>rd</sup> ed. American Academy of Pediatrics.
- *Caring for our children: National health and safety performance standards; Guidelines for early care and education programs*, 3<sup>rd</sup> ed. American Academy of Pediatrics <http://nrckids.org>.