INFECTION CONTROL:

MRSA AND OTHER RESISTANT GERMS

Objectives: At the end of this class, you will be able to:

1. Discuss the difference between bacteria and viruses.
2. Explain why some antibiotics no longer work.
3. Describe MRSA and how to prevent it.

Introduction

Germs are all around us and in us. Some of these germs help us. Others lead to an infection. Many harmful germs can be killed with antibiotics. Others, over time, have changed their structure to protect themselves from medicines. These germs have become resistant to antibiotics. This has become, and continues to become, a very severe problem. People that have these resistant germs may die because our antibiotics do not kill them.

What Are Germs?
Our world is filled with many very, very, tiny living beings. These living things consist of one cell, the most basic unit of life, but these single cells do sometimes group up and form large clumps. These beings are found in the water, in dirt, in the air, on the body, and inside the human body. The human eye can not see these tiny beings. Special microscopes are used to see them in the lab. There are couple of types of these beings. There are bacteria, viruses and fungi.

Some of these tiny living beings are good. They help us to stay in good health. For example, we have good ones in our intestinal system. They keep us from getting other infections. These beings are called resident flora because they live in the normal human body. Some of these good ones live in one part of the body without leading to illness, but they can make us sick when they move to another part of the body. For example, E. coli lives in the large bowel, but, when it moves to the urine tract, it will cause an infection. This is the reason that the female must always wipe from the front to the back and not from the back to the front after using the toilet.

Some of these tiny beings that are found in and on the normal human body are below.

- Skin and nose- *Staph*
- Mouth- *Step*
- Bowels- *Step and E. coli*
- Vagina- *Candida*

Other tiny beings, called *germs*, harm us. They can cause an infection in a normal person and people with some illnesses. For example, the strep germ can cause a sore throat or a bad infection in a child that is healthy. The flu virus can cause the flu and the person will become ill. The AIDS virus leads to HIV/AIDS. The TB bacteria causes TB.
Some of these germs are very strong and powerful. Others are weak. Some can lead to a small infection. Others can lead to a very serious infection and even death. Some, like the common cold, do not cause a lot of damage. Others like HIV can lead to a very bad infection and even death. Some germs affect a small area. Others affect the entire body. For example, the skin can get a very small infection that does not travel to other parts of the body. These sores usually heal on their own in a short time unless the person has a problem with healing. But, other germs, like Staph, can travel in the blood and infect the entire body. These infections are very serious. They often lead to death.

Infections can come and go very quickly (acute) and some will be in the person for the rest of their life (chronic). For example, a common cold comes on and goes away very fast. HIV lasts a entire life time.

**Who Gets Infections Fastest?**

There are some groups of people that are at great risk. These groups include:

- People with serious diseases (AIDS/HIV, cancer)
- Older people
- Young children
- People taking some medicines (cancer medicines)
- People getting some treatments (catheters, IVs)
- People that live and/or work in crowded places (prisons, schools)
- People who do not get vaccines

Some cells that are normally found around our body in the world, on our own body and in our body do not cause infection unless the person has a serious disease. For example, people with cancer and HIV will get infections that other normal people do not get. They get them because their body is weak and not able to fight the germs off. People with this problem will become infected faster than people who are well.

Old people are at risk because their body gets a weak immune system as they get older. People with this problem will become infected faster than people who are younger. They can not fight off germs as well as younger people. Some medicines, like steroids, and treatments, like an IV and chemo for cancer, make it harder for people to fight off the germs. Chemo makes the body and the immune system weak. IVs allow germs on the outside of the body to enter the body and infect the inside of the body. These people will get infections faster and more often than people who are not taking these medicines and treatments.

People in crowded places are also at risk because they are near other people who can spread the germ from person to person. People in jail, people on an airplane, people who live in a groups setting, like a nursing home, college dorm, boarding house or hospital, and young children in schools are examples.

Years ago, people used to die from some infections, like smallpox, until a vaccine or shot was used to prevent it. Infants, young children, older adults and people with a long term chronic disease should get certain vaccines to prevent infections. For example, an infant and young child will begin to get a number of them after they are born to protect them. They will get shots so they cannot get things like mumps and measles. Older people and people with a chronic disease, like lung disease, should get the flu shot to protect themselves against the flu.

**The Chain of Infection: How Germs are Spread**
Infections can spread to a person when germs:

- are able to leave the body,
- have a means of transportation and
- can enter another body

Germs are everywhere. They are in the air, on our body, in our body, on our clothes, on and in food, in liquids, in human waste, on table tops, bed sheets, flowers and everywhere else.

Nursing assistants can do many things to prevent the spread of germs. We must keep foods safe. We must make sure that patients' rooms are clean and without dust. Even dust carries germs through the air.

Nursing assistants cannot prevent germs from leaving someone's body. Germs will leave a person's body when they cough, sneeze, move their bowels and when they have a draining wound. We have no control over a sneeze and a cough, but we do have control over the tissues that someone is using when they sneeze or cough. Tissues are a way for germs to move from one person to another.

Tissues and our hands are vehicles for germs, just like a car is a vehicle for us to move from one place to another. We cannot get too far away to a store, work or church unless we have a car or another mode of transportation to get us from our house to where we want to go.

Germs cannot move from one place to another unless they, too, have a means of transportation. If we take this away from them, they cannot move from one person to another. Tissues, hands and all other items that have, or may have, body fluids can move germs from one person to another. We can stop the spread of infection when we take the germs' transportation away.

We can break the cycle of infection and stop infections from moving from one person to another when we:

- wash our hands properly before and after EVERY patient contact,
- wash our hands properly before and after EACH task we do,
- handle all items that have, or may have, germs in the proper way and
- do other simple things like keeping dirty bed sheets away from our clothing.
EVERYONE must control infection.

**What Kinds of Living Things Can Lead to An Infection?**

A number of other things can lead to an infection. Some of these things are:

- Bacteria (strep, staph)
- Virus (HIV, common cold)
- Fungus (yeast like candida, and molds)
- Worms (hook worm and tape worm)
- Insects (flea, tick and mite)

**What is the Difference Between Bacteria and Viruses?**

Bacteria are single-cell beings that are found all over the world, in the air, on things like door knobs, inside the body and outside of the body. Most will not cause us to become sick when we are normal and not weak. Some help us to stay well. Still more can make us very sick. Some of the infections that they can cause are:

- Urine infections
- Sore throats
A virus is smaller than a bacteria. They can not live outside of the body. They invade the healthy cells of the body and they multiply. A virus can lead to:

- Colds
- Flu
- Coughs
- Bronchitis
- Sore throats
- Some ear infections

**What is an Antibiotic?**

An antibiotic is a drug that fights bacteria. The first one was penicillin. It was discovered in 1927. This was a very big thing. Many people died from a lot of infections before this time. After this time, many of these infections could be cured. People no longer got sick and died from many kinds of bacteria.

Some of these drugs are made from things that are made by nature (fungus). Others are not found in nature. They are made in the lab by a scientist. Some of these drugs kill the germ. Others stop the growth and multiplication of the germ.

These Drugs Kill Bacteria.

They do **NOT** Kill a Virus.

They do **NOT** Kill a Cold.

They do **NOT** Kill the Flu.

**Do Antibiotics Always Work?**
The answer to this question is NO. They do not always work. Over the last many years people took these drugs when they were not needed. They took these drugs over and over for things like a cold and the flu which they do not kill. People took these drugs over and over again even though they do not fight a cold or a flu. A cold and the flu are viruses not a bacteria. As said before, these drugs only work with a bacteria.

Why Do People Take These Drugs for a Virus?

Doctors give these drugs to the patient because the patient asks for them. People think that these drugs will kill the cold or flu germ when we know that they do not. Many doctors give these drugs to the person who asks for them simply because they do not want their patient to go to another doctor to get these drugs when they say “no”. People have to learn about these drugs. People have to learn what these drugs are used. They have to learn what they should NOT be used for. People have to learn that these drugs are used for a strep throat but NOT for a cold or the flu. Doctors also have to learn how to say no to their patients.

Doctors have to stop giving these drugs to people with a cold or the flu. Doctors must not give these drugs to people unless the doctor knows that the person has an infection from a bacteria. This is done by taking a culture and waiting to see what is found under the microscope. After the germ is seen and identified, the next step is to find out which drug, if any, can be used to fight this specific germ. Then, and only then, should the doctor give an antibiotic to a patient.

Why Do Some Germs Resist Antibiotics?

People and other living things, like germs, learn. They learn how to solve a problem when there is one. People learn how to go to the bank and put money into it when they get a phone bill. People learn how to wear warm clothes when
it is cold outside. The police learn how important a bullet proof vest is when they are out in the streets. These vests save their life. Soldiers learn to wear body armour so they do not get killed by the enemy’s bullets.

Germs also learn. They learn how to change when they sense that an antibiotic is in their area. They put on and wear a “bullet proof vest” to protect themselves. When they are safe, they multiply into many, many other germs with the same protection. The more people take antibiotics, the more these germs resist the antibiotics. They protect themselves. Soon, the antibiotics do not work anymore. They can no longer kills the germs. They are now useless. For example, in the past TB was killed with a special drug. Now, some TB drugs are useless because the germ has learned to resist it. Also, the *staph* bacteria used to be killed with antibiotics. Now, staph resists these drugs. This happens because some people have taken too many over their life time. They have abused these drugs. Now, they may get an infection that can not be cured. These drugs are also found in food, water and some soaps so this adds to the problem.

**This is a problem for the person BUT IT IS ALSO A PROBLEM FOR OTHER PEOPLE.**

This person can spread this germ to other people who will also not be cured because the germ will resist antibiotics. One of the biggest threats to the lives of our patients is the drug resistant *staph* germ. This *staph* spreads from person to person and anitibiotics are not always able to kill it. This *staph* germ is called **MRSA.**

**Everyone must be VERY concerned about MRSA!**

**What is MRSA?**

MRSA is an infection that is caused by the *Staphylococcus aureus* bacteria or *staph*. It is also called MRSA. MRSA stands for methicillin-resistant *Staphylococcus aureus*. It is a kind of germ that resists antibiotics. It can sometimes lead to death.

MRSA can be found in health care places, like hospitals and nursing homes. It is also found in the community. The people that are most at risk for it are old people and people that are weak and cannot fight it off. Now, however, more and more healthy people are getting it. For example, people that go to a gym may get it when they share towels and other personal things.

Staph skin infections, including MRSA, start with small red skin bumps that look like a pimple or a spider bite. These bumps then turn into a deep and painful abscesses. Sometimes these germs stay on the skin and do not travel to other parts of the body. At other times, they can enter the bones, blood, heart and other parts of the body. Many get pneumonia.
*Staph* is normally found on the skin or in the nose of about one-third of people. Most do not get sick from it although they can pass these germs to other people who may not be as lucky. These people can get sick from it.

**Who is At Risk for MRSA?**

The following groups are at great risk for the community form of this germ:

- Young children
- People that do sports that involve skin to skin touch and possible cuts and scrapes (football, basketball)
- People that share towels, razors, uniforms, etc.
- People with a weak immune system
- People that live in crowded places (group homes, dorms, prisons)
- People that live in dirty places
- People that have close contact with people that work in health care

The following groups are at risk for the health care related MRSA:

- People who are, or have been, in a hospital or another health care facility like a group home, assisted living house or a nursing home
- Old people, weak people, people with wounds or burns
- People with things that have been placed inside of their body (feeding tubes, IV lines, etc.)
- People who are getting antibiotics

**How Is It Treated?**
The first step is to find out that a person has an infection. The signs of infection are wound:

- redness,
- warmth,
- soreness,
- pus or other fluid coming from it, and
- fever

The second step is to find out exactly what germ is at work. Lab tests are done to find out if it is MRSA. MRSA becomes the known cause when it is found in a skin or nose lab sample.

At the current time, some antibiotics can still fight MRSA for some people and not others. The last step is treatment. Some can be drained by the doctor without using any drugs. This is done whenever possible. Others need an antibiotic in the hopes that the infection can be cured.

**Prevention: What You Can Do in Healthcare**

Health care is fighting back against MRSA. They are watching how people work and what they do, or do not, follow basic infection control practices. They are also using special things like catheters that are coated with an antibiotic in order to prevent an infection.

The best way to prevent it, however, is still with good handwashing. Yes, regular and simple handwashing. Handwashing and infection control procedures prevent MRSA. Things like gloves and gowns also help.

People that have MRSA are placed in isolation to prevent its spread to other people, including other patients, staff and visitors. Handwashing and wearing special things, like a gown, must be done by all people who go into that room.
Remind your patients to wash their hands often. Below, you will learn about when and often all people including your patients, must wash their hands.

**When to wash your hands**

People must wash your hands when they touch people, surfaces and objects. Germs add up and add up the more that people touch things during the day. Germs enter the body whenever a person touches the nose, mouth, or eyes. So, people must wash their hands over and over again many times throughout the day.

Also, people must always wash their hands before they:

- care for a person,
- make a meal, and
- eating

People must always wash their hands after they:

- care for a person,
- make a meal especially when it is raw meat or poultry,
- use the toilet,
- change a diaper,
- touch an animal, an animal toy, a leash or waste,
- notice that the hands are dirty,
- blow the nose, cough, or sneeze and
- handle garbage or other dirty items

**How to wash the hands**
It is best to wash the hands with regular soap and water. Hand sanitizers do not replace good hand washing with soap and water.

These are the simple hand washing steps:

1. Wet the hands with running water.
2. Apply soap.
3. Lather the soap up well.
4. Rub the hands strongly and with vigor for at least 20 seconds. Remember to scrub and rub ALL surfaces. Do not forget the wrists, the backs of the hands, between the fingers and under the fingernails.
5. Rinse well.
6. Dry the hands with a clean paper towel or an air dryer.
7. Use a towel to turn off the faucet. Do not touch it with clean hands. It is dirty.

How to use an alcohol-based hand sanitizer

These are a alternative to soap and water when soap and water is not available. These are the simple steps to use them:

1. Apply it to the palm of the hand to completely wet the hands with it.
2. Rub your all parts of the hands until they are dry. This may take up to 25 seconds until they are dry.
Prevention: What You Can Do in Your Own Community

- Wash your hands. Carry, and use, a small bottle of hand sanitizer containing at least 60 percent alcohol for times when you do not have soap and water.

- Keep personal items personal. Do not share things like towels, sheets, clothing or razors.

- Keep all sores covered. Keep cuts clean and covered until they are all healed.

- Shower after all sports activities.

- If you have an infected area, contact your doctor and get tested.

- Do NOT abuse antibiotics.

You must help your young patients to learn how and when to wash their hands. Show them how to do it. Remind them to do it when it is necessary. Teach them to sing the "Happy Birthday" song two times before they stop rubbing their hands during the washing process.

Hand washing is very important for young children especially when they are sick or in groups outside of their own private home.

Summary

MRSA is very serious. It can lead to death. Nursing assistants and others in healthcare must follow proper infection control and hand washing procedures so their patients will be free of this infection.