## October 2016 Commitment to Care Quality Topic

# Antibiotic Stewardship; Get Ahead of the Curve with the Basics of Infection Control Prevention

What is this new "buzz" all about? Are we *stewards* of antibiotic therapy? We have always strived to medicate our residents with antibiotics appropriately…the right resident, the right time, the right dose, for the right reasons. We don't want our residents to have an infection that we do not treat. We want our residents to be well and as healthy as possible. Haven't we always practiced antibiotic stewardship? The answer to this perplexing question is yes and no. Just as with many other healthcare practices, the standard of practice in the use of antibiotics has changed over the years. We have learned from our past and are continually improving our practices. To understand why this change has occurred we will look back at the use of antibiotics over the past few decades and review what we have learned.

## *Background*

Soon after the use of penicillin began in the 1940's, discoverer Sir Alexander Fleming recognized that inappropriate use of this new wonder drug would lead to resistant bacteria. During his Nobel Prize address in 1945, he warned that the inappropriate use of antibiotics would cause human infections to become resistant to these drugs.[1] Very simply stated, the bacteria making us ill begins to mutate and forms a resistance to the antibiotic drug prescribed to treat it.

During the next several decades new and stronger antibiotics were developed to treat bacterial infections. By the 1970's broad spectrum antibiotics were in use with the ability to kill a larger variety of bacteria. Again, within a few additional decades more antibiotics were developed and initiated to treat bacterial infections. Commonly, within 4 – 5 years following the release of these antibiotics, the microorganisms being treated with that drug became resistant to the drug. Adding to this concern, in the past decade fewer and fewer new antibiotics has been developed. Currently there are only a few of pharmaceutical companies developing new antibiotics.

## *Where are we today?*

As a result we have a growing list of multiple drug resistant organisms (MDROs) with less and less drug options to treat them.

MDROs are an international safety crisis now. The Centers for Disease Control and Prevention (CDC) and the Department of Health and Human Services (HHS) estimates that annually at least two million illnesses and 23,000 deaths are caused by antibiotic-resistant bacteria in the United States alone.[2] On September 18, 2014 a Presidential Executive Order was released to combat antibiotic resistant bacteria, thus improving antibiotic stewardship in the United States. Currently there are microorganisms with very few or only one antibiotic course of treatment (e.g. carbapenem-resistant enterobacteriaceae, CRE). The risks of our residents acquiring a "superbug" infection are huge! Research show 25 – 75% of antibiotic use and 60% of topical antimicrobial use in long term care settings is inappropriate.[3] Similarly 70% of all long term care residents will receive at least one course of antibiotic therapy annually. This high use of antibiotics leads to the mutation of the microorganisms causing the development of antibiotic resistance.

## *Is it true that the only good bug is a DEAD Bug??*

Why don't we just give all residents a maintenance dose of antibiotics indefinitely so they won't get an infection? Science has proven the body needs "bugs" to survive. We cannot live in a microorganism free world. Each of us have our own little "germ world" living in and on our bodies. We co-exist in this ecological system and it is a good thing.

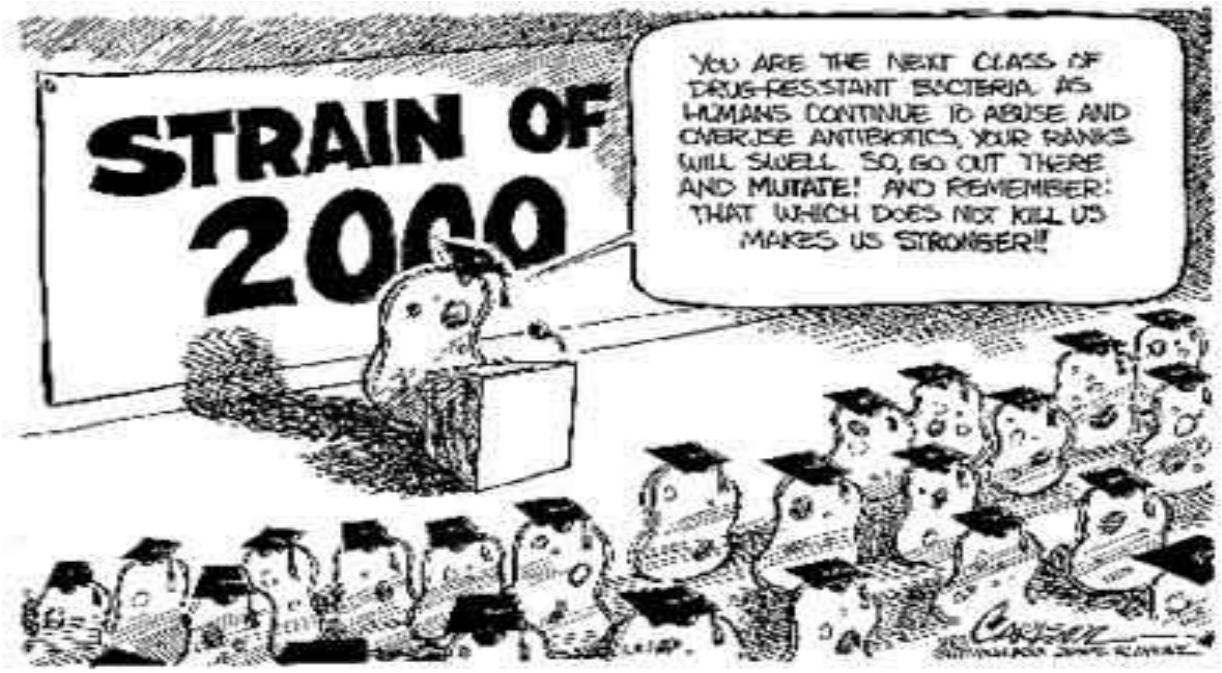

Our germs protect us and fight off invading germs that try to move into our bodies. We are all happy and healthy when we co-exist. When we take antibiotics, the drug not only kills the "bad" bugs that are trying to take up residence in our bodies, but also affects our "good" bugs that are trying to protect us. As the battle rages in our bodies, the good and bad bugs fight for survival. They camouflage their appearance, put on protective armor and create their own weapons to defend themselves against each other and the antibiotic trying to kill them. This mutation causes the microorganisms to become resistant to the antibiotic, so the bug survives. Now, the microorganisms that live in and on our bodies are a little different too. Our

body eco-system has changed and our ability to fight off infection also changed. Over time our bodies recover from this insult, but repeated use of antibiotics particularly in a relatively short period of time can keep knocking us back down. Some of our good bugs that lived in harmony with us have changed and may now make us sick as they also try to survive.

Simply stated, when a resident is sick and has signs and symptoms of a bacterial infection he/she needs antibiotics to kill the bad bugs. So not to kill off too many good bugs, the resident needs to take the antibiotic long enough to get rid of the infection, but then needs time to allow the body to recover from the infection and the antibiotic use.

***What is the answer to this germ war? What can be done to fight infection but keep our own microorganisms safe?***

***The answer is Antibiotic Stewardship***



## *How do I recognize an infection in the long term care resident?*

In 2012 the Revised McGeer's Definitions of Infection in Long Term Care" was published by The Society for Healthcare Epidemiology of America (SHEA).[4] While these definitions of infection were developed for surveillance purposes, they provide guidance in identifying infections in our geriatric residents. Common signs and symptoms of infection in the elderly include pain (generalized or localized), fever (generalized or localized), and body aches/malaise. Additional signs I may see based on the location and source of the infection include: cough, congestion, redness, swelling, drainage and foul odor. Laboratory test results help support the signs and symptoms of infection.

Bacteria present in the body without signs and symptoms of infection is considered "colonization", meaning there are microorganisms present, but they are not making the resident sick. Signs and symptoms are the key component in identifying if an acute infection exists in the elderly.

## *Are we stewards of antibiotic therapy?*

The answer is yes. We are entrusted to advocate for our residents in the care they receive. We must use our skills to assess and educate about antibiotic use and must guide and monitor our facility practices.

1. http://www.whitehouse.gov/blog/2014/09/18/pcast-releases-new-report-combating-antibiotic-resistance
2. http://www.whitehouse.gov/the-press-office/2014/09/18/executive-order-combating-antibiotic-resistant-bacteria
3. Nicolle LE, Bentley DW, Garibaldi R, Neuhaus EG, Smith PW. Antimicrobial use in long-term–care facilities. *Infect Control Hosp Epidemiol* 2000;21(8):537–545
4. http://www.jstor.org/stable/10.1086/667743

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