Drug Resistant Bacteria; They may very well Outlive Humanity!

Welcome to Flu season everybody! It has arrived.

Every Fall we start seeing more and more viral respiratory illnesses in the office. Folks will come in for "an antibiotic for my flu". It won't work! The "flu" is caused by a virus, antibiotics kill bacteria.

Flu by definition is an infection of very sudden onset; typically within an hour you go from feeling OK to "have to get better to die", with fever usually >101'F, headache, body aches, fatigue, malaise and assorted respiratory complaints. Notice that the flu typically does NOT cause nausea/vomiting/diarrhea! Tamiflu has been hitting headlines as a great anti-viral and last year was being stockpiled by many folks due to fears of the bird flu. It's not a good idea to stockpile antibiotics, and Tamiflu is not completely free of risks.

Bird flu is another concern but what IS it? It's a flu that affects birds, obviously. Flu viruses can infect one species of animal and not another. The problem is that viruses mutate and change. A virus that infects birds can change enough so that in high enough concentrations it can infect people. This has already happened. The next mutation is the one that we fear the most; that it will change enough to pass from person to person which has not yet happened. It's probably just a matter of time before that happens.

Remember Hantavirus from the four corners area of the southwest US? Hantaviruses (genus Hantavirus, family Bunyaviridae) are a group of at least 25. antigenically distinct viruses carried in rodents that was able to mutate and infect humans.

SARS? That's a disease now known to be caused by Corornaviruses, a class of virus that historically affects the GI tract and upper respiratory systems of wild and domesticated animals but was able to mutate and cross over to infect humans.

Are all mutations this dangerous? No, luckily most mutations are thought to be lethal; the organism can't survive without the change in their genetic code. Unfortunately some are lethal to the rest of us…

So many people insist on antibiotics however, that many physicians and mid-level providers such as nurse practitioners and physician assistants will succumb to the pressure and prescribe useless antibiotics.

Big Mistake!

Antibiotics kill bacteria. The right bacteria in the right location are essential for life and for a properly functioning immune system. Kill 'em all and we'll be doing ourselves a potentially lethal disservice! If you DO need an antibiotic, great, use it! But when the antibiotic is completed, start on a course of Probiotics, the "good bugs" to repopulate the GI tract and maintain a healthy immune system.

Good old Vitamin C in high doses is about the best thing we can do for ourselves when we have infection. It's literally the "bullets our immune system uses to kill bad bugs". Folks will come in saying they took their vitamin C—500 mg! "Spit in the wind" is all I can say to that. It's essential to take it frequently as the kidneys start getting rid of it as soon as you take it, once a day is NOT enough! I recommend 4,000-5,000 mg every 4 hours if possible. At very high doses like this it acts as an antibiotic and antiviral itself.

But what about these drug-resistant bugs the title of the article mentions? Where do they fit in? Simple, when you have some "left over" antibiotic and take just a few of them and don't take them right, the bugs that survive learn to develop resistance; becoming immune to that particular antibiotic. This is why you can't walk into the local pharmacy and pick up a pound of penicillin unless you have a professional healthcare license.

When are antibiotics indicated and how do we tell if the infection is likely to be bacterial instead of viral? THAT is the million dollar question! The things that seem to indicate a bacterial infection are fever >100'F, duration typically longer than 7-10 days, tenderness of the sinuses with facial pain/pressure (for sinusitis), chest pain on breathing and shortness of breath possibly with mental status changes for lung infections, urinary pain/urgency/frequency with back pain, nausea/vomiting for urinary infections. Basically it's best to seek professional help if you're concerned, many doctors with decades of training and experience can be fooled by these infections—don't feel bad if you are unsure (maybe that's why they call this the PRACTICE of medicine!).

Our agricultural industry puts antibiotics in many animal feeds to boost weight gain and keep the livestock "healthy". The residues of those antibiotics find their way onto our dinner plates and have effects on us and on the "good bugs" in our guts. Organically grown meats and plant products are by far the best food sources that can be had, devoid of pesticides, hormones and antibiotics used in commercially grown food products. Wherever/whenever possible, try to eat organic, it's not just better FOR you, it TASTES much better too!

What kind of resistant bugs are out there?

How about the penicillin resistant pneumococcal and streptococcal organisms? They even have their cousins the famous "flesh eating bacteria". These are bugs that are able to get genetic information loose in their microenvironment and assimilate the genes and plasmids that enable them to become even more virulent and lethal. Their survival advantage is great for them but lethal for the rest of us!

Unless you've been living under a rock these last few years you've heard of Methcillin-Resistant Staphylococcus aureus (MRSA for those of us with limited vocabularies). Staph is a common skin organism that has been around probably since before we (mankind) have been. There are numerous cousins in this family, most are pretty good guys such as S. epidermis, but S. aureus has always been a bad guy with the ability to wreak havoc in our systems, producing lots of dirty little enzymes that help destroy tissue

and further infection. This little bug also acquired resistance to a variety of antibiotics, especially of the penicillin class. It used to be rare, found only in the sickest hospitalized patients. Now it's in the community in relatively healthy people and can even run through families quickly. It often starts out looking like a Brown Recluse Spider Bite with a localized hard sore area that frequently contains pus if it's lanced. How do we get rid of it if penicillin won't work? Vancomycin is a "big hitter" antibiotic with some nasty side effects and can only be given by intravenous (IV).

Something else can be done; combinations of various antibiotics so that if the bug becomes resistant to one, the other are still working. It's statistically more difficult for a bug to develop multiple resistant mutations simultaneously

Enterococcus is a bug that lives in the GI tract. It's typically an anaerobe, meaning that it will be killed by oxygen exposure. If it gets out of the gut however it can also cause major problems, especially in the urinary and respiratory tracts, systemic blood stream infections are also a big problem. It's recently become resistant to Vancomycin VRE is Vancomycin-Resistant Enterococcus and is another big developing problem in many hospitals.

Another class of gut bacteria that can become disease causers is the family Clostridium. You more mature ladies out there will love and respect it in that C. botulinum gives you "Botox", C. perfinges causes gangrene and C. dificil can cause severe diarrhea and GI problems. This class of bacteria is also commonly found in soil. Interesting little tidbit on C. dificil, the commonly used alcohol based foams and gels found throughout hospitals, food service areas etc. don't have much effect on it, so WASH YOUR HANDS WITH SOAP AFTER USING THE BATHROOM! At least 20 seconds—long enough to sing the ever popular "Happy Birthday" song to yourself—twice.

So what's the point of all of these wonderful cheery information? Let's work on staying healthy, listening to the medical professionals advice on when we do and do not need antibiotics and respect that advice.
It's also critically more important now than ever to practice good hygiene; hand washing, avoiding soiled areas, cleaning up periodically while preparing food. Hand sanitizers work well for most things but not for all as noted above.

Stay safe, live healthy!