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# MARCO's "*AETHER*" *Pronounced "Ether"*

**Healthcare & Radio in One Medium**

**Official Publication of the Medical Amateur Radio Council**

**137th Edition, 2000-2022**

A non-profit Corporation, founded in 1966, privately supported for the public good and dedicated to the advancement of Medicine through Amateur Radio.

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**(56th year), Edition # 137 Since Year 2000, August 2022 14607 Brewster Dr., Largo, FL. 33774**

# IMMUNOTHERAPY VS. CANCER TODAY

## IN THE LAST DECADE IMMUNOTHERAPY HAS BECOME AN IMPORTANT PART OF TREATING CANCER. THIS CAN BE DONE IN SEVERAL WAYS.....

*(This is complicated but very worthwhile—read twice)*

**Stimulating, or boosting, the natural defenses of your immune system so it works harder or smarter to find and attack cancer cells *and making substances in a lab that are just like immune system components and using them to help restore or improve how your immune system works to destroy cancer cells.***

Your immune system is a collection of organs, special cells, and substances that help protect you from infections and other diseases. Immune cells and the substances they make travel through your body to protect it from germs that cause infections. They also help protect you from cancer in some ways.

The immune system keeps track of all of the substances normally found in the body. Any new substance that the immune system doesn't recognize raises an alarm, causing the immune system to attack it. For example, germs containing substances such as proteins that are not normally found in the human body. The immune system sees these as "*foreign*" and attacks them. The immune response is capable of destroyng anything containing the foreign substance, such as germs or cancer cells.

The immune system has a tougher time targeting cancer cells, though. This is because cancer starts when normal, healthy cells become changed or altered and start to grow out of control. Because cancer cells actually start in normal cells, the immune system doesn't always recognize them as foreign.

Clearly there are limits on the immune system's ability to fight cancer on its own, because many people with healthy immune systems still develop cancer:

Sometimes the immune system doesn't see the cancer cells as foreign because the cells aren't different enough from normal cells.

Sometimes the immune system recognizes the cancer cells, but the response might not be strong enough to destroy the cancer.

Cancer cells themselves can also give off substances that keep the immune system from finding and attacking them.

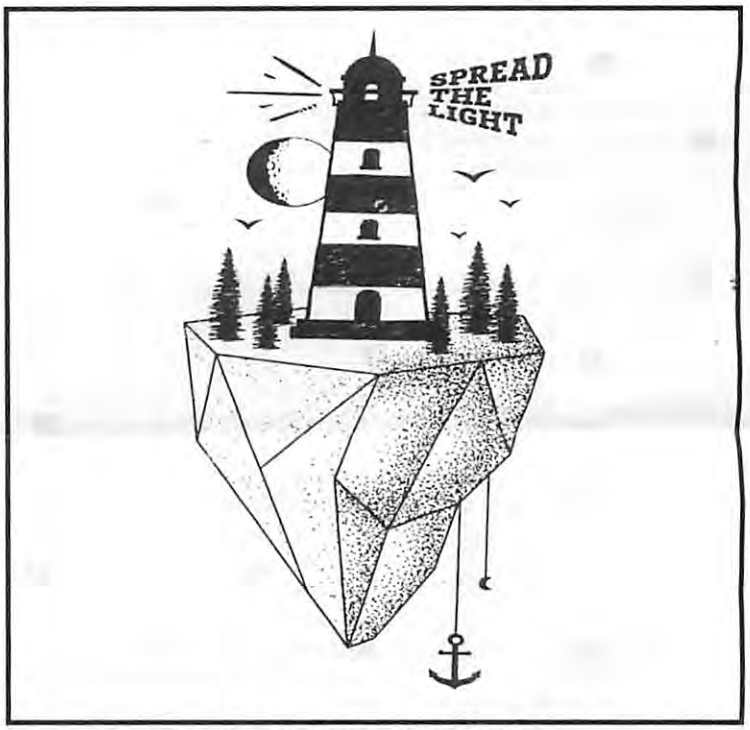
To overcome this, researchers have found ways to **help** the immune system recognize cancer cells and strengthen its response so that it will **destroy** them. In this way, your own body is actually getting rid of the cancer, with some help from science.

**Types of cancer immunotherapy:** There are several main types of immunotherapy used to treat cancer, and many are being studied.

**Checkpoint inhibitors:** These drugs basically take the "*brakes*" off the immune system, which helps it recognize and attack cancer cells.

**Chimeric antigen receptor (CAR) T-cell therapy:** This therapy takes some T-cells from a patient's blood, mixes them with a virus that makes the T-cells learn how to attach to tumor cells, and then

**Continued on Page Two**




## LATE BREAKING NEWS

**The next edition of AETHER will be via internet only in Oct. 2022.**

**If you are over 70 and taking low-dose aspirin, read page 8 for the latest up-to-date information as to whether you should STOP or CONTINUE this routine.**

**If you need Category I or II CME credit, contact *baycarecme.org for Cat 1,* it is up-to-date and courtesy to MARCO via Dr. Brown (*printed AETHER editor).* For Cat 2, tune in to MARCO Grand Rounds, Sundays, 11 am Eastern time on 14.342 MHz.**

**Certificate for submission to the State Licensing Boards is issued on demand by contacting *warren.brown1924@gmail.com* or check with Chip Keister, MD, N5RTF (504 812 8717) for details on the Sunday lectures on your personal computer.**

**It was the Marco consensus that we would continue the process of alternating the printed edition and on-line edition of Aether.**

**Chip Keister N5RTF wants to remind members that when band conditions are bad, members can listen to Grand Rounds livestream on our net online. These lectures are recorded allowing one to listen in later to the online archive.**
To Listen: Go to web page and archive: www.marcoaudio.net

Marco has a new President, husband of a *Past President,* professional corporate pilot, and avid Ham operator, Bernie Krasowski KD5QHV.

**WRITE TO US!**
**We welcome your comments. Email to Aether@marco-ltd.org Letters may be edited for brevity & clarity. Unedited member articles & graphics are not the opinions of MARCO-ltd.**

**MARCO NET SCHEDULE**

| DAY | EASTERN | FREQ. | NET CONTROLS |
|---|---|---|---|
| Any Day | On the Hour | 14.342 | Hailing Frequency |
| Sunday | 10:30 a.m. Eastern | 14.140 | CW Net, Chip, N5RTF |
| Sunday | 11 a.m. Eastern | 14.342 | Warren, KD4GUA |
| Wednesday | 8:30 p.m. Eastern | 7.22 | Harry, WB9EDP |

**MARCO'S CW NET IS NOW CALLED THE *"Bob Morgan Memorial Net"***
**Sundays, 10:30 am, 14.140 MHz**



**MARCO Grand Rounds is held Sunday at 11 a.m. Eastern Time; 10 a.m. Central; 9 a.m. Mountain, and 8 a.m. Pacific Coast time on 14.342. You qualify for one hour Category II CME credit with your check-in.**

gives the cells back to the patient so they can find, attach to, and kill the cancer.

**Cytokines:** This treatment uses cytokines (*small proteins that carry messages between cells)* to stimulate the immune cells to attack cancer.

**Immunomodulators:** This group of drugs generally boosts parts of the immune system to treat certain types of cancer.

**Cancer vaccines:** Vaccines are substances put into the body to start an immune response against certain diseases. We usually think of them as being given to healthy people to help prevent infections. But some vaccines can help prevent or treat cancer.

**Monoclonal antibodies (mAbs or MoAbs):** These are man-made versions of immune system proteins. mAbs can be very useful in treating cancer because they can be designed to attack a very specific part of a cancer cell.

**Oncolytic viruses:** This treatment uses viruses that have been modified in a lab to infect and kill certain tumor cells.

**MONOCLONAL ANTIBODIES AND THEIR SIDE EFFECTS:**

One way the body's immune system attacks foreign substances is by making a large numbers of antibodies. An antibody is a protein that sticks to a specific protein called an *antigen.* Antibodies circulate throughout the body until they find and attach to the *antigen.* Once attached, they can force other parts of the immune system to destroy the cells containing the *antigen.*

Researchers can design antibodies that specifically target a certain *antigen*, such as one found on cancer cells. They can then make many copies of that antibody in the lab. These are known as *monoclonal antibodies (*mAbs or Moabs).

Monoclonal antibodies are used to treat many diseases, including some types of cancer. To make a monoclonal antibody, researchers first have to identify the right antigen to attack. Finding the right antigens or cancer cells is not always easy, and so far mAbs have proven to be more useful against some cancers than others.

NOTE: Some monoclonal antibodies used to treat cancer are referred to as targeted therapy because they have a specific target on a cancer cell that they aim to find, attach to, and attack. But other monoclonal antibodies act like immunotherapy because they make the immune system respond better to allow the body to find and attack cancer cells more effectively.

**What mAbs are made of...**Monoclonal antibodies are man-made proteins that act like human antibodies in the immune system. There are 4 different ways they can be made and are named based on what they are made of. **Murine:** These are made from mouse proteins and the name of the treatments end in **"-omab."** **Chimeric:** These proteins are a combination of part mouse and part human and the names of the treatments end in **"-eimab." Humanized:** These are made from small parts of mouse proteins attached to human proteins and the names of the treatments end in **"-zumab.: Human:** These are fully human proteins and the names of the treatments end in **"umab."**

**Types of mAbs used treat cancer:**

Naked monoclonal antibodies: Naked mAbs are antibodies that have no drug or radioactive material attached to them. They work by themselves. These are the most common type of mAbs used to treat cancer. Most naked mAbs attach to antigens on cancer cells, but some work by binding to antigens on other, non-cancerous cells, or even free-floating proteins. Naked mAbs can work in different ways.

Some boost a person's immune response against cancer cells by attaching to them and acting as a marker for the body's immune system to destroy them. An example is alemtkuzkumab (Campath), which is used to treat some patients with chronic lymphocytic leukemia (CLL). Alemtuzumab binds to the **CD52 antigen**, which is found on cells called *lymphocytes* (which include the leukemia cells). Once attached, the antibody attracts immune cells to destroy these cells.

Some naked mAbs boost the immune response by targeting immune system checkpoints. (*See Immune Checkpoint inhibitors and their side effects.)*

Other naked mAbs work mainly by attaching to and blocking antigens on cancer cells (or other nearby cells) that help cancer cells grow or spread. For example, trastkuzumab (Herceptin) is an antibody against the HER2protein. Breast and stomach cancer cells sometimes have large amounts of this protein on their surface. When HER2 is activated, it helps these cells grow. Trastuzumab binds to these proteins and stops them from becoming active.

**Conjugated monoclonal antibodies...**Conjugated mAbs are combined with a chemotherapy drug or a radioactive particle. These mAbs are used as a homing device to take one of these substances directly to the cancer cells. The mAb circulates throughout the body until it can *find* and hook onto the target antigen. It then delivers the toxic substance where it is needed most. This lessens the damage to normal cells in other parts of the body. Conjugated mAbs are also sometimes referred to as *tagged, labeled,* or *loaded antibodies.*

**Radiolabeled antibodies:** Radiolabeled antibodies have small radioactive particles attached to them. Ibritumomab tiuxetan (Zevalin) is an example of radiolabeled mAb. This is an antibody against the ***CD20* antigen**, which is found on lymphocytes called **B cells.** The antibody delivers radioactively directly to cancer cells. It is made of both an mAb drug (*rituximab*) and a radioactive substance (*Yttrium-90).* Treatment with this type of antibody is sometimes known as radioimmunotherapy (RIT). The drug and radiation are delivered directly to the target cells because the mAb looks for the target, then the radiation affects the target and nearby cells to a certain extent.

**Chemo labeled antibodies:** These mAbs have powerful chemotherapy (or other) drugs attached to them. Examples include:

**Brentuximab vedotin (Adcentris),** an antibody that targets the CD30 antigen (found on lymphocytes), attached to a chemo drug called *MMAE.*

Ado-trastuzumab emtansine (Kadcyla, also called TDM-1), an antibody that targets the HER2 protein, attached to a chemo drug called DM1.

**Bispecific monoclonal antibodies...**These drugs are made up of parts of 2 different mAbs, meaning they can attach to 2 different proteins at the same time. An example is blinatumomab (Blincyto), which is used to treat some types of leukemia. One part of blinatumomab attaches to the **CD19 protein**, which is found on some leukemia and lymphoma cells. Another part attaches to CD3, a protein found on immune cells called *T cells.* By binding to both of these proteins, this drug brings the cancer cells and immune cells together, which is thought to cause the immune system to attack the cancer cells.

**POSSIBLE SIDE EFFECTS OF MONOCLONAL ANTIBODIES...**Monoclonal antibodies are given I.V. The antibodies themselves are proteins, so giving them can sometimes cause something like an allergic reaction. This is more common while the drug is first being given. Possible side effects can include: Fever, chills, weakness, headache, nausea, vomiting, diarrhea, low blood pressure, & rashes.

Compared with chemotherapy drugs, naked mAbs tend to have fewer serious side effects. But they can still cause problems in some people. Some mAbs can have side effects that are related to the antigens they target. For example:

**Bevacizumab (Avastin)** is an mAb that targets a protein called VEGF that affects tumor blood vessel growth. It can cause side effects such as high blood pressure, bleeding, poor wound healing, blood clots, and kidney damage.

**Cetuximab (Erbitux)** is an antibody that targets a cell protein called EGFR which is found on normal skin cells (as well as some types of cancer cells). This drug can cause serious rashes in some people.

**CAR T-cell Therapy and its side effects...** Your immune system works by keeping track of all the substances normally found in your body. Any new substance the immune system doesn't recognize raises an alarm, causing the immune system to attack it.

Chimeric antigen receptor (CAR) T-cell therapy is a way to get immune cells called T cells (a type of white blood cell) to fight cancer by changing them in the lab so they can find and destroy cancer cells. CAR T-cell therapy is also sometimes talked about as a type of cell-based gene therapy, because it involves altering the genes inside T cells to help them attack the cancer.

This type of treatment can be very helpful in treating some types of cancer, even when other treatments are no longer working.

**How CAR T-cell therapy works. Immune receptors and foreign** *antigens.* The immune system recognizes foreign substances in the body by finding proteins called antigens on the surface of those cells. Immune cells called T cells have their own proteins called receptors that attach to foreign antigens and help trigger other parts of the immune system to destroy the foreign substance.

The relationship between antigens and immune receptors is like a lock and key. Just as a lock can only be opened with the right key, each foreign antigen has a unique immune receptor that is able to bind to it.

Cancer cells also have antigens, but if your immune cells don't have the right receptors, they can't attach to the antigens and help destroy the cancer cells.

**Chimeric antigen receptors (CARS)....** In CAR T-cell therapies, T cells are taken from the patients's blood and are changed in the lab by adding a gene for a receptor (called a *chimeric antigen receptor or CAR),* which helps the T cells attach to a specific cancer cell antigen. The CAR T cells are then given back to the patient.

Since different cancers have different antigens, each CAR is mde for a *specific cancer's antigen.* For example, in certain kinds of leukemia or lymphoma, the cancer cells have an antigen called **CD19**. The CAR T-cell therapies to treat these cancers are made to attach to the CD19 antigen and will not work for a cancer that does not have the CD19 antigen.

**Getting CAR T-cell therapy...Collecting the T cells...** First, white blood cells (which include T cells) are removed from the patient's blood using a procedure called *leukapheresis,* patients usually lie in bed or sit in a reclining chair. Two IV lines are needed because blood is removed through one line, the white blood cells are separated out, and then the blood is put back into the body through the other line. Sometimes a special type of IV line called a central venous catheter is used, which has both IV lines built in.

The patient will need to stay seated or lying down for 2 to 3 hours during the procedure. Sometimes blood calcium levels can drop during leukapheresis, which can cause numbness and tingling or muscle spasms. This can be treated by replacing the calcium, which may be given by mouth or through an IV.

**Making the CAR T cells...** After the white cells are removed, the T cells are separated, sent to the lab, and altered by adding the gene for the specific chimeric antigen receptor (CAR). This make them CAR T cells. These cells are then grown and multiplied in the lab. It can take several weeks to make the large number of CAR T cells needed for this therapy.

Once the CAR T cells have been made, they will be given back to the patient. A few days before the CAR T-cell infusion, the patient might be given chemotherapy to help lower the number of other immune cells . This give the CAR T cells a better chance to get activated to fight the cancer. The chemotherapy is usually not very strong because CAR T cells work best when there are still some cancer cells to attack. Once the CAR T cells start binding with cancer cells, they start to increase in number and an help destroy even more cancer cells.

**Approved CAR T-cell therapies...** CAR T-cell therapies currently approved include: Kymriah, Yescarta, Tecartus, Breyanzi, Abecma, Carvykti. Many other CAR T-cell therapies are now being studied in clinical trials in the hope of treating other types of cancer as well.

**Possible CAR T-cell therapy side effects...** CAR T-cell therapy can be very effective against some types of hard-to-treat cancers, but it can also sometimes cause serious side effects. Because of this, it needs to be given in a medical center that is specially trained in its use, and patients need to be watched closely for several weeks after getting the CAR T cells.

**Cytokine release syndrome (CRS):** As CAR T cells multiply, they can release large amounts of chemicals called *cyktokines* into the blood, which can ramp up the immune system. Serious side effects can include: High fever and chills, nausea, dizziness, headaches, rapid heartbeat, tiredness and joint pain.

**IMMUNE CHECKPOINT INHIBITORS & SIDE EFFECTS:** Part of the way the immune system is able to tell normal cells from foreign cells. This allows the body to attack foreign cells from normal cells. This is done by using "checkpoint" proteins on immune cells. The checkpoints act like switches that need to be turned on or off to start an immune response. But cancer cells sometimes find ways to use these checkpoints to avoid being attacked by the immune system. Medicines known as monoclonal antibodies can be designed to target these checkpoint proteins. These drugs are called immune checkpoint inhibitors. They don't kill cancer cells directly. They work by helping the immune system to better find and attack the cancer cells. All of these drugs are given as an infusion into a vein.

**PD-1 and PD-L1 inhibitors...** PD-1 is a checkpoint protein on immune cells called *T cells.* It normally acts as a type of "off switch" that helps keep the T cells from attacking other cells in the body. It does this when it attaches to PD-L1, a protein on some cells. When PD-1 binds to PD-L1, it basically tells the T cell to leave the other cell alone. Some cancer cells have large amounts of PD-L1 which helps them hide from an immune attack.

Examples of PD-1 inhibitors include: Keyktrukda, Opdivo, Libtayo. **PD-L1 inhibitors include Tecentriq, Bavencio, Imfinzi**

**CTLA-4 inhibitors...** Another checkpoint protein on some T cells that acts as a type of "off switch" to help keep the immune system in check. Yervoy is a monoclonal antibody that attaches to CTLA-4 and stops it from working. This can help boost the body's immune response. This drug is typically used along with a PD-1 inhibitor, It can be used to treat melanoma of the skin.

**CANCER VACCINES & THEIR SIDE EFFECTS** ...Some cancers are caused by viruses. Vaccines that help protect against infections with these viruses might also help prevent some of these cancers. These include the *human papillomavirus (*HPV).

Cancer treatment vaccines are different from the vaccines that work against viruses. Some cancer treatment vaccines are made up of cancer cells, parts of cells or pure antigens (certain proteins on the cancer cells). Sometimes a patients' own immune cells are removed and exposed to these substances in the lab to create the vaccine. Once the vaccine is ready, it's injected into the body to increase the immune response against cancer cells.

Cancer vaccines cause the immune system to attack cells with one or more specific antigens. Because the immune system has special cells for memory it's hoped that the vaccine might continue to work long after it's given.

**Provenge:** This drug is used to treat advanced prostate cancer that is no longer being helped by hormone therapy. Side effects are usually mild and can include fever, chills, fatigue, joint pain and headache.

**T-VEC:** This vaccine is approved to treat advanced melanoma skin cancer. It is made from a herpes virus that has been altered in the lab to produce a substance that the body normally produces, called a *cytokine.* This cytokine boosts the immune system and can cause flu-like symptoms for a short time.

→

**CYTOKINES AND THEIR SIDE EFFECTS** Cytokines are small proteins that are crucial in controlling the growth and activity of other immune system cells and blood cells. When released, they signal the immune system to do its job. Cytokines affect the growth of all blood calls and other cells that help the body's immune and inflammation responses. They also help to boost anti-cancer activity by sending signals that can help make abnormal cells die and normal cells live longer.

One specific type of cytokine is called a *chemokine.* A chemokine can make immune cells move toward a target. There are different kinds of chemokines, including *interleukins, interferons, tumor necrosis factors, and growth factors.*

Some cytokines can be made in a lab and are used to treat cancer. Some are used to help prevent or manage chemotherapy side effects. They are injected, either under the skin, into a muscle, or into a vein. The most common ones are interleukins and interferons.

**Interleukins** are a group of cytokines that act as chemical signals between white blood cells. Interleukin-2 (IL-2) helps immune system cells grow and divide more quickly. A man-made version of IL-2 is approved to treat advance kidney cancer and metastatic melanoma. IL-2 can be used as a single drug treatment for these cancers, or it can be combined with chemotherapy or with other cytokines such as interferon-alfa.

**Interferons** are chemicals that help the body resist virus infections and cancers. The types of interferon (IFN) are named after the first 3 letters of the Greek alphabet: IFN-alfa, IFN-beta, IFN-gamma. Only IFN -alfa is used to treat cancer. It boosts the ability of curtain immune cells to attack cancer cells. It may also slow the growth of cancer cells directly, as well as the blood vessels that tumors need to grow.

Side effects of interferons can be severe and an make treatment hard to many. Most don't last long.

**IMMUNOMODULATORS AND THEIR SIDE EFFECTS:**

Immunomodulatory are a group of drugs that mainly target the pathways that treat multiple myeloma and a few other cancers. They include **Thalidomide, lenalidomide & pomalidomide.** Theses drugs can also cause severe birth defects if taken during pregnancy.

***Bacillus Calmette-Guerin* (BCG)** is a germ that doesn't cause serious disease in humans, but it does infect human tissues and helps activate the immune system. This makes BCG useful as a form of cancer immunotherapy. BCG was one of the earliest immunotherapies used against cancer and is still being used today. It is used to treat early stage bladder cancer.

**Imiquimod** is a drug that is applied to the skin as a cream. It stimulates a local immune response against skin cancer cells.

**Much is known about the need to protect others from exposure to traditional or standard chemotherapy because it is hazardous. This is why there are safety rules and recommendations for people who handle chemo drugs. To be safe, many experts recommend treating immunotherapy drugs as hazardous and taking the same precautions.**

**It is suggested you cut-out this immunization resume and save for future use & corrections.**

**********

**UPDATE (Wall St. Journal, June 10, 2022) "Cancer Trials Boost Immunotherapies"...**In one small trial, researchers at Memorial Sloan Kettering selected around a dozen patients with rectal cancer for treatment with an immunotherapy made by GSK-based on the rare genetic makeup of their tumors. All of the participants saw their cancers disappear within six months, without surgery, radiation or chemo. *"That's really what you call personalized immunotherapy at its best,"* said director Roy Herbst of the Yale Cancer Center.

Dr. Herbst is a lead researcher on a National Cancer Institute trial that is using genetic sequencing to attempt to match advanced lung-cancer patients with new therapies at some 700 sites across the U.S.

*"I'm curing people now with immunotherapy, but only two out of 10,"* Dr. Herbst said. *"I'm trying to get all 10."* **Immunotherapies have transformed treatment in particular for some advanced cancers—including melanoma, lung cancer and blood cancers.** Despite the progress and investments, immunotherapies have worked inconsistently across cancers and patients. Overall, oncologists estimate that the response rate is around 20%. The drugs can wipe out cancer for some but fail to work for others.

# *NEWSENSE...Tantalizing News!*

**Originated by Columnist Walter Winchell**

**EDITORS NOTE: Walter Winchell began Broadcasting in 1933 to an audience of 25 Million people. The Winchell style was unmistakable. He talked raidly at 197 words per minute...the voice was high-pitched and not pleasant to the ear; but it was distinctive. The staccato quality made every item compelling. He claimed he talked so fast because if he talked more slowly people would find out what he was saying...he began his radio program with a series of dots and dashes operating the key himself. Telegraphers throughout the country complained that what Winchell tapped out made no sense. He realized he hadn't the faintest knowledge of Morse code but he refused to have an experienced telegrapher provide the sound effects for him. He wrote like a man honking in a traffic jam.**

**********

**In 1907,** Dr. Duncan MacDougall determined that a dying patient lost about 21 grams at the time of death (after accounting for other factors like the loss of bodily fluids.) He chalked it up to the weight of the human soul. However, the odd experiment has never been replicated, even though technology for measurements has advanced.

**When you remember a past event,** you are actually remembering the last time you remembered it, not the event itself.

**Nov. 26, 1921...**The alleged danger of dirty money passed frequently from person to person has long furnished a subject for discussion by those who are accustomed to seek unanticipated calamities. There is no reason to believe, as might be expected, if money in circulation were a menace to health that those who handle it most frequently are peculiarly subject to diseases. Bank tellers and other money changers are not demonstrably exposed to unusual chances of infection, although the money which they handle is a medium received from all kinds of persons without regard to the possibility that it may bring on disease. There are scientific reasons why metallic coins may actually be destructive to bacteria, by containing anti-oxidants. *The above was written in 1921 and yet today, many believe that money may be a carrier of diseases!*

***Did you know that*** there is no age discrimination to obtain a Tech Ham license? Chuck Lind, N8CL, our Marco Treasurer's grandson, Warren, age 10 has just joined their *"All-Hams"* family. Anyone know a younger Ham? ***By the way...when did you renew your 10-year license?***

**What procedure should be followed when you want to get immediate attention of a net-controlled station?** A. Begin your transmission with "Priority" or "Emergency" followed by your call sign.

**Who was *"Laughing Gravy?"*** The mongrel was the doggie star of the 1931 Laurel & Hardy short movies who was named after an euphemism for hard liquor during the Prohibition era of 1920 -1933.

*Laughing Gravy* starred in *Pardon Us, Laughing Gravy & the Bohemian Girl.*

The "Top Dog" for Stan & Ollie lived a long happy life, well into WW II. People at the studio spoiled her though, but she did a good job with her beautiful woof woof humor.

**When George Washington became President, in 1789,** a king ruled France, a Holy Roman Emperor ruled much of Europe a Czarina ruled Russia, a Shogun ruled Japan and an emperor ruled China. Of these, only the office of President now remains.

**Influenza** was so named because the cause of the disease was supposedly the evil *"influence"* of the stars. This *"influenza"* was believed also to be the causes of plagues and pestilences.

**The 1st contraceptive diaphragms**—centuries ago—were citrus rinds—half an orange rind, for example.

## SCIENTISTS SAY THEY CAN READ NEARLY THE WHOLE GENOME OF AN IVF-CREATED EMBRYO

**Selecting embryos based on such screening is premature, other researchers warn.....**

A California company says it can decipher almost all the DNA code of a days-old embryo created through in vitro fertilization (IVF)—a challenging feat because of the tiny volume of genetic material available for analysis. The advance depends on fully sequencing both parents' DNA and "reconstructing" an embryo's genome with the help of those data. And the company suggests it could make it possible to forecast risk for common diseases that develop decades down the line. Currently, such genetic risk prediction is being tested in adults, and sometimes offered clinically. The idea of applying it to IVF embryos has generated intense scientific and ethical controversy. But that hasn't stopped the technology from galloping ahead.

Heart conditions, autoimmune diseases, cancer, and many other adult ailments have complex and often mysterious origins, fueled by a mix of genetic and environmental influences. Hundreds of variations in the human genome can collectively raise or lower risk of a particular disease, sometimes by a lot. Predicting a person's chance of a specific illness by blending this genetic variability into what's called a "*polygenic risk score*" remains under study in adults, in part because our understanding of how gene variants come together to arrive or protect against disease remains a work in progress. In embryos it's even harder to prove a risk score's accuracy, "Ultimately, how are we gong to validate this in embryos:" says Norbert Gleicher, an infertility specialist at the Center of Human Reproduction in N.Y. City who was not involved in the research, "We'll have to wait for 40 or 50 years" to find out whether a person develops the disease they were screened for as an embryo.

With current technologies, it's very difficult to accurately sequence a whole genome from just a few cells, though some have tried with different methods. The new work on polygenic risk scores for IVF embryos is "exploratory research," says Premal Shah, CEO of MyOme, the company reporting the results. Today in *Nature Medicine,* the MyOme team, led by company co-founders and scientists Matthew Rabinowitz and Akash Kumar, describe creating such scores by first sequencing the genomes of 10 pairs of parents who had already undergone IVF and had babies. The researchers then used data collect during the IVF process: The couples' embryos, 10 in all, had undergone limited genetic testing at that time, a sort of spot sequencing of cells, called microarray measurements. Such analysis can test for an abnormal number of chromosomes, certain genetic diseases, and rearrangements of large chunks of DNA, and it has become an increasingly common part of IVF treatment in the U.S. By combing the patch embryo data with the more complete parental genome sequences, and applying statistical and population genomics techniques, the researchers could account for the gene shuffling that occurs during reproduction and calculate which chromosomes each parent had passed down to each embryo. In this way they could predict much of that embryo's DNA.

The researchers had a handy way to see whether their reconstruction was accurate: Check the couples' babies. They collected cheek swab samples from the babies and sequenced their full genome, just as they'd done with the parents. They then compared that "true sequence" with the reconstructed genome for the embryo from which the child originated. The comparison revealed, essentially, a match: For a 3-day-old embryo, at least 96% of the reconstructed genome aligned with the inherited gene variant in the corresponding baby; for a 5-day-old embryo, it was at least 98% (because much of the human genome is the same across all people, the researchers focused on the DNA variability that made the parents, and their babies, unique.

"What they presented is a nice method to sequence the genomes of all embryos," says Shai Carmi, a statistical geneticist at the Hebrew University of Jerusalem. Such an accomplishment "is not trivial." Kumar hopes being able to reconstruct most of an embryo's genome will provide information well beyond what's now available to people undergoing IVF, to determine an offspring's chances of staying healthy. "It's not enough to focus on the single gene anymore," he says.

Once they had reconstructed embryo genomes in hand, the researchers turned to published data from large genomic studies of adults with or without common chronic diseases and the polygenic risk score models that were derived from that information. Then, MyOme applied those models to the embryos, crunching polygenic risk scores for 12 diseases, including breast cancer, coronary artery disease, and type 2 diabetes. The team also experimented with combining the reconstructed embryo sequence of single genes, such as BRCA1 and BRCA2, that are known to dramatically raise risk of certain diseases, with an embryo's polygenic risk scores for that condition—in this case, breast cancer.

We're talking about providing information on risks that people care about—heart disease, cancer, autoimmune disease," says Kumar, who is also a pediatric medical geneticist. He still sees patients and sometimes encounters frustration from parents wanting to avoid conferring a high risk of ailment that run in their families to their offspring. At the same time, Kumar stresses, "This is a new technology, It's going to have controversies and challenges.

In fact, many researchers say it's premature to use polygenic risk scores to select which embryos are transferred. Such risk scores are "primarily still a research tool, even in adults," says Barbara Koenig, a medical anthropologist who works on bioethics at the University of California, San Francisco. She's involved in a large study called Women Informed to Screen Depending On Measure of Risk that offers some women polygenic risk scores for breast cancer along with screening recommendations. ""The scores are constantly being refined, every week they change," Koenig says. "It's like a constantly moving target."

Kumar and his co-authors acknowledge the scores' limitations, including that they are based on DNA from populations of overwhelmingly European ancestry and may be less accurate in other groups. Because of that, the MyOme team did not create disease risk assessments for embryos whose genome reflected at least 20% Asian or African ancestry. Even the DNA array technologies used to reconstruct the embryonic genomes have a European bias, says Genevieve Wojcik, a genetic epidemiologist at John Hopkins, and may be less reliable for those with non-European ancestry. "You have a tool that cannot be used for a large proportion of the population," she says. Kumar says the company is working to make the technology more broadly applicable.

There are other concerns, too. Although Carmi says the accuracy of polygenic risk scores in adults has improved, it's unknown whether scores based on adult DNA and health data translate to embryos, in part because the environment can play a major role in shaping outcomes. "It's difficult to say whether this will be meaningful," Carmi says. He and his colleagues have seen this limitation up close: They've used computer modeling to assess whether height and IQ can be boosted by selecting embryos using polygenic risk scores for either trait, and found that generally, it doesn't work. "We're still missing a lot" when it come to understanding genetics, even for highly heritable traits such as height, he says. In another computer modeling paper, however, Carmi found certain disease polygenic risk scores in embryos may prove useful. That's because unlike height which runs across a spectrum, heart attacks, say, either happen or they don't And pulling down genetic risk somewhat by implanting a different embryo, he says, may be enough to avoid that outcome.

But like a painting with only one corner visible, much of the human genome remains shrouded, including how genes interact with each other and the multiple effects one gene may have. Gleicher worries about the unintended consequences of applying risk scores to embryos. "You can achieve omission of one disease but at the same time, by doing that, induce another disease." For example, modeling suggests selecting an embryo with a high polygenic risk score for educational attainment could also increase it risk for bipolar disorder. In Dec. 2021, the European Society of Human Genetics urged against using polygenic risk scores for embryo selection—a position firmly endorsed by Gleicher, who calls such practice "unethical."

Still some companies and fertility clinics already claim they can help parents select embryos for IQ and risk of various diseases. MyOme, meanwhile, is applying the methods from this latest study to another that's ongoing, working with IVF clinics and couples who want to learn polygenic risk scores for their frozen embryos. Couples may opt to decide which embryos to implant based on that information. Kumar says "Our focus is doing this research because we see promise."

**(Information for above was taken from Jennifer Couzin-Frankel's fine article that appeared in *Nature Medicine, 28, 513-516, 2022*)**

## WILL CRYONICALLY FROZEN BODIES EVER BE BROUGHT BACK TO LIFE?

That optimism is 100% not possible today. But based on stories of resurrections and immortality indicating that some scientists are betting on a possible future for a second life after a deep freeze.

Dennis Kowalski, the president of the Cryonics Institute, a non-profit, based in Michigan and one of a handful of companies worldwide offering its line of services is optimistic. He sites modern life-saving cardiac defibrillation and CPR as examples of how science can drastically advance.

Based on that premise—that someday, science will find solutions to biological damage that's irreparable by today's standards—the aim of cryonics is to keep bodies in a stable, preserved state until the necessary medial technology arrives. Kowalski describes it as "*an ambulance ride to a future hospital that may or may not exist.*"

**The procedure:** The aim of cryonics is to keep bodies in a stable preserved state until the necessary medical technology arrives.

When someone who's made arrangements to have their remains cryonically preserved is declared dead, a medical team cools the body with ice water and keeps the body's tissues oxygenated using CPR and oxygen masks. The ice cold body is put in a hermetically sealed container and flown to the cryonics facility.

There, the team puts the body on a machine similar to a heart-lung bypass, circulating the blood and maintaining oxygenation. They pump in a vitrification solution that works like antifreeze to keep the body's tissues from turning to ice crystals, in hopes of minimizing structural damage. Then, they slowly cool the body to minus 320 degrees F in a liquid nitrogen vapor chamber. Once its cold enough, the body is transferred to a Thermos-like tank of liquid nitrogen, where it'll stay for the foreseeable future. The bodies will wait in these tanks until medical technology is and if able to revive them.

Kowalski says there are three challenges for this future tech to overcome: *It'll need to repair the damage done by freezing, cure whatever* ailments originally killed the subject, and reverse the aging process so that the subject has a young healthy body to enjoy in their second go-round.

The basic problem is there is no current way, no proven scientific way to actually freeze a whole human down to that temperature without obliterating the tissue.

Cryonocists like Kowalski are well aware of criticisms like these. He argues that while these problems are insurmountable to us today, they may well be solvable in the future. In other words, "*You have nothing to lose, and everything to gain.*

**(Information for above was taken from Kate Golembiewski's fine article in the Discover Science magazine, April 2022.)**


## MONKEYPOX

**(As presented on MARCO Grand Rounds, *June 12, 2022.*)**

Monkeypox is a relatively benign disease found primarily in West and Central Africa. The virus until recently was rarely detected outside of Africa where it is endemic. It now has affected 1,050 people in more than 40 countries with no deaths reported.

Cases are concentrated in Europe, with the highest numbers in the U.K., Spain ad Portugal. The U.S. had documented 31 cases across 12 states and the District of Columbia, according to the CDC. Cases have also been reported in Canada, Mexico, Australia, Israel, U.K. and the United Arab Emirates.

Monkeypox is thought to spread mainly through contact with the rash caused by the virus. The can happen via bodily contact or by contact with materials used by people infected with the virus.

Use of masks is not recommended except for those at high risk of contracting monkeypox. That includes people who share a living space with others infected with monkeypox and healthcare workers and others who may be in close contact with confirmed cases.

**********

## "DOOMDAY" SEED VAULT STORES 500,000 CROPS

A mold-resistant bean, a German pink tomato and a wild strawberry plucked from the flanks of a Russian volcano are just some of the crops whose seeds are being tucked away recently in a giant vault dug out of a mountainside of the Norwegian island Svalbard.

With these new deposits, the so-called Svalbard "*Doomsday*" Global Seed Vault will reach its half-million mark of seed varieties. The giant icebox of sorts, which was officially opened on Feb. 26, 2008, is meant to protect the world's crop diversity from natural or manmade disasters.

Reaching the half million mark brings mixed emotions, because while it shows that the vault at Svalbard is now the gold standard for diversity, it comes at a time when our agriculture systems are really sitting on a knife's edge," said the director of the Global Crop Diversity Trust, which partners with the Norwegian government and the Nordic Genetic Resource Center in Sweden in operating the vault.

The vault is dug into the Plataberget mountain, which means "*plateau mountain*," and is located near the village of Longyearbyen, Svalbard—a group of islands north of mainland Norway. The arctic permafrost offers natural freezing for the seeds, while additional cooling brings the temperature down to minus .4 degrees F.

The preciousness of such seeds is reflected in the inaccessible nature of the vault. "Anyone seeking access to the seeds themselves will have to pass through four locked doors; the heavy steel entrance doors, a second door approximately 115 meters down the tunnel and finally the two keyed air-locked doors," Keys are coded to allow access to different levels of the facility.

Like all seeds coming to the vault, the new ones are duplicates of those from other collections. Material directly acquired by plant breeders to develop disease-resistant and "climate-ready crops, and to meet the challenge of rapidly growing populations is maintained by genebanks, not the seed vault.

Recent new seeds shipped to the doomsday vault include semi-dwarf wheat and rice from the early 1960s: disease-resistant soybeans; and the German pink tomato, a hardy sweet-flavored tomato transported to Iowa in 1883 by a Bavarian immigrant.

The dangers arise from possible future atmospheric toxins both natural and man-made. *"We're seeing in several of the soybean varieties intriguing traits that could allow farmers to confront such problems as drought or extreme heat, shorter or longer growing seasons, or higher levels of CO2,"* said the curator at the U.S. Dept. of Agriculture, National Center for Genetic Resources Preservation.

**********

**A New Yorker** was so sure his wife was cheating on him that he insisted they move to California. A week later, he discovered they had the same mailman.

LIGHTEN UP...


4 **Winston Churchill's *paraprosdokians" include:*** Where there is a will I want to be in it. **The last thing I want to do is hurt you, but it's still on my list.** If I agreed with you, we'd both be wrong. **War does not determine who is right—only who is left.** They begin the evening news with "*Good evening,"* then proceed to tell you why it isn't! **Behind every successful man is his woman. Behind the fall of a successful man is usually another woman.** You don't need a parachute to skydive. You only need a parachute to skydive twice. **You are never to old to learn something stupid.** To be sure you hit the target, shoot first and then-call whatever you hit the target. **Going to church doesn't make you a Christian any more than standing in a garage makes you a car.**

**********

**Things to ponder...**The inventor of the treadmill died at the age of 54. The inventor of gymnastics died at age of 57. The world bodybuilding champion died at the age of 41. The best soccer player in the world, Maradona, *died at the age of 60.* And then...KF|C inventor died at 94. Cigarette maker Winston died at 102. The discoverer of opium died at 115.—in an earthquake. Hennessy Cognac, Irish inventor died at 96. How did doctors come to the conclusion that exercise prolongs life? The rabbit is always jumping but it lives to only 2 years. The turtle that doesn't exercise at all lives 200 years.

**********

**"I hurt all over!"** A young redhead goes into the doctor's office and says *that her body hurts wherever she touches it.* **"Impossible,"** says the doctor, **"show me."** She takes her finger and pushes her elbow and screams in agony. She pushes her knee and screams, pushes her ankle and screams, everywhere she touches make her scream. The doctor says, **"You're not really a red head are you?** "No," she replies, "I'm actually a blonde." **"I thought so,"** the doctor says, **"Your finger is broken."**

**********

"IN PRISON"...you spend most of your life looking through bars from inside wanting to get out. At work, you spend most of your time waiting

**********

**NEVER** accept a drink from a urologist!

The best way to approach a woman with a past is a present!

**********

**At the Olympics, a man went up to a competitor who was carrying a very long pole. "Are you a pole vaulter?" *"No, I'm German, but how did you know my name is Walter?"***

**********

**Marriage changes passion. Suddenly you are in bed with a relative!**

**********

**FIFTEEN DAYS AGO I read that smoking can kill you. The following day, I stopped smoking. Eight days ago, I read that drinking can kill you. The next day, I stopped drinking. Yesterday I read that having sex can kill you. This morning I gave up reading!!**

**A MAN WAS WALKING HOME** late at night when he sees a woman in the shadows. "*Twenty bucks*," she says, He'd never been with a hooker before, but he decides– it's only twenty bucks! A few minutes later a police officer shines his flashlight on them. "*What's going on here folks*," asks the police officer, "*I'm making love to my wife*," the man answers indignantly. "*Oh, I'm sorry," says the cop*, "*I didn't know*." "*Well*" says the man, "neither did I until you shined that light in her face."

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## MEDISHARE UPDATE

Arnold Kalan, WB6OJB


**The charitable arm of MARCO is alive despite the pandemic. We are looking for donations, big or small, to fund our next project.**

**Projects in the past have offered assistance with organizations that are in need of a means of communications for medical clinics in mostly third world countries. All donations are completely tax deductible and you will receive a note of thanks together with some wonderful MARCO seals that look very nice on QSL cards.**

## ORAL DIABETIC DRUGS
## For a Progressive Type II Diabetic disease.

**Oral diabetes medicines help control blood glucose levels in people whose bodies still produce some insulin. They include: Glipizide** *(Glucotrol, Glucotrol XL),* **Glimepride (Amaryl), Glyburide** *(DiaBeta, Glynase Pres Tabs), Micronase.* **Metformin** *((Glucophage, Glucophage XR, Glumetza, Fortamet, Riomet)* **Piogilitozone** *(Actos), rosigitozone, (Avandia).* **Acarboase** *(Precose) Glyset).*

**Many oral diabetes medications may be used in combination with each other or with insulin to achieve the best blood glucose control. TYPES:**

**SULFONYLUREAS (Glipizide** *(Glucotrol, Glucotrol XL0* **Glimepride** *(Amaryl),* **Glyburide** *(DiaBeta, Glynase PresTab, Micronase).* Insulin eventually depleted with use.

These medications lower blood glucose by causing the pancreas to release more insulin. Eventually the insulin supply deteriorates.

**BIGUANIDES, Metformin** *(Glucophage, Glucophage XR, Glumetza, Fortamet, Riomet. Eventually insulin depleted with use.*

These medications reduce how much glucose the liver produces. It also improves how insulin works in the body, and slows down the conversion of carbohydrates into sugar.

**ALPHA-GLUCOSIDASE INHIBITORS, Acarbose** *(Precose),* **Miglitol** *(Glyset), repaglinide & gliclazide—safe as Metformin.*

These medications work by delaying the breakdown of carbohydrates and reducing glucose absorption in the small intestine. Also blocks certain enzymes to slow down absorption of some starches. 35% decrease in CV disease.—causes stomach upset however.

**THIAZOLIDINEDIONES, Pioglitozone** *(Actos),* ***rosiglitazone*** *(Avandia).*

These medications improve the way insulin works in the body by allowing more glucose to enter into muscles, fat, and the liver.

**MEGLITINIDE, Repaglinide** *(Prandin),* **nateglinide** *(Starlix).*

*These medications* lower blood glucose by releasing more insulin.

**DPP-4 INHIBITORS, Sitagliptin** *(Januvia)(available as combo with Metformin).* **Saxagliptin** *(Onglyza),* **linagliptin** *(Tradjenta),* **alogliptin** *(Nesina)...Also known as GLiptins*

These medications help your pancreas to release more insulin after meals. They also lower the amount of glucose released by the liver.

**SGLT2 INHIBITORS, Caagliflozin** *(Invokana),* **dapagliflozin** *(Farxiga),* **empagliflozin** *(Jardiance).*

These drugs work on the kidneys to remove extra sugar from the body.

**BILE ACID SEQUESTRANTS, Colesevelam** *(Welchol)*

Bile acid sequestrants lower cholesterol and blood sugar levels in patients who have diabetes.

**DOPAMINE AGONISTS, Bromocriptine** *(Cyclocet).*

This medication lowers the amount of glucose released by the liver.

### KEY ISSUES

A repaglinide *(Prandin)* and metformin *(Glucophage)* combination tablet is indicated as an adjunct to diet and exercise to improve glycemic control in adults with Type 2 diabetes mellitus who are already treated with a medlitinide and metformin or who have inadequate glycemic control on a meglitinide alone or metformin alone.

Repaglinide, an insulin secretagg, and metformin, an insulin sensitizer, targets two different pathophysiological mechanisms underlying Type 2 diabetes, reduced insulin secretion and insulin resistance.

The combination of repaglinide and metformin provides comprehensive glycemic control, as well as a stable weight profile and fewer hypoglycemic episodes.

The single-tablet combination of repaglinide and metformin is safe and well tolerated and offers enhanced dosing convenience and therapy increased patient adherence.

Other combinations include: (28 in all) Metformin & glipizide (Metaglip);
Roislitazone & glimepiride (Avandaryl);Pioglitazone & metformin (ACTOplus Met); Metformin & glyburide (Glucovance); Rosiglitazone & metformin (Avandamet); Pioglitazone & glimepiride (duetact)

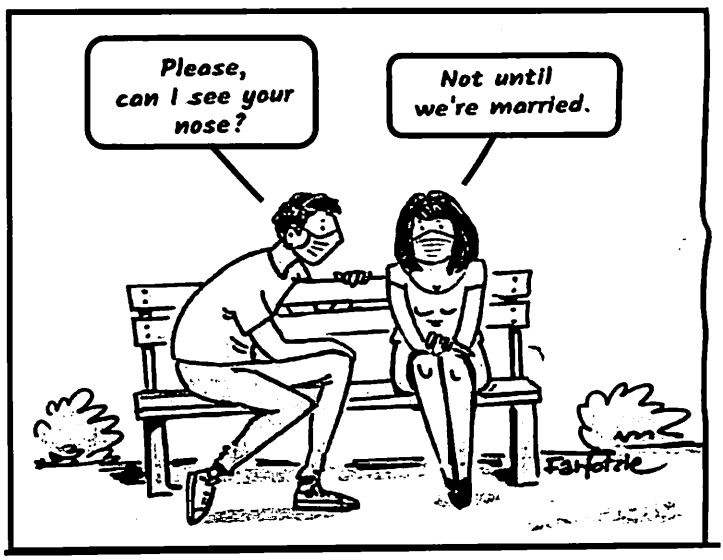
## SHOULD PATIENTS TAKE ASPIRIN FOR CV PREVENTION? UPDATED RECOMMENDATIONS.....

**The US Preventive Services Task Force (USPSTF), JAMA April 26, 2022.**

**The ACC/AHA recommends that low-dose aspirin use (75-100 mg/d) might be considered for the primary prevention of atherosclerotic CVD among select adults aged 40 to 70 years at higher CVD risk but not at increased risk of bleeding. Low-dose aspirin use is not recommended on a routine basis for primary/prevention of CVD in adults older than 70 or among adults of any age who are at increased risk of bleeding.**

The USPSTF issued its first Guide to Clinical Preventive Series in 1989. That initial monograph included a recommendation to "*consider*" aspirin prophylaxis for primary CV prevention in men 40 years or older with coronary risk factors and low bleeding risk. The sole basis for that recommendation was 2 randomized trials in which study participants were exclusively male physicians.

Since then, the USPSTF has updated its position on aspirin for primary prevention on multiple occasions, and the trajectory has been tortuous. In 1996, after further deliberation, they reconsidered the evidence and concluded that the balance of harms and benefit was too close to justify a general recommendation. But in 2002, after publication of 3 more trials with more representative study populations, the taskforce recommended strongly that clinicians discuss aspirin chemoprevention with people at increased risk for coronary disease and suggested that decisions be informed by risk calculators and tables with estimate benefits and harms. *(For further details see page 1552 JAMA April 26, ) 2022. )* **********




### ELECTRICITY

*Q. Who invented the word "electricity?" A.* Dr. William Gilbert—who became physician to Queen Elizabeth in 1601. Dr. Gilbert gave the name **"electric"** to static electricity produced by rubbing a piece of **amber** with a cloth. He derived the name from *electron,* the Greek word for amber.

**********

### MOHS SURGERY

Mohs surgery is considered the most effective technique for treating dermal basal cell and squamous cell carcinomas.

In 1933, 23-year-old Frederic Mohs was a research assistant assigned to inject different chemicals into cancerous rat tissues to produce specific reactions. He discovered that one of these chemicals, a zinc chloride solution with stibnite and sanguinaria Canadensis to develop a cohesive paste. When he applied the paste, Mohs found that he could excise the tissue without causing bleeding. He could then prepare frozen sections of the excised tissue, and placed them on slides to be seen under the microscope.

In 1936, after training as a surgeon, Dr. Mohs began performing the procedure, initially dubbed "chemosurgery" *(chemo referring to the zinc chloride paste),* on human skin cancer patients. It was a scrupulous process that could take days, cutting, viewing margins, cutting again etc.

Currently, Mohs surgery is indicated for basal and squamous cell lesions and multiple studies have confirmed its superiority over wide-section removal. The use of ZnCl paste has all but discontinued.

## CME RANKINGS, JULY 6, 2022
## BOB CURRIER GRAND ROUNDS OF THE AIR
14.342 Mhz, 11 a.m. Eastern, One hour credit Category I CME

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|---|---|---|---|
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| NU4DO | 22 | Norman | Largo, FL |
| N6DMV | 22 | Paul | Torrance, CA |
| KD4GU | 22 | Warren | Largo, FL |
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| WB6OJB | 20 | Arnold | Pac. Palisades, CA |
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| KNOS | 19 | Dave | Virginia |
| N5AN | 19 | Bud | Lafayette, LA |
| KD5BQK | 19 | Linda | El Paso, TX |
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| N6NYJ | 17 | Art | Beverly Hills, CA |
| N2OJD | 16 | Mark | Sidney, Ohio |
| N3IM | 16 | Keith | Millhouse, PA |
| KE5SZA | 16 | Bill | Danville, IL |
| N4MKT | 16 | Larry | The Villages, FL |
| NM2K | 16 | Dianne | Buffalo, NY |
| W4DAN | 15 | Danny | Cleveland, TN. |
| KD4IZ | 15 | Jack | Maryland |
| W8ING | 15 | Bob | Hazard, KY |
| KK1Y | 14 | Art | Seminole, FL |
| WA3QWA | 14 | Mark | Chesapeake, VA |
| WB9EDP | 13 | Harry | Batavia, IL |
| KE8GA | 13 | George | North Carolina |
| W1RDJ | 12 | Mark | Cape Cod |
| KEOPIE | 12 | Trina | Boulder, CO |
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| W1EXE | 11 | Mark | Cape Cod |
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| W6GZ | 8 | Bill | Hysteria, CA |
| KC9ARN | 7 | Micheline | Batavia, NY |
| K3\K | 6 | Ian | Pennsylvania |
| N9GOC | 5 | Pat | Wisconsin |
| AA4BX | 4 | Mary | Myrtle Beach, SC |
| AA4FL | 4 | Jay | Hawthorne, FL |
| N9GJ | 4 | Greg | Tennessee (?) |

(ANY CORRECTIONS?)

*(Above represents those audible at Base Station 4 or more times between January and July 6, 2022.)*

**********

| YEAR | TOTAL CHECK-INS | AVERAGE PER SUNDAY |
|---|---|---|
| 1998 | 694 | 14.46 |
| 1999 | 766 | 15.95 |
| 2000 | 1,035 | 20.29 |
| 2001 | 1,153 | 22.60 |
| 2002 | 1,383 | 26.15 |
| 2003 | 1,489 | 28.63 |
| 2004 | 1,534 | 29.50 |
| 2005 | 1,517 | 29.17 |
| 2006 | 1,531 (one extra Sunday) | 28.89 |
| 2007 | 1,591 (one extra Sunday) | 30..02 |
| 2008 | 1,524 (only 46 nets) | 33.14 |
| 2009 | 1,533 (46 Nets) | 33.32 |
| 2010 | 1,591 (44 nets) | 36.22 |
| 2011 | 1,514 (44 nets) | 34.41 |
| 2012 | 1,602 (44 nets) | 36.41 |
| 2013* | 1,400 (44 nets, new freq.) | 31.82 |
| 2014 (Year of the terrorist | 1,756 nets | 37.36 |
| 2015 | 1,722 (49 nets) | 35.14 |
| 2016 | 1,687 (46 nets) | 36.67 |
| 2017 | 1,536 (46 nets) | 34.13 |
| 2018 | 1.500 (43 nets) | 34.88 |
| 2019 | 1,786 (49 nets) | 35.90 |
| 2020 | 2.187 (45 nets) | 48.60 |
| 2021 | pandemic (42 nets) | |
| 2022 | 917 (24 nets ) | 38.21 |

## RADIATING DEATH

In 1915, Sabin von Sochocky, a keen amateur painter, developed a paint that glowed in the dark, thanks to its special ingredient, radium, a brilliant while, highly radioactive substance discovered in 1898. Appropriately enough Sochocky called his paint "Undark." He went on to set up the US Radium Corp. to paint glowing numerals on wristwatch dials and crucifixes .

The raze for glow-in-the-dark objects took off and soon Sochocky was employing hundreds of women and young girls to paint radium onto watch dials as well a luminous instrument dials for the US Army .

At a factory in New Jersey, women and girls as young as 12 sat at rows of work-benches, tapering their radium drenched brushes with their lips to ensure a fine luminous line on dials. Their managers encouraged them telling them that radium would make them sexually attractive and improve their complexions. This was no cruel deception. Radium at this time was considered by many doctors to be a cure-all for anything from waning sex drive to high blood pressure to debutantes fatigue. No one believed that radium paints could cause cancer although exposure to radiation from radium was known to destroy cells.

In 1924, however, New York dentist Theodore Blum noticed that one of his patients, who worked for US Radium, had a severe jaw infection He wrote an article about her in the Journal of the American Dental Association remarking it in a footnote that the infection was caused by a radioactive substance. This sparked a number of investigations one of which found that the hair, faces, hands, arms, necks….even the corsets of the dial painters were luminous. Dial painters began to suffer appalling cancers of the jaw, the US Radium Corporation maintained that this was due to poor dental hygiene..

In 1927, five former US Radium dial painters, now suffering from crippling bone diseases filed a law suit against the company. Two of them were so ill they had to be carried to the court room, one was unable even to raise her right hand to take the oath. US Radium insisted that the women's injuries were not by radium . The case promised to drag on for years, until a sudden out-of-court settlement of $10,000 was awarded in 1928 to each of the women, plus medical expenses for as long as they suffered from radium poisoning. The true light was finally exposed.

**********

**The average lead pencil can be sharpened 17 times and is capable of drawing a 35-mile straight line.**

**********

## MAIL BOX

From **Chuck Lind N8CL** in regards to "*Little Warren,"* his 10-year old Tech Ham grandson: "*Little Warren is still a rather small person, but into math and ham radio with the help of his father, David K2DW. I'll try to get a picture of all these culprits and send it along….We are in Niskayuna (N.Y.) at little Warren's house.* (I replied as from "*BIG Warren* who met him earlier at Marco in Myrtle Beach.)

From **Jeff Wolf K6JW,** in regards to confusion on the MARCO Grand Rounds...I've had this discussion before with Net Control, Arnold WB9EDP, Paul N5DMV and Art (W6NYJ) but they simply ignore me. They continue to announce themselves without any pause and when I submit I can't tell if my ident was heard!

Anyway what I will do now is NOT call in unless I can follow them—by then they'll likely either have given up entirely or gone to the internet. In either case, I should then be able to hear you acknowledge me. *Sounds good, let's try it.*

From **Dave Justis KNOS, "***Our heat index hit 105 here today (*in Virginia) *so an extra 16 oz of sweat shed...such is life!"*

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**The blind girl...**There was a blind girl who hated herself because she was blind. She hated everyone except her loving boyfriend. He was always there for her. She told her boyfriend '*If I could only see the world I would marry you!* One day someone donated a pair of eyes to her. When the bandages came off she was able to see everything., including her boyfriend. He asked, "*Now that you can see the world will you marry me?* The girl looked at her boyfriend and saw that he was blind. The site of his closed eyes shocked her...she hadn't expected that. Her boyfriend left in tears and days later wrote, "Take good care of your eyes, my dear, for before they were yours they were mine!

## PRESIDENT'S COLUMN:

Bernie Krosowski, KD5QHV

**Greetings Marconians!**

*I've been working on my big antenna and will not be very strong on the net. I'll probably be listening but may not be able to be heard.*

*Pass on my greetings to all and a HAPPY 4th of July!!*

*Be safe my friends!*

**Bernie is a retired hi-time Corporate Pilot, ham, and husband of our previous President Linda Krasowski. We are fortunate to have him for a leader. He is planning on a periodic run-down on the ups and downs of medicine and radio and promises to keep the ball rolling with MARCO!**

**********

## THE FIRST BROADCASTING STATION—KDKA, PITTSBURGH

The chief contender to the title of *"First full-service broadcasting station* is KDKA Pittsburgh.

KDKA owes its origin to an advertisement placed in the *Pittsburgh Sun* by the Joseph Horne Dept. store on 29 Sept. 1920. Headed "Air Concert Picked up by Radio Here," it described how programs broadcast by Dr. Frank Conrad's amateur station KXK could be heard "on the wireless receiving station which was recently installed here for patrons interested in wireless experiments." Similar receivers, stated the advertisement, were on sale now in the West Basement at prices of $10 upwards.

Amateur Dr. Conrad was a radio engineer employed by the Westinghouse Co., whose V.P., H. P. Davis, was among those who saw the Joseph Horne advertisement. The next day Davis suggested that Westinghouse should erect a station at East Pittsburgh and operate it on a daily schedule so that people would acquire the habit of listening to it as they *do when reading a newspaper.*

The station was licensed by the Dept. of Commerce and assigned the call letters KDKA on 27 Oct. 1920. Westinghouse had already begun manufacturing a special home receiver which was produced in sufficient quantity to ensure that everyone who wanted one would be able to listen in to the opening broadcast on 2 November. These can reasonably be regarded as the first sets designed solely for listening to broadcasts rather then conducting radio experiments.

At the time KDKA came on the air under the direction of Frank Conrad, Detroit's 8MK was still being run as an amateur experimental station personally financed by William Scripps, publisher of the *Detroit News.* It was not owned by the newspaper, and despite De Forest's generous tribute, it was not at this stage in any sense commercially operated. KDKA's claim to priority, as the earliest non-experimental broadcasting station, is based on the fact that it was founded as a commercial enterprise whose only object would be to provide a programmed service. Sufficiently entertaining and informative to induce prospective listeners to buy radio sets. In this important respect it differed from all previous broadcasting stations, whose interest had been primarily in the technical development of radio. Detroit referred to its listeners as "radio operators," seeing them as fellow experimenters; Westinghouse aimed to reach the family circle rather than simply the radio ham.

The first radio broadcast commercial was a 10 minute talk on Hawthorne Hall, a new co-operative apartment house at Jackson Heights, N.Y., transmitted by Station WEAF New York on behalf of the Queensboro Corp. The sponsor paid $500 for five successive daily spots and was last able to report that two apartments had been sold in response to the advertisement. WEAF's service was described by the owners of the station, A.T.&T., as "toll broadcasting." The station itself provided no programed material at all, but anyone could come in and give his or her message to the world, commercial or otherwise, or demonstrate his own particular talents, for a set fee of so much minute air time. Other early sponsors to broadcast commercials on WEAF during 1922 were Tidewater Oil, American Express, Macy's, Metropolitan Life, Colgate' and I. Miller Shoes.

Dutch Saint Martin
(site of recent MARCO DXpedition.

The first distress signal was transmitted from the East Goodwin Lightship on 17 March 1899 when the merchant vessel *Elbe* ran aground on the Goodwin Sands. The message was received by the radio operator on duty at the South Foreland Lighthouse, who was able to summon the aid of the Ramsgate lifeboat. The East Goodwin Lightship became the first vessel to send a radio signal of its own distress on 28 April 1899, when it ws rammed by the *SS R. F. Mathews.*

Prior to the introduction of SOS, the recognized call sign for ships in distress was CQD. The signal, devised by the Marconi Co. and effective from 1 Feb. 1904 was intended to mean "*All Stations—Urgent,*" but was popularly misinterpreted as "*Come quick—danger.*" SOS was established as an international distress signal by an agreement made between the British Marconi Society and the German Telefunk organization at the Berlin Radio Conference, 3 Oct. 1906. It was formally introduced on 1 July 1908.

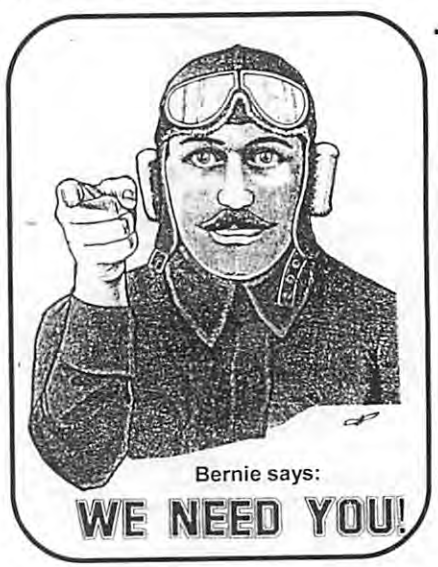
The first occasion on which the SOS signal was transmitted in an emergency occurred on 10 June 1909, when the Cunard liner *SS Slavonia* was wrecked off the Azores. Two steamers received her signals and went to the rescue.

The first radio, military was employed by the British Army during the South African War of 1899-1902.

The first radio-telephone sets used in warfare was issued to German forces on the Western Front in 1917.

The first *Walkie Talkie* was produced at the US Signal Corps Engineering lab at Fort Monmouth, N.J. in 1933.

The first public *radio-telephone* available to subscribers was inaugurated between Long Beach, CA and Avalon, Santa Catalina Island, off the California mainland, on 16 July, 1920. The distance was 30 miles, and Avalon subscribers could be connected to callers anywhere else in the USA via the land lines that terminated at Long Beach.




**BIRDS OF A FEATHER FLOCK TOGETHER...**

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**Send a Gift Membership To your HAM buddy**

*****

**Make sure he is either a doctor or a patient and that includes any radio enthusiast who is vulnerable who likes radio and not sickness!**

## LYME DISEASE

**(As presented on MARCO Grand Rounds of the Air, June 5, 2022)**
**Lyme Disease is a tick-transmitted infection caused by Borrelia burgdorferi. Symptoms include an erythema migrans rash, which may be followed weeks to months later by neurologic, cardiac, or joint abnormalities. Diagnosis is primarily clinical, but acute and convalescent antibody titers may be helpful. Treatment is with antibiotics such as doxycycline or, for serious infections, ceftriaxone.**

Lyme disease was recognized in 1975 because of close clustering of cases in Lyme, Ct. and is now the most commonly reported tick-borne illness in the U.S. It has been reported in 49 states, but mostly in Massachusetts to Maryland, in Wisconsin, Minnesota, California and Oregon. Lyme also occurs in Europe, across Russia and in China and Japan. Onset is usually in the summer and early fall. Most patients are children and young adults living in heavily wooded areas.

Lyme is transmitted primarily by Ixodes scapularis, the deer tick. In the U.S., the white-footed mouse is the primary animal reservoir and the preferred host for nymphal and larval forms of the deer tick. Deer are hosts of adult ticks but do not carry Borrelia.

**Symptoms & Signs...**Lyme has 3 stages, early localized, early disseminated, and late. The early and late stages are usually separated by an asymptomatic interval.

Erythema migrans (EM), the hallmark and best clinical indicator of Lyme, is the sign of the disease. It occurs in about 75% of patients, beginning as a red macule or papule between 3 and 32 days after a tick bite. The area expands, often with central clearing, to a diameter up to 50 cm. Soon after onset nearly 1/2 of untreated patients develop multiple, usually smaller, lesions without indurated centers. EM generally lasts a few weeks (average, 3 to 4 wks.) Evanescent lesions may appear during resolution.

Symptoms of early disseminated disease begin days or weeks after the appearance of the *primary lesion* when the bacteria spread through the body. This musculoskeletal, flu-like syndrome, consisting of malaise, fatigue, chills, fever, headache, stiff neck, myalgia's, and arthralgia's, may last for weeks. Because symptoms are often nonspecific, the diagnosis is frequently missed; a high index of suspicion is required. Symptoms are characteristically intermittent and changing, but malaise and fatigue may linger for weeks. Some patients develop symptoms of fibromyalgia.

*Neurological* abnormalities develop in about 15% of patients within weeks to months of EM generally before arthritis occurs), commonly last months, and usually resolve completely. Most common are lymphocytic meningitis, especially Bell's palsy, which may be bilateral, and sensory or motor radiculo-neuropathies, alone or in combination.

Heart abnormalities occur in about 8% within weeks of EM. They include fluctuating degrees of atrioventricular block and rarely, myopericardtis with chest pain, reduced ejection fraction and cardiomegaly.

In untreated Lyme, the late stage begins months to years after initial infection. Arthritis develops in about 60% f patients within several months (up to 2 yrs.) of disease onset. Intermittent swelling and pain in a few large joints, especially the knees, typically recur for several years. Affected knees commonly are much more swollen than painful; they are often hot, but rarely red. Baker cysts may form and rupture. Malaise, fatigue, and low-grade fever may precede or accompany arthritis attacks.

**Diagnosis:** Cultures of blood and body fluids may be obtained. Acute and convalescent antibody titers may be helpful, positive enzyme-linked assay (ELISA) titers should be confirmed by Western blot. However, seroconversion may be late ( 4 weeks) or occasionally absent, and positive IgG titers may represent previous infection. PCR testing of CSF or synovial fluid is often positive when those sites are involved. A classic EM rash strongly suggest Lyme, particularly when supported by other elements.

**Treatment: Early...**Amoxicillin 500 mg tid po for 10-21 days; Doxycycline, 100 mg po bid for 10-21 days. Cefuroxine 500 mgm po bid for 10-21 days; Azithromycin, 500 mg po once/day for 7 days.

**Prevention:** A single dose of doxycycline 200 mg po has been shown to reduce the likelihood of Lyme after deer tick bite, A vaccine, which was only moderately effective, has been removed from the market.

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**Word from the UKRAINE (Dec. 10, 2010) President Bernie KD5QHV had an amp for sale and one of the possible byers was old-time MARCO member Dr. Alex Gavva. Alex wrote** *I joined MARCO in 1990, it was a great depression here. We had no money to buy drugs & equipment for our hospital and in 1997 Marco organized $40,000 humanitarian aid for us. After 2000 life here improved but I always remember this help, please relay to Linda & the group..ALEX !*

## MARCO NETS

**Weekly MARCO Medical Grand Rounds Net: Sundays, 14.342 MHz, 1500 UTC** (Summer), **1600 UTC** (Winter), net controller Warren KD4GUA.

**Weekly DV Net: (Digital Voice), Saturdays at 1500 UTC.** We have chosen to use the QuadNet Array, an IRC, or internet Chat Facility that acts like a universal translator between difference digital modes and allows hams who identify by call sign to connect with other users of digital radios world-wide through interconnected reflectors and talk-groups. See their website for more details, including how to connect within the https://www.openquad.net/webpage. Net Controller Jay AA4FL

**Special COVID-19 information Net: Thursdays, 7.222 MHz, 0300 UT** Net Controls: Harry WB9EDP assisted by Jerry N4TSC.

**MARCO CW NET ( The Bob Morgan Memorial Net) Sundays,** one-half hour before the Grand Rounds on the Air net at 0930 central time, ckurrently 1530 UTC on 14.140 MHz Net control is Chip N5RTF

**Weekly Net Category II CME—on the HF Bands...**Our Radio-Internet Coordinator Chip Keister, M.D., N5RTF, New Orleans, LA livestreams our net online. Check into our nets and earn CME ... for times when propagation is poor when you would benefit from audio from anther receiver if you are away from your radio, in a skip zone, or unplugged due to thunderstorms, join the MARCO CW net and Grand Rounds by live internet streaming audio . These are recorded to listen in later to the online archive.

**To Listen:**

1. Use a browser to go to the following web page which has a player app and links to the audio stream and archive: www.marcoaudio.net.
2. The second way is to manually enter *http:marcoaudio.ddns.net:8011/stream into a standard music player or computer, phone, or portable device while the net is in progress.*

**********

**Where did "RADIO" get that name?**

The word is derived from the Latin *radius,* meaning a "*staff,*" or the "*spoke of a wheel,*" or a *ray of light.*" Radio waves travel like rays of light—going out in all directions like the spokes of a wheel.

**How did "Radar" get its name?**

It's just a combination of the initial letters of "***radio direction and ranging***" —an exact description of what it does.

**How did Uncle Sam get his name?**

The original "Uncle Sam"—goatee, twinkling eye, and all—was **Samuel Wilson**, born in West Cambridge, Massachusetts. In time, he moved with his brother Ebenezer to Troy, N.Y., where they formed a partnership in the meat-packing business. The brothers contracted to supply the Army with beef and pork during the War of 1812, and marked their shipping barrels "U.S." The soldiers jokingly called the meat "Uncle Sam's" beef or pork—since "Uncle Sam" Wilson's first two initials coincided with the "U.S." marking on the barrels. A soldier drew a caricature of Sam Wilson with his goatee and flowing hair and labeled the picture, "Uncle Sam of the U.S.A." This picture was the original of the ones used to depict "Uncle Sam" today. The first "Uncle Sam" died in Troy on July 31, 1854, and lies beside his brother, Ebenezer, in the Miller plot at Oakwood Cemetery. A monument has been erected in Troy to his memory.

**********

**The average married man** lives 6 years and 7 months longer than the average never-married man.

**********

**The first RADIO distress signal** was transmitted from the East Goodwin Lightship on 17 March, 1899 as it was being rammed by the *SS R. F. Matthews.* Prior to the SOS, the recognized call sign for ships in distress was CQD *(ComeQuickDanger).* The signal designed by the Marconi company and effective from 1 Feb. 1904 was intended to mean "*All Stations Urgent.*"

"*SOS*" was established as an international distress signal by an agreement made between the British Marconi Society and the German Telefunk organization at the Berlin Radio Conference of 3 Oct. 1906. It was formally introduced on 1 July 1908.

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## NEW FACES* for MARCO & RENEWALS, as of AUGUST 15th.

**NEW MEMBERS***

**RENEWALS**

Not available at press time.

**THE MARCO NEWS-LETTER (*AETHER)* is now alternately printed or via internet every other issue. Look for it……..**

In this form it gives more variety, is more economical and appears to please the most members.

**NO RADIO, NO ANTENNA?**
Keep in touch with MARCO on "*listserve*" E-Mail your request to join to BruceSmall73@gmail. Com If on the list simply contact marco-ltd@googlegroups.com

**And/or**

**Tune in to Marco Grand Rounds on your computer: www.reliastream.com/cast/start/tkeister**

## MEDICAL AMATEUR RADIO COUNCIL, LTD.,
## New Membership Application & Renewal form

**Best method process application online**
http://marco.ltd.org/join-marco-amateur-radio/

Once you fill out the online form it will be reviewed by the membership committee. Upon approval you will be invoiced by email with a link to pay online through PayPal. If you desire to pay by check mail the application to address below and we will invoice you.
Check your preference:

**One year membership $25 (USD); prorated to year end.**

**Two year membership $45 (USD); prorated, (*the default billing for renewal).***

**5 year membership $100 (USD); prorated.**

*Name:*_____
*Address:*
_____
_____

*Call Sign*_____ *Type License:*_____
*Phone:*_____
*Internet Address:*_____
*Your Birthday*_____ **(Year optional.)**
*Member ARRL*__

**Applications for membership should be sent to**
**Jay Garlitz, Secretary,**
**P.O. Box 1333**
**Hawthorne, Fl., 32640, U.S.A.**

**WHY NOT SEND A HAM FRIEND A MEMBERSHIP IN MARCO,**

Your Renewal Date
Is January 1 of each year

**Web Site: http://www.marco-ltd.org**

**MARCO** Grand Rounds is held every Sunday at 11 a.m. Eastern Time, 10 a.m. Central, 9 a.m. Mountain and 8 a.m., Pacific Coast time on 14.342. You qualify for one hour credit, Category II CME with your check-in.

MARCO NET SCHEDULE

| DAY | EASTERN TIME | FREQ | NET CONTROL |
|---|---|---|---|
| Sunday | 10:30 am | 14.140 | N5RTF (CW-net) |
| Sunday | 11 am | 14.342 | KD4GUA |
| Wed. | 8:30 pm | 7.22 | Pending |

Web Site: http://www.marco-ltd.org

MARCO'S AETHER

MEDICAL AMATEUR RADIO COUNCIL, LTD.,
6308 Kings Gate Circle, Delray Beach, FL 33484

**135th**
**Edition**

**August 2022**