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A non-profit Corporation, founded in 1965, privately supported for the public good and dedicated to the advancement of Medicine through Amateur Radio.

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listserve: http://googlegroups.com

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P.O. Box 127, Indian Rocks Beach, FL., 33785-0127

OSTEOPOROSIS

THE CURSE OF AGING.

Osteoporosis is a disease where decreased bone strength increases the risk of a broken bone. It is the most common reason for a broken bone among the elderly. Bones that commonly break include the back bones, the bones of the forearm and the hip. Until a broken bone occurs there are typically no symptoms. Bones may weaken to such a degree that a break may occur with minor stress or spontaneously. Chronic pain and a decreased ability to carry out normal activities may occur following a broken bone.

Osteoporosis may be due to lower than normal peak bone mass and greeter than normal bone loss. Bone loss increases after menopause due to lower levels of estrogen Osteoporosis may also occur due to a number of diseases or treatments including alcoholism, anorexia, hyperthyroidism, surgical removal of the ovaries, and kidney disease. Certain meds increase the rate of bone loss including some antiseizure medications, chemotherapy, proton pump inhibitors (knock out acid required for absorption of calcium) selective serotonin reuptake inhibitors and steroids. Not enough exercise and smoking are also risk factors. Osteoporosis is defined as a bone density of 2.5 standard deviations below that of a young adult. This is measured by dual-energy X-ray absorptiometry at the hip.

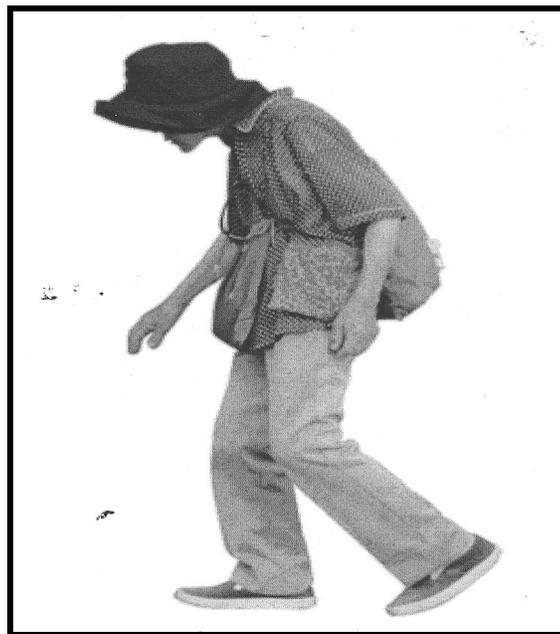
Prevention of osteoporosis includes a proper diet during childhood and efforts to avoid medications that cause the condition. Lifestyle changes such as stopping smoking and not drinking alcohol may help. Medication of the bisphosphonate type are useful in those with previous broken bones due to osteoporosis. In those with osteoporosis but no previous broken bones they are less effective. White and Asian people are at grater risk. The word "osteoporosis" is from the Greek for "porous bones."

The most common osteo fractures (Fxs) are of the wrist, spine, shoulder and hip. The symptoms of a vertebral collapse (compression fx) are sudden back pain, often with shooting pain down the nerve root compression and rarely with spinal cord compression. Multiple vertebral fxs lead to a stooped posture, loss of height and chronic pain with resultant reduction in mobility. Fractures of the long bones acutely impair mobility and may require surgery. Hip fx usually requires surgery and bring on the risks of deep vein thrombosis and pulmonary embolism with increased mortality.

Fracture risk calculators (FRAX and Dubbo) assess the risk of fx based upon several criteria, including BMD (Bone Mineral Density), age, smoking, alcohol usage, weight and gender.

The most important risk factors for osteo are advanced age (especially in women 4 to 1); estrogen deficiency following menopause or surgical removal of the ovaries while in men a decrease in testosterone levels has a comparable but less pronounced effect. A small inactive stature is also a risk factor. Female endurance athletes tend to have a decreased bone density with an increased risk. This may be due to suppressed of menstruation with intense training.

Many diseases and disorders have been associated with osteoporosis.



NEED CATEGORY I CME?

Go to www.mpmcme.org enter; go to "medical surgical archives" and a list will pop up...pick the lecture you want (includes mandatory ones) & when completed take the simple test and submit it to "Lee" for accreditation. When your medical license is up for renewal, notify Lee & she will submit the papers required. Tell her you affiliated with the hospital through MARCO and Dr. Warren Brown. (Tnx to Morton Plant Hospital, Clearwater, Florida, an associate of the University. of South Florida medical school.)

LATE BREAKING NEWS

Those Marco members wishing to receive the Marco Newsletter (Aether) electronically only should notify the News Editor (warren.brown1924@gmail.com). Those not responding will continue to receive the usual hard-copy by postal mail. If you receive the NL electronically you will not receive the postal-mail copy. (Members can now, & in the future, continue to receive the NL electronically by simply going to the Marco web site www.marco-ltd.org.

2016 marks the 50th Anniversary of Marco. The first meeting of Marco was held at the Chalfonte-Haddon Hall Hotel in Atlantic City, NJ of June 22, 1967 with Dr. Charles Gray WA1FMY, presiding.

All the founding fathers are now Silent Keys, but their legacy (Continued on Page 5)

WRITE TO US!
 We welcome your comments.
 Mail to Marco, P.O. Box 127,
 Indian Rocks, FL,
 33785. Email to
 warren.brown1924@gmail.com
 Letters may be edited for
 brevity & clarity.

MARCO NET SCHEDULE

<u>DAY</u>	<u>EASTERN</u>	<u>FREQ.</u>	<u>NET CONTROLS</u>
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

(Alternate **confidential** Grand Rounds frequency—
 on or about 14.344 or as announced on the air.)

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

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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.

Immobilization causes bone loss. Hypogonadal states can cause secondary osteo. These include Turner syndrome, Klinefelter syndrome, anorexia nervosa, andropause, hypothalamic amenorrhea or hyper-prolactinemia. Endocrine disorders such as Cushing's syndrome, hyperparathyroidism, hyperthyroidism, hypothyroidism, diabetes mellitus type 1 and 2, acromegaly and adrenal insufficiency. In pregnancy and lactation, malnutrition, malabsorption syndromes, Crohn's disease, ulcerative colitis, cystic fibrosis, bowel surgery, bulimia, inability to absorb calcium and vitamin D. Rheumatoid diseases, renal insufficiency, multiple myeloma, lymphoma and leukemia, hemophilia, Parkinson's disease.

Medication... Steroid-induced osteo arises due to use of glucocorticoids such as prednisone; barbiturates, phenytoin and some other anti-epileptics, over-replacement of thyroid hormone, methotrexate, depot progesterone, anticoagulants, proton pump inhibitors. Chronic phosphate binding may also occur with aluminum-containing antacids, some diabetic meds and lithium therapy.

The underlying mechanism in all cases is an imbalance between bone resorption and bone formation.

Diagnosis... Conventional radiography and by measuring the bone mineral density (BMD). The most popular method of measuring BMD is dual-energy X-ray absorptiometry (DEXA). One must rule out cancer with metastasis to the bones, multiple myeloma and Cushing's disease among others.

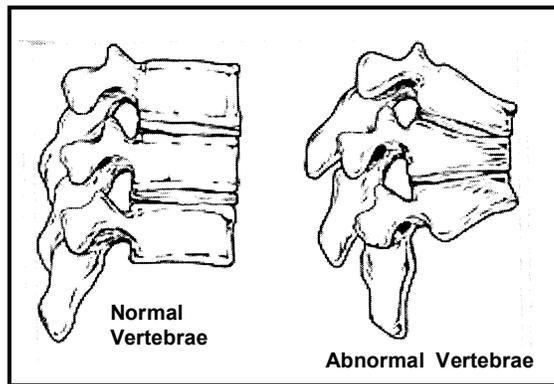
Radiography is relatively insensitive to detection of early disease and requires a substantial amount of bone loss (about 30%) to be apparent on X-ray. **Dual-energy X-ray absorptiometry** is the gold standard for the diagnosis. Osteo is diagnosed when the bone mineral density is less than or equal to 2.5 standard deviations below that of a young (30-40 year-old) healthy adult women reference population. This is translated as a T-score. But because bone density decreases with age, more people become osteoporotic with increasing age.

Biomarkers... Chemical biomarker are a useful tool in detecting bone degradation. The enzyme cathepsin K breaks down type-1 collagen protein, an important constituent in bones. Prepared antibodies can recognize the resulting fragment, called a neopeptide, as a way to diagnose osteoporosis. Increased urinary excretion of C-telopeptides, a type-1 collagen breakdown product also serves as a biomarker for osteoporosis.

Quantitative computed tomography (QCT) differs from DXA in that it gives separate estimates of BMD for trabecular and cortical bone and reports precise volumetric mineral density in mg/cm³ rather than BMD's relative Z score.

Quantitative ultrasound has many advantage in assessing osteo. The modality is small, no ionizing radiation is involved, measurement can be made quickly and easily, and the cost of the device is low compared with DXA and QCT devices. The calcaneus is the most common site for quantitative ultrasound assessment because it has a high percentage of trabecular bone that is replaced more often than cortical bone, providing early evidence of metabolic change. Also, the calcaneus is fairly flat and parallel, reducing repositioning errors. The method can be applied to children, neonates and preterm infants.

Screening... It is recommended that all women 65 years of age or



and men older than 70 be screened by bone densitometry.

Prevention... Stop smoking, stop drinking excess alcohol. Have an adequate calcium intake (at least one gram daily) and take vitamin D (400 I.U. daily) supplements if needed. Beware, an excess of calcium intake can increase the risk of heart attack, kidney stones and stomach problems. Vit. K deficiency is also a risk factor for osteo Fxs.

Weight-bearing endurance exercise and/or exercises to strengthen muscles improve bone strength in those with osteo. Aerobics, weight bearing, and resistance exercises all maintain or increase BMD in older women.

Medications... Bisphosphonates, such as **Actonel**, **Atelvia** (*Risedronate, tablets by mouth*), **Boniva** (*ibandronate, 3 mg i.v. every 3 months 150 mg tab by mouth monthly*), **Fosamax** (*Alendronate, daily tablet by mouth*), **Reclast** (*Zoledronic, 5mg IV once a year*) (are useful in decreasing the risk of future fxs in those who have already sustained a fx due to osteo. This benefit is present when taken for 3-4 years. Fx reduction is around 50%. There are concerns of atypical femoral fxs and osteonecrosis of the jaw with long term use, but these risks are low. With evidence of little benefit when used for more than 3-5 years and in light of the potential adverse events, it is appropriate to stop treatment after this time. In higher risk it is recommended to take up to 10 years of oral medication or 6 years of I.V. treatment.

For those with osteo but who have not had a fracture, evidence does not support a reduction in fx risk with risedronate (**Actonel**). Alendronate (**Fosamax**) decrease Fx of the spine but does not have any effect on other types.

Fluoride supplementation does not appear to be effective in post-menopausal osteo, as even though it increases bone density it does not decrease the risk of fx.

Miacalcin & Fortical (Calcitonin) has been shown to slightly effective in older women and is taken by nasal spray & injection. (Fortical is available only by nasal spray.)

Female Hormone replacement Raloxifene (**Evista**, 60 mg tab daily) while effective in decreasing vertebral fxs, does not effect the risk of nonvertebral fxs. And while it reduce the risk of breast cancer, it increases the risk of blood clots and strokes.

Other hormone replacement aids are **Climara**, **Ogen**, **Premarin**.

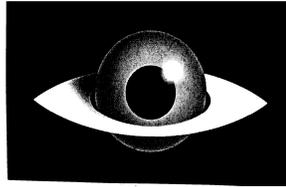
Osteoclast Inhibitors include **Prolia** (*Denosumab*) 60 mg subq every 6 months.

Parathyroid hormone, **Forteo** (*teriparatide*) 20 mcg subq daily.

A SKELETON WALKS INTO A BAR...the bartender says "What'll you have?" The skeleton replies, "Gimme a beer and a mop.

CRISPR The New Frontier of Medicine

In 1975, 140 scientists gathered in Monterey, California because they were worried about what was called “**recombinant DNA**,” the manipulation of the source code of life. It had been 22 years since Watson, Crick and Franklin described what DNA was—four different structures called bases stuck to a backbone of sugar and phosphate, in sequences thousands of bases long, DNA is what genes are made of, and genes are the basis of heredity.



Preeminent genetic researchers like David Baltimore, then at MIT, went to grapple with the implications of being able to decrypt and reorder genes. It was a God-like power—to plug genes from one living thing into another. Used wisely, it had the potential to save millions of lives. But the scientists also knew their creations might slip out of their control. They wanted to consider what ought to be off-limits.

At the end of the meeting, Baltimore and four others stayed up all night writing a consensus statement. They laid out ways to isolate potentially dangerous experiments and determined that cloning or otherwise messing with dangerous pathogens should be off-limits.

Earlier this year, Baltimore joined 17 others for another conference, this one in Napa Valley. There he was again, gathered with some of the smartest scientists on earth to talk about the implications of genome engineering.

The stakes, however, have changed. Everyone at the Napa meeting had access to a gene-editing technique called **Crispr-Cas9** (*clustered regularly interspaced short palindromic repeats*) a description of the genetic basis of the method; Cas9 is the name of a protein that makes it work. CrisprCas9 makes it easy, cheap and fast to move genes around—any genes, in any living thing from bacteria to people. **“These are monumental moments in the history of biomedical research,”** Baltimore said.

Using the three-year-old technique, researchers have already reversed mutations that cause blindness, stopped cancer cells from multiplying, and made cells impervious to the virus that causes AIDS. Agronomists have rendered wheat invulnerable to killer fungi, hinting at engineered staple crops that can feed a population of 9 billion on an ever-warmer planet. Bioengineers have used Crispr to alter the DNA of yeast so that it consumes plant matter and excretes ethanol, promising an end to reliance on petrochemicals. Startups devoted to Crispr have launched companies that have spun-up Crispr R&D. **Crispr make you see a gleaming world of the future.**

The technique is revolutionary and perilous. It could allow genetics to conjure everything anyone would want—designer babies, invasive mutants, species-specific bioweapons and a dozen other apocalyptic sci-fi tropes. It brings with it all-new rules for the practice of research in the life sciences. But no one knows what the rules are—or who will be the first to break them.

Humans were genetic engineers before anyone knew what a gene was. They could make corn sweeter, flatten bulldog’s faces—through selective breeding. But it took time and it didn’t always pan out. By the 1930s refining nature got faster. Scientists bombarded seeds and insect eggs with x-rays, causing mutation to scatter through genomes like shrapnel. If one of hundreds of irradiated plants or insects grew up with the traits they desired, they bred it and tossed the rest. That’s where red grapefruits came from, and most barley for modern beer.

Genome modification has become less of a crapshoot. In 2002, biologists learned to delete or replace specific genes using enzymes called zinc-finger nucleases; the next-generation technique used enzymes named TALENs.

The procedures were expensive and complicated. They only worked on organisms whose molecular innards had been thoroughly dissected—like mice or fruit flies. Genome engineers went on the hunt for something better.

As it happened, the people who found it weren’t genome engineers at all. They were researchers, trying to unravel the origin of life by sequencing the genomes of ancient bacteria and microbes, descendants

Continued on Page 9

NOTES FROM YOUR NEW PRESIDENT By Richard Lochner, M.D., K9CIV President of MARCO

I am honored to be your president for the next two years and look forward to meeting more of you and getting to know you better.

The question I want to answer to you is who did you elect? I have been licensed in ham radio since 1977 as WD9CIV and K9CIV. Though I wanted to have a license sooner circumstances didn’t allow this to happen. My radio station consists of an Yaesu FTdx 9000D and sometimes working SteppIR DB36. I belong to the Starke County Amateur Radio Club, Starke County, Indiana, and the Northwest Indiana Dx club. I currently serve as a Card Checker for the American Radio Relay League.



I am also an active Freemason especially York Rite Masonry. I am a Past Grand High Priest of the Royal Arch Masons of Indiana and now serve as their Grand Secretary. In the Blue Lodge and York Rite as well as some other appendant bodies I have served as the presiding officer.

As college approached in 1964 I was interested in ministry, medicine and electronics. I majored in Philosophy and Spanish in College and I was licensed to preach in 1966 and ordained into the ministry in 1972 in the United Methodist Church. In 1984, I left the pulpit ministry for other pursuits which included changing tires, computer programming and working for Goshen College as disc room supervisor,. In 1986 I returned to Goshen College and managed their Offset Printing department and the Mailing department. During that time I took my pre-med classes. In 1994, I entered Ross Medical School. I graduated in 1998 with clerkships at Jackson Park Hospital on the south side of Chicago. In 2000 I began residency at the Meadville Medical Center, Meadville, PA. It was a combined program both osteopathic and allopathic. I finished Residency as chief resident. I learned a lot in residency especially from a member of Marco, Dr. Robert Smith, who was the Director of the program

From there I went to Arkansas for three years working in a clinic and also working in the emergency room. At that time I returned to my home State of Indiana. I began a solo practice in Hamlet, Indiana and in 2010 moved to a federally qualified rural health center. I also have experience in urgent care with the Parkview Hospital system in Fort Wayne, Indian. I am now currently working in a federally qualified rural health enter in Knox Indiana. My major area of practice is Family Medicine. I have always wanted to work with the underserved population. And I have worked with several different HER’s. A useful tool I believe to allow one to concentrate on the patient. I continue to preach when called upon and provide ministerial service. So in the time of my life I have combined Ministry and Electronics.

My wife, Marcia, your former secretary, and I have been married 46 years and I have three boys two of which are active in the computer field and a third works at a local factory, here in Knox. No grandchildren yet.

Marco has a legacy I hope to contribute to and preserve.

PAST PRESIDENTS OF MARCO 2002-2016

(Earlier MARCO Past Presidents on Page 9)

Keith Adams MD	2002	N3IM
T. “Chip Keister MD	2004	N5RTF
Arnold Kalan MD	2006	WB6OJB
Harry Przekop MD	2008	WB9EDP
Linda Krasowski RN	2010	KE5BQK
Mary Favaro MD	2012	AE4BX
Jeff Wolf MD	2014	K6JW
Richard Lochner MD	2016	K9CIV

HISTORICAL FACT

Who says building a border wall won’t work? The Chinese built one over 2,000 years ago and they still don’t have any Mexicans! *(Devilish cunning these Chinese)*

LETTERS TO THE SOCIETY:

**Kudos from** (no luck this issue!)

From **Harry Przekop, Batavia, IL**...I moved from the city out near Fermilab about 5-minutes away. Consult on medicine, physics and forensics. I finally am in a home a rather big one, 4 bathrooms. Finally, I will have a radio room bigger than a small closet. If the Director at Large term is up and vacant I would like to put my hat in.

From **Robert Reichman WA3IHN, Escondido, CA** asks "why doesn't MARCO, a ham-health organ push for a safer Hara Arena in Dayton, Ohio, home of the "Hamvention" and possible future home of Legionnaires disease?"

Danny Centers W4DAN, Cleveland, TN., responds, *Reminds me of the flea floating down the river on his back yelling, Raise the draw-bridge!* How much muscle does MARCO have to push with?. I have heard many times that the Hamvention Committee has done much research about finding a new location, and concludes that here is no place else to go.

Marco President **Richard Lochner K9CIV** Knox, IN asks the question "Does Marco want to push this?" **Malin Dollinger KO6MD**, Rancho Palos Verdes, CA., complained about the rest-room facilities for the handicapped being inadequate and **Jeff Wolf K6JW** Rancho Palos Verdes, CA and others echoed Danny's comments.

Arnold Kalan, WB6OJB, Pacific Palisades, CA. Writes, "This afternoon I heard a Sirius radio commercial for Medishare Insurance Co., a Christian organization. I've already have received inquiries about how to join (Arnold is Director of Marco's MediShare department.), **Bruce Small KM2L, Clarence, NY** responded, "We get lots of email intended for them. Most of it is automatically redirected, but occasionally something slips through. FYI, the domain for the insurance company's email is medi-share.org with a hyphen. Ours is medishare.org without the hyphen

Jay Garlitz AA4FL, Hawthorne, FL., when asked the difference between DDS degrees and DMD degrees responded, "About half of dental schools grant each type. Historical oddity based on first of two dental schools in the nation calling their degrees one or other (Harvard DMD, Maryland DDS), and other newly created following the lack of a standard degree name. I prefer the one Univ. of Florida issues— Doctor of Dental Medicine."

HOW MUCH TIME BEFORE TAKING A SECOND PILL?

Since virtually everything eaten is broken down and distributed by the liver one realizes that sometimes the enzyme systems may be over-whelmed by a handful of different drugs at one time.

On questioning a pharmacist it was learned that at present there is no known time-factor list for individual drugs to be separated from each other by specific time intervals. Common sense however, indicates that if one separates drugs by 30 minutes or more there probably will be a maximum therapeutic gain in that drugs absorption and distribution.

It is generally believed that for maximum effect the number of different medicines should be limited to seven.

EDITOR'S NOTE: Walter Winchell began broadcasting in 1933 to an audience of 25 million people. The Winchell style was unmistakable. He talked rapidly 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.



QSL cards...Sending a QSL card with a self-addressed, stamped envelope helps boost the response rate from fellow hams. Stamps are made with a peel-and-stick adhesive. Placing one face down and taping it to the back of the QSI card, then mailing it as a postcard requires no envelope and stamps are the less-expensive postcard variety instead of first-class 47 center. The P.O. says it is okay and as a result you will have a higher response rate and spend less money.

Volunteer Examiner (VE) accreditation...ARRL accreditation renewal is automatic. VEs who maintain a current address, phone number, and e-mail address on file at the VEC office and have participated at an exam session within the past 5 years are valid. Renewal stickers, extending the VE's accreditation expiration date, are issued and should be placed on your credentials. After 5 years of inactivity, your VE accreditation will be placed on inactive status until you contact the VE office. Depending on the amount of time that has passed you may be required to reapply. No one's accreditation will be permanently revoked solely because of inactivity. A VE whose FCC license has expired is not eligible to administer any exam element.

Hot item at Dayton was the ICOM IC-7300 which should be available now....sells for around \$1,500 and according to ICOM all the bugs have been eliminated.

What is "virtual reality?" Virtual reality combines state-of-the-art imaging with computer technology to allow users to experience a simulated environment—as reality! Several technologies are integrated into a virtual reality system, including holography, which uses lasers to create three-dimensional images; liquid crystal displays; high definition television and multimedia techniques that combine various types of displays in a single computer terminal. It has made a rapid development recently due to its ability to present gaming to youngsters at an affordable price.

What makes knuckles crack? When a person pulls quickly on his or her finger, a vacuum is created in the joint space between the bones, displacing the fluid liquid normally found in the space. The popping sound occurs when the fluids rush back into the empty gap.

How much water is an inch of snow? An average figure is 10 inches of snow is equal to one inch of water. Heavy wet snow has a high water content; 4 to 5 inches of wet snow may contain 1 inch of water. A dry powdery snow might require 15 inches of snow to equal 1 inch of water.

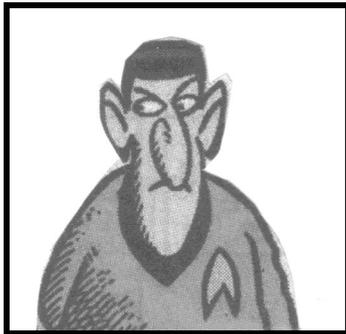
Went to the Air & Space Museum but there was nothing there!

Why are zero scores in tennis called "love"? In France, where tennis is popular, the round zero on the scoreboard looked like an egg and was called 'l'oeuf', which is French for 'the egg'. When tennis was introduced in the US, Americans mispronounced it "love".

Why do people clink their glasses before drinking a toast? Because in earlier times it used to be common for someone to try to kill an enemy by offering him a poisoned drink. To prove to a guest that a drink was safe, it became customary for a guest to pour a small amount of his drink into the glass of the host. Both would drink it simultaneously. When a guest trusted his host, he would only touch or clink the host's glass with his own.

What do they call a woman who always knows where her husband is? A. A widow!

If the value, shape, color or other characteristics of something does not change in distinguishable steps, it is an *analog* quantity. Your age, the color of tree leaves, the outside temperature and most things governed by nature are analog.



A microphone transforms human speech, an *analog* form of communication, into an electrical current that continually varies in accordance with the strength and frequency of the physical energy. At the output end, a speaker transforms the continuously varying *analog* current into physical energy so the ear can hear it.

When something changes in discrete steps or units, it can be thought of as a *digital* quantity. There is no in-between. The football score, the model year of your car, and the numbered of freshmen are digital values.

Digital computers know how to evaluate only two conditions. Everything is either on or off, high or low, one or zero, thus, computers communicate in digital form. Since the computer works in binary (meaning two conditions), each of its digits is a *binary* digit or *bit*.

All modern computer communication is done in digital form. Analog computers do exist, but they do not lend themselves easily to modern techniques.

In communications, distinguishing between analog and digital quantities is very important. With analog transmission techniques, an infinite number of points or values can be transmitted and received. With digital transmission, only discrete values can be transmitted and received.

Converting Analog to Digital...In many cases, we can digitize an analog quantity, that is, convert it into a digital quantity, and still be very close to its actual value. That's important to remember. Even analog quantities like sounds and pictures can be converted to digital form.

Let's consider how we are going to transmit digital information from one place to another. Our familiarity with the telephone will help to explain two additional terms, serial and parallel, which are common in data communications.

Serial...A single pair of wires connects each telephone to the central office. Without using special equipment and techniques, each pair of wires can carry only one conversation at a time. Once the conversation is completed, the same pair of wires can be used to carry another conversation, and then another.

If Bill and Susan both want to make a phone call at the same time, they can't do it with only one telephone set and one line. Susan can make her call, then when she finishes, Bill can make his call. The two calls are in series on the same one line.

Similarly, if only a single pair of wires is available, digital information must be transmitted one bit at a time along the wires. This is serial transmission.

Parallel...If Bill and Susan have access to two telephone sets, and if each is on a separate line, they can place their calls at the same time. The two calls occur in parallel, but two lines are required.

Internally, computers transfer data by moving several bits at one time. The number of bits that can be transferred at one time is called a byte. For personal computers, a byte is usually eight bits. When a number of pieces of information are all sent via a common circuit at the same time, the transmission is said to be in parallel. The number of communications paths inside the computer must equal the number of bits to be transferred at one time. Actually, it usually takes more than 8 communications paths to transfer eight bits of data in parallel because other signals are needed to coordinate the activity and these add to the number of paths required.

ARE YOU OPERATING ILLEGALLY?

Best to check your license expiration date; You didn't receive an extension when you upgraded.

You must apply 90 days before expiration and not more than 2 years after.

Lingers on.

The second annual meeting was held at the Jack Tar Hotel in San Francisco, CA, on June 28 1968 with Dr. Jack London K2JVA presiding.

Of the present long-standing members, **Dr. Fred Simowitz K0FS**, still active, appeared on the scene as President of MARCO in 1986. **Alfred Greenwald, M.D. WA2CBA**, gave a talk in Dayton on *A Very Large Array*, ("Don't call me Al!") and **Dr. Mike McGirr** and his wife **Susan** gave a talk on the DXpedition to the Island of Galapagos.

The sunspot cycle was at it's lowest point during this year but MARCO survived.

In 1989, **Dr. Ira Wexler W3HEF**, fathered the first annual "mini-meeting" of the eastern states in downtown Philadelphia with thirty attending. **Ed Briner, D.M.D. WA3TVG**, had just begun to learn how to compose the Newsletter with PageMaker, and the Laser Printer. Each issue got better...by 1999, it was noted, he will probably know how to use them. In 1999, ironically Ed became a Silent Key & Dr. Warren Brown KD4GUA took over his job as editor.

1990 was the year the late **Dr. Polycarp WB4LPC** told those attending about the horrible conditions at the hospital in Liberia where his mother had been a patient.

In 1991, **Dr. Robert "Smitty" Smithwick W6JZU** began scratching the surface of the work that they can do in helping developing third world hospitals get much needed help from us. Thus, MediShare was born.

New familiar names began appearing—**Robin Staebler NN3L**, **Robert Currier WB5D**, **Doug Badell N9IGB**.

The year 2000 issued in the advent of the "list-serve" initiated by **Robin Staeber** and **Bruce Small KM2L** and the turnover in leadership from **Dr. Bob Currier** to **Dr. Small**. The name of **Dr. Bob Morgan** began to appear as he babied the formation of a more active CW net.

Active membership in 2000 included names such as **Eugene Hoenig**, **Ian Kellman**, **Keith Adams**, **Judy Hoenig**, **Jeff Wolf**, **Chuck Lind**, **Jim Patterson**, **Warren Brown**, **Bruce Small**, **Chip Keister**, **Arnold Kalan**, **Mary Favaro**, **Al Breland**, **Paul Lukas**, **Roger Higley**, **Danny Centers**, **Bill Otten**, **Greg Johnson**, **Richard Doncaster**, **Doug Sanders**, **Rick Zabrodski**, **Louis Lyle**, **Ira Wexler**, **Carl Werntz**, *who did we miss?* Membership at that time was 145—today's listing includes 208 members. Today's Newsletter is sent to members in Brazil, Israel, Sweden, Canada, Japan, Finland.

We have met some unforgettable characters in our March of Marco. We have marvelous experiences of saving lives through Marco. We have tolerated each other miraculously and managed to "keep the ship going" as the late Robin Staebler requested prior to his unforeseen passing.

Who can forget Robin fishing from the second floor hotel window in Clearwater, FL. during a mini-hurricane or the opening of membership to "a licensed professional in the health field who owns a ham license in June 2000, later to be opened to "patients."

Do you remember trying to find the hotel in Chicago that began on the 14th floor of a downtown bank building? Or **Bruce KM2L** confronted by his double at the 2014 Dayton Ham-Fest...or the coyotes waiting at the door at the desert restaurant in El Paso, Texas?

KEEP MARCO PERKING !
 Pass this copy to a friend OR send us a \$15 membership



“You can never get enough of this wonderful stuff!”

INVENTION...The idea of wireless communication predates the discovery of “radio” with experiments in “wireless telegraphy” via inductive and capacitive induction and transmission through the ground, water, and even train tracks from the 1830s on. James C. Maxwell showed in theoretical and mathematical form in 1864 that electromagnetic waves could propagate through free space. It is likely that the first intentional transmission of a signal by means of electromagnetic waves was performed in an experiment by David Hughes around 1880, although this was considered to be induction at the time. In 1888 Heinrich Hertz was able to conclusively prove transmitted airborne electromagnetic waves in an experiment confirming Maxwell’s theory of electromagnetism.

After the discovery of these “Hertzian waves” (it would take almost 20 years for the term “radio” to be universally adopted for this type of electromagnetic radiation) many scientist and inventors experimented with wireless transmission, some trying to develop a system of communication, some intentionally using these new Hertzian waves, some not. Maxwell’s theory showing that light and Hertzian electromagnetic wave were the same phenomenon at different wavelengths led “Maxwellian” scientists such as John Perry, Frederick Trouton and Alexander Trotter to assume they would be analogous to optical signaling and the Serbian American engineer Nikola Tesla to consider them relatively useless for communities since “light” could not transmit further than line of sight. In 1892 the physicist William Crookes wrote on the possibilities of wireless telegraphy based on Hertzian waves and in 1893 Tesla proposed a system of transmitting intelligence and wireless power using the earth as the medium. Others, such as Amos Dolbear, Sir Oliver Lodge, Reginald Fessenden, and Alexander Popov were involved in the development of components and theory involved in the transmission and reception of airborne electromagnetic waves for their own theoretical work as a potential means of communication. \

Over several years starting in 1894 the Italina inventor Guglielmo Marconi built the first complete commercially successful wireless telegraphy system based on airborne Hertzian waves (radio transmission). Marconi demonstrated application of radio in military and marine communications and started a company for the development and propagation of radio communication services and equipment

19th Century...The meaning and usage of the word “radio” has developed in parallel with developments within the field of communications and can be seen to have three distinct phases: electromagnetic waves and experimentation; wireless communication and technical development; and radio broadcasting and commercialization. In a 1864 presentation, published in 1865, James Clerk Maxwell proposed his theories and mathematical proofs on electromagnetism that showed that light and other phenomenon were all types of electromagnetic waves propagating through free space. In 1886-88 Heinrich Rudolf Hertz conducted a series of experiments that proved the existence of Maxwell’s electromagnetic waves, using a frequency in what would later be called the *radio spectrum*. Many individuals—inventors, engineers, developers and businessmen—constructed systems based on their own understanding of these and other phenomenon, some predated Maxwell and Hertz’s discoveries. Thus “wireless telegraphy” and radio wave-based systems can be attributed to multiple inventors. Development from a lab demonstration to a commercial entity spanned several decades and required the efforts of many practitioners.

In 1878, David E. Hughes noticed that sparks could be heard in a telephone receiver when experimenting with his carbon microphone. He developed this carbon-based detector further and eventually could detect signals over a few hundred yards. He demonstrated his discovery to the Royal Society in 1880, but was told it was merely induction, and therefore abandoned further research. Thomas Edison came across the electromagnetic phenomenon while experimenting with a telegraph at Menlo Park. He noticed an unexplained transmission effect while experimenting with a telegraph. He referred to this as etheric force in an announcement on Nov. 28, 1875. Elihu Thomson published his findings on Edison’s new “force”, again attributing it to induction, an explanation that Edison accepted. Edison would go on the next year to take out US Patent 465, 971 on a system of electrical wireless communication between ships based on electrostatic coupling using the water and elevated terminals. Although this was not a radio system the Marconi Company would purchase the rights in 1903 to protect them legally from lawsuits.

- 1966: New York City, Wm. Sprague WA6CRN presiding.
- 1967: Atlantic City, Charles Gray, WA1FMY presiding
- 1968: San Francisco, Jack London K2JVA presiding
- 1969: New York City, Chet Samuelson K8WYP, presiding
- 1970: Chicago, Anson Hyde K5EK presiding
- 1971: Atlantic City, J. Stanley Karp presiding
- 1972: San Francisco, Earl Weston presiding
- 1973: New York City, Donald Needharn presiding
- 1974: Chicago, Walt Shrinter presiding
- 1975: Reston, VA. Walter Shrinter presiding
- 1976: Dallas Tx, J. Charles Jordan presiding
- 1977: St. Louis, MO., J. Charles Jordan presiding
- 1978: Hartford, CT. Fred Williams presiding
- 1979: Dallas, Texas, Don Ore presiding
- 1980: Oconomowoc, Wisconsin, Don Ore WB9CMT presiding
- 1981: Dayton, Ohio, Don Ore, KJ9B presiding
- 1982: Pittsburgh, Pa. Christine Haycock WB2YGA presiding
- 1983: Dallas, TX Melvin Grossman K5CY presiding
- 1984: Atlantic City, NJ., Richard Doncaster presiding
- 1985: Long Beach, CA., Fred Simowitz K0FS presiding
- 1986: Dayton Ohio, Dick Doncaster presiding
- 1987: Chicago, ILL., Fred Simowitz presiding
- 1988: Dayton, Ohio, Fred Simowitz presiding
- 1989: Williamsburg, VA, Ed Briner, WA3TVG presiding
- 1990: Dayton, Ohio, Ed Briner presiding
- 1991: SS Mississippi Queen, Pittsburgh to Wellsburg , K2UK
- 1992: Dayton, Ohio, Ed Ludin, K2UK presiding
- 1993: Las Vegas, NV., Robin Staebler NN3L presiding
- 1994: Dayton, Ohio, Polycarp Gadebegku WB4LPC presiding
- 1995: Charleston, SC, Polycarp Gadebegku presiding
- 1996: Dayton, Ohio, Ira Wexler W3HEF presiding
- 1997: San Francisco, Ira Wexler W3HEF presiding
- 1998: Dayton, Ohio, Bob Currier, WB5D presiding
- 1999: New Orleans, Bob Currier presiding
- 2000 Dayton, Ohio, Bruce Small KM2L presiding
- 2001 Clearwater, FL. Bruce Small presiding
- 2002 Then, almost all even years, MARCO met in Dayton, Ohio
- 2003 Philadelphia, Pa., Keith Adams presiding.
- 2005 New Orleans, LA, Chip Keister presiding
- 2007 Santa Monica, CA., Arnold Kalan presiding
- 2009 Chicago, IL., Harry Przykop presiding
- 2011 El Paso, Tx, Linda Kozlowski presiding.
- 2013 Myrtle Beach, SC., Mary Favaro, presiding.
- 2015 Los Angeles, CA., Jeff Wolf, presiding.

WHY YOU ARE NOT DEAD YET

Excerpts from Laura Helmut’s article in the Nov. 2015 Readers Digest.

The most important difference between the world today and 150 years ago isn’t airplane flight, nuclear weapons or the internet...it’s life span. We used to live 35 to 40 years on average but now we live to double that—***in other words, we now live two lives!***

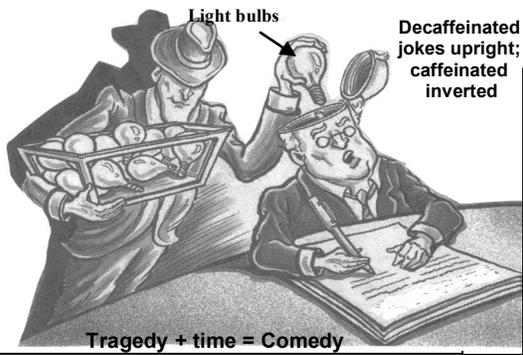
Have you ever had some health problem that could have killed you if you’d been born in an earlier era? The smallpox that didn’t kill you because of a massive vaccine drive; the cholera you never contracted because you drink filtered and chemical treated water. Then there was consumption (*tuberculosis*), quinsy (*tonsillitis*) fever, childbirth and worms. .

The first European settlers died mostly of starvation . Global trade introduced new diseases around the world and caused horrific epidemics until the 1700s when every germ had made landfall on every continent. Pioneers died in droves of dysentery, sequestered in damp log cabins teeming with mosquitoes and vermin. Elsewhere, T.B. brought people into ideal proximity from a germ’s point of view, as did factory work. Sadly, so did public schools .

Most of the effective medical treatments we recognize as saving our lives today have been available only since WW II. Antibiotics, chemotherapy, drugs to treat high blood pressure. Then of course there was insulin for diabetics—but the most effective treatments came from **clean water, soap, better housing, vitamins, quarantines, vaccinations and federal laws, such as the Pure Food and Drug Act of 1906.**

Vaccines have almost eliminated diseases that used to be common killers but they’re still around in other parts of the world. They only live once.

LIGHTEN UP...



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Jeff Wolf, M.D., K6JW, k6jw@arrl.net, 310 373 5970

Little Larry, skipped kindergarten class to attend a horse auction with his father. He watched as his father moved from horse to horse, running his hands up and down the horse's legs and rump, and chest. After a few minutes, Larry asked, "Dad, why are you doing that?" His father replied, "Because when I'm buying horses, I have to make sure that they are healthy and in good shape before I buy." Larry, looking worried, said, "Dad, I think the UPS guy wants to buy Mom..."



At a wedding ceremony, the pastor asked if anyone had anything to say concerning the union of the bride and groom. It was their time to speak or forever hold their peace. The moment of utter silence was broken by a young beautiful woman carrying a child. She started walking toward the pastor slowly. Everything quickly turned to chaos. The bride slapped the groom. The groom's mother fainted. The groomsmen started giving each other looks and wondering how to help save the situation. The pastor asked the woman, "Can you tell us why you came forward?" What do you have to say?" The woman replied, We can't hear in the back."

A guy goes ice fishing for the first time. All of a sudden, he hears a voice, "There are no fish under the ice!" He ignores it and moves to another area, cuts a hole, and tosses his line in. Again, he hears the booming voice: "There are no fish under the ice!" He nervously looks up and asks, "Lord? Is that you?" "No, this is the rink manager!"

Here's all you have to know about men and women. Women are crazy...men are stupid. And the main reason women are crazy is that men are stupid.

My boyfriend and I broke up. He wanted to get married, and I didn't want him to.

Why do blondes smile when lightning flashes? Because they think their picture is being taken.

An airliner was starting its descent and the pilot had forgotten to turn off the P.A. system. "As soon as I clock off," he said, "I'm going to have a nice cold beer and then blast that flight attendant." The horrified flight attendant made a dash toward the cockpit, but tripped over a

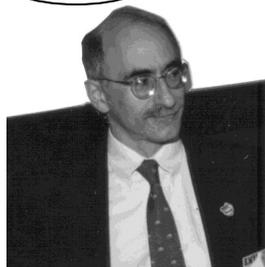
Daddy, what's a transvestite? Ask Mommy, he knows!

little old lady sitting in the aisle who whispered, "There's no need to hurry love, he said he was going to have a beer first!"

ON THEIR WEDDING NIGHT...the young bride approached her new husband and asked for \$20 for their first lovemaking encounter. In his highly aroused state, her husband readily agreed. This scenario was repeated each time they made love for more than 30 years, with him thinking that it was a cute way for her to afford new clothes.

Arriving home one day, she was surprised to find her husband in a very drunken state. He explained that his employer was going through a process of corporate downsizing and he had been let go. It was unlikely that, at the age of 59, he'd be able to find another position. Calmly his wife handed him a bank book which showed more than 30 years of steady deposits and interest totaling nearly \$1 million. Then she showed him certificates of deposits issued by the bank which were worth over \$2 million, and informed him that they were one of the largest depositors in the bank.

Faced with evidence of cash and investments worth over \$3 million, her husband was so astounded he could barely speak, but finally he found his voice and blurted out, "If I'd had any idea what you were doing, I would have given you all my business.!" **That's when she shot him.**



Bruce Small, KM2L

Marco Historian

30 YEARS AGO IN MARCO

The July-August 1986 MARCO Newsletter reported on Dick Doncaster WB3AJC's over the air assistance to,

the injured crew member of a boat off the coast of Columbia. The crew member had sustained a serious injury to his arm, and Dick provided advice on managing the situation until he could be evacuated.

Editor Ed Briner WA3TVG chided the group's members on their lackluster participation in the numerous scheduled nets and asked where the hell is everyone at 7.

We introduced new members Catherine Mullis KA1GJJ, Douglas Villa WB8UUB, Michael Pryce N8FNF, James Lee K5FW, Steve Artz W8KRA and Bruce Small KM2L.

On the technical side, this issue's installment of "The Easy Way" dealt with non-resonant antennas, line attenuation, the transmatch and the balun. In addition, Ed Ludin K2UK presented an introduction to packet radio.

Twenty Five years ago in MARCO

The July 1991 MARCO NL celebrated MARCO's 25th anniversary with a retelling of the story of the organization's founding and a brief recap of the first 25 years.

Bud Talbott KC2ZA contributed a lengthy piece detailing conditions in the area around Chernobyl, five years after the nuclear disaster in that city. He included additional correspondence form Dr. Val Pristavko UC1AWG, who requested aspirin, vitamins, clothing for the children under his care, pens and pencils and other school supplies. Bud also provided contact information for charities in this country who were part of the relief effort.

New members? We had 'em: Dorothy Ault KB2LGA, Donald Namm KN4UG, Ronald Smith N7PYA, Thomas McClain N3 RPR, Ron Lawrence WA6YTI, Edward King WM3T David Rathke KI5NG, Mark Carwell KA1TUN, Sheldon Wolf KC6SNX and K. Dan Howait KC6QFT.

There will be an East Coast Mini-Meeting and while the announcement listed the menu options, it neglected to mention the date or the city.

Twenty years ago in MARCO

To lead off the July 1996 MARCO NL, Ed Briner WA3TVG once again decried the poor participation in the scheduled nets. The number of sessions had been reduced from 12 per week to 5, but this did not translate into more check-ins.

Ron Levy K2AIO published an editorial in the NJDXA Newsletter which was reprinted for MARCO members. Dr. Levy saw the Internet as a great threat to the future of ham radio and urged us to plan for our survival.

Dick Brown, then W4VN/5 and later W5 Anthrax Anthrax, reviewed mad cow disease for the membership.

Fifteen years ago in MARCO

The August 2001 issue of the MARCO Newsletter featured a recap of the recently completed annual meeting in Clearwater, FL. Attendees included W6CS, N5RTF, AE4BX KF4DCK, KD4GUA, WB5D, W4TAD, KM2L, WA1HE, WB3FTJ, N3MBW, K3FP, KQ4IC, KZ4P, N3EL, KC9CS, assorted spouses, and plenty of rain. Our scheduled speaker was grounded in DC due to bad weather, so we did a fine job of entertaining each other at the banquet.

The Hoenigs WB3FTJ and N3MBW provided a copy of the recently adopted MediShare mission statement and organizational description.

We noted with sadness the passing of MARCO founding member Bill Sprague WA6CRN and also Eldon Snow WA7RPR and Ansel Martin KC2AS.

Bruce Small KM2L described his experiments with asymmetrical vee-beams. Bottom-line: They work better than one might think.

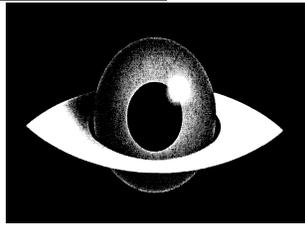
CALL	HRS.	NAME	QTH
KD4GUA	24	Warren	Largo, FL
KC9CS	23	Bill	Seminole, FL
NU4DO	22	Norm	Largo, FL
WB6OJB	22	Arnold	Pac.Pal. CA.
N9RIV	22	Bill	Danville, IL
N4TSC	22	Jerry	Boca Raton, FL
N5RTF	22	Chip	New Orleans, LA
KK1Y	21	Art	Seminole, FL
KNOS	20	Dave	Virginia
KM2L	20	Bruce	Clarence, NY
N2JBA	20	Ed	Amenia, NY
K9YZM	19	Mike	Crystal Lake, IL
K9CIV	19	Rich	Knox, IN
N6DMV	19	Paul	Torrance, CA
K6JW	19	Jeff	Palos Verdes, CA
WB1FFI	18	Barry	Syracuse, NY
N4MKT	18	Larry	The Villages, FL
W1BEW	18	Bobbie	Tennessee
N2OJD	17	Mark	Sidney, Ohio
W8LJZ	17	Jim	Detroit, MI.
W6NYJ	17	Art	Leverly Hills, CA
N5AN	17	Bud	Lafayette, LA
W3PAT	17	Marvin	Prosperity, SC
K3IK	16	Ian	Shavertown, PA
WB2MXJ	16	Joe	New Orleans, LA
WA3QWA	16	Mark	Chesapeake, VA
W4DAN	16	Danny	Cleveland, TN
WA1EXA	15	Mark	Cape Cod, Mass.
KD5QHV	15	Bernie	El Paso, TX
A1IN	15	Gonzo	Marietta, OK.
KE5SZA	14	John	Marietta, OK.
N4DOV	14	David	Ft. Lauderdale, FL
KE8GA	14	George	N. Carolina
WB9EDP	13	Harry	Illinois
W1WDR	13	Wayne	Parrish, FL.
N7MLN	13	Mort	Tucson, AZ
WA1HGY	13	Ted	Massachusetts
NOARN	12	Carl	Colorado
N8CL	10	Chuck	Albany, NY
W0UNZ	9	Paul	Warsaw, MO
K0FS	8	Fred	St. Louis, MO
KB5BQK	8	Linda	El Paso, TX
KE3XB	7	John	Nashville, TN
K4RLC	7	Bob	Raleigh, NC
N9GOC	5	Pat	Champagne, IL
K4JWA	5	Jim	W. Virginia
KD8IPW	5	Mary	W. Virginia

Those with 4 check-ins include: WB8GET, Keith, Oklahoma; W3VEC, Stephen in Springfield, PA; WBEYE, Darryl, Ohio; W4TX, Elwood in MS; W4EMD, Asif in SC; AE4BX, Mary in SC; WA9HIR, Bill, Berwyn, IL

YEAR	TOTAL CHECK-INS	AVERAGE PER SUNDAY
1998	694	14.46
1999	766	15.95
2000	1,035	20.29
2001	1153	22.60
2002	1383	26.15
2003	1489	28.63
2004	1534	29.50
2005	1517	29.17
2006	1531 (one extra Sunday)	28.89
2007	1591 (one extra Sunday)	30.02
2008	1524 (Only 46 nets)	33.14
2009	1533 (46 nets)	33.32
2010	1591 (44 nets)	36.22
2011	1514 (44 nets)	34.41
2012	1602 (44 nets)	36.41
2013*	1400 (44 nets) (New Freq)	31.82 (Year of Terrorist)
2014	1756 (47 nets)	37.36
2015	1722 (49 nets)	35.14
2016	879 (24 nets)	36.63

Record number of stations checked-in was 51, on Feb. 24, 2013

of the first life on Earth. Deep amid the basses, the As, Ts, Gs and Cs that made up those DNA sequences they noticed recurring segments that were the same back to front and front to back—**palindromes**. They named these clusters of repeating palindromes **Crispr**.



In 2005 a Danish biologist Barrangou spotted some of those same palindromic repeats in *Streptococcus thermophilus*, the bacteria that his company used to make yogurt and cheese. He noticed that the unidentified stretches of DNA between Crispr's palindromes matched sequences from viruses that had infected their *S.thermophilus* colonies. Like most living things, bacteria get attacked by viruses—called **bacteriophages** (phages). He went on to show the segment served an important role in the bacteria's defense against the phages, a sort of immunological memory. If a phage infected a microbe whose Crispr carried its fingerprint, the bacteria could recognize the phage and fight back. His colleagues realized they could save their company some money by selecting *S.thermophilus* species with Crispr sequence that resisted common dairy viruses.

As more researchers sequenced more bacteria, they found Crisprs again and again—half of all bacteria had them. Even stranger, some of Crispr's sequences didn't encode the eventual manufacture of a protein, as is typical of a gene, but instead led to RNA—single-stranded genetic material. (DNA is double-stranded).

That pointed to a new hypothesis. Most present-day animals and plants defend themselves against viruses with structures made out of RNA. So a few began to wonder if Crispr was a primordial immune system? Jill Banfield, at UC Berkeley, who had found Crispr sequences in microbes she collected from acidic, 110-degree water from the defunct Iron Mountain Mine in Shasta County, CA., but she needed help.

Luckily, one of the country's best-known RNA experts, a biologist Jennifer Doudna who worked at the same campus took notice. Doudna had made important discoveries revealing the three-dimensional structure of complex RNA molecules that could, like enzymes, catalyze chemical reactions. The mine bacteria piqued Doudna's curiosity, but she was unable to connect the bacterial immune system to the one plants and animals use. Still, she thought the system might be adapted for diagnostic tests.

Banfield wasn't the only person to ask Doudna for help with a Crispr project. In 2011, Doudna was approached by Emmanuelle Charpentier, a microbiologist at Umea a Swedish university. By sharing their research they discovered that a particular enzyme —namely Cas9—could function as a powerful pair of molecular scissors. Crispr, they discovered, could be programmed to target a specific section of DNA by loading it with its matching RNA sequence. Once paired, the Cas9 enzyme would cut out the matched section. "I had this gut feeling that this could be something really, really exciting said Doudna.

The two teams moved quickly to publish their findings.

Meanwhile, Feng Zhang, a molecular biologist at the Broad Institute of MIT and Harvard was able to utilize Doudna and Charpentier's work in his human cell research and was awarded the patent on Crispr-Cas9 as a method to edit genomes.

This started a firestorm as the Doudna group had filed for patents earlier. The stakes are high. Any company that wants to work with anything other than microbes will have to license Zhang's patent; royalties could be worth billions.

Dangers are the possibilities of wiping out entire species. Crispr could spell the end of mosquitoes and malaria both but what about the bats that rely on mosquitoes for food? Unintended consequences is a dangerous game.

Today you can go online to any number of biological-supply companies order your own Crispr kit for as little as \$130. The technique is being used in hundreds of labs across the US and around the globe. At New York City's Memorial Sloan Kettering Cancer Center, cancer biologist Scot Lowe is developing therapies that turn on and off

genes in tumor cells to make them easier for the immune system to destroy. Before Crispr, figuring out what effects a particular gene had on cancer required breeding mice that lacked the gene to see how their cancers progressed or didn't—a months-long endeavor. Now Crispr make it very easy in an afternoon to knock out a gene and study what effect it has on the tumor.

Already Crispr is producing clear results in practically every corner of biology. Researchers have corrected the genetic defect in Duchenne's muscular dystrophy in mice and deactivated 62 genes in pigs so that organs grown in the animals, such heart valves and liver tissue, won't be rejected when they are transplanted into people.

Malarial researchers are exploring a number of ways the Crispr can be used to manipulate mosquitoes to make them less likely to transmit the malady (since only females bite and spread the parasite, they're editing in sterilizing changes so the females can't reproduce. Eventually, the hope goes, malarial will cease to be transmitted.)

Some even see the technology as an answer to the growing problem of plastic waste. In Japan, scientists found a bacterium that can chew up the main element in landfills staples— like plastic shopping bags.

The real money is in human therapeutics. For example, labs are working on the genetics of so-called elite controllers, people who can be HIV+ but never develop AIDS,. Using Crispr, researchers can knock out a gene called CCR5, which makes a protein that helps usher HIV into cells. You'd essentially make someone an elite controller. Or you could use Crispr to target HIV directly; that begins to look a lot like a cure.

Engineered humans are a ways off-but nobody thinks they're science fiction anymore. Researchers have focused on the most controversial use—editing human reproductive cells like eggs, sperm and those in embryos (*The U.K. law prohibits letting human embryos in research to progress past 14 days*), which could be able to pass on their changes to future generations. Their conclusions were that using Crispr to modify human reproductive cells that would result in pregnancy should not be attempted at this time. Their position was based on the reality that precise as Crispr is, the technique still isn't perfect. Even more uncertain were the long-term consequences of altering genomes. It is well established, for example, that the mutation responsible for sickle-cell anemia also tends to protect people from developing malaria. What other risk-benefit balances would this kind of genetic editing disturb?

In Summary: We now have the power to quickly and easily alter DNA. It could eliminate disease,. It could solve world hunger. It could provide unlimited clean energy AND It could really get out of hand.

Information for the above was taken from Alice Park's fine article "Life, The Remix" which appeared in the July 4th edition of Time Magazine and Amy Maxmen's fine article which appeared in the August 15 edition of Wired Magazine & the Internet.

PAST PRESIDENTS OF MARCO

Marco organized in late 1965

William Sprague MD	1966	WA6CRN
Charles Gray MD	1967	WA1FMY
Jack London MD	1968	K2JVA
Charles Samuelson	1969	K8WYP
Anson Hyde MD	1970	K4EK
J. Stanley Karp MD	1971	KT1V
Earl Weston MD	1972	W8BXO
Walter Shriner	1974	W9CBG
J. Charlie Jordan Jr., MD	1976	K4IEP
Fred Williams MD	1978	WA4EFX
Donald Ore DDS	1980	KJ9B
Christine Haycock MD	1983	WB2YBA
Merve Grossman MD	1983	K6CY
Richard Doncasty MD	1984	WB3AJC
Frederick Simowitz MD	1986	K0FS
Ed Briner DDS	1988	WA3TVG
Edward Ludin MD	1990	K2UK
Robin Staebler MD	1992	K3FP
Polykarp Gadegbeku MD	1994	KZ4P
Ira Wexler MD	1996	W3HEF
Robert Currier MD	1998	WB5D
Bruce Small MD	2000	KM2L

Listing of more current past-Presidents, on Page 3

OVARIAN CANCER

Ovarian cancer is the most lethal gynecologic cancer. It affects women of all ages, but is most commonly diagnosed in those 55 to 64 years of age. About 90% of tumors are epithelial ovarian cancers that occur in the cells on the outer surface of the ovaries mostly in postmenopausal women. Germ cell tumors, which occur primarily in women in their early 20s from cells that form the eggs are found in less than 2% of ovarian tumors. About 1% are stromal cell tumors which begin in the tissue cells that hold the ovary together and produce hormones, and occur at any age/

Early diagnosis when tumors are small and still confined to the ovaries is the most important prognostic factor. Only about 45% of women with ovarian cancer survive five years or longer. The 5-year survival rate is 92% for women with stage I epithelial ovarian cancers but only 17-18% for those with advanced stage tumors. The incidence and mortality rates have decreased slightly over the previous 40 years which may be because of increasing rates of hormonal contraceptive use and decreasing postmenopausal hormone use.

Risk Factors: Genetic syndromes... Familial genetic syndromes are the strongest known risk factors, accounting for about 10% to 12% of ovarian cancers. BRCA gene mutations are involved in about 10% and hereditary nonpolyposis colorectal cancer (Lynch syndrome) is involved in 3% of cases.

BRCA1/BRCA2 tumor suppressor gene mutations are the cause of hereditary breast and ovarian cancer syndrome, which affects one in 300 to 800 women, but the prevalence may be higher than one in 50 among Ashkenazi Jews. In families with a history of ovarian or breast cancer, BRCA mutations are responsible for about 90% of cases of ovarian cancer. **The estimated lifetime risk of ovarian cancer is 40% in BRCA1 mutation carriers and 18% in BRCA2 mutation carriers.** Because of incomplete penetrance, however, 35% to 85% of BRCA carriers do not develop ovarian cancer and about 25% never develop breast cancer.

Other Risk Factors: Because only 10% to 12% of cases have a genetic basis, most women with ovarian cancer do not have a relevant family history. Known nongenetic risk factors are age over 40, postmenopausal hormone therapy (particularly for more than 5 years), obesity or weight gain, not having children or breastfeeding, and having had breast cancer. Previous tubal ligation & or hysterectomy will cut risks in half. The roles of diet, nonsteroidal anti-inflammatory drugs, perineal talc exposure and smoking are controversial and the effect of infertility drug treatment (*Clomid*) is uncertain. Family history of colon or breast cancer will increase the risks.

Presentation...About 60% of women with ovarian cancers have metastatic disease at the time of diagnosis because early stage disease is usually asymptomatic. Late-stage ovarian cancers often have symptoms, but they are usually nonspecific and not recognized as symptoms of cancer.

In a survey of 1,709 women with ovarian cancer, 72% reported having back pain, fatigue, painful sex, abdominal pain/boating, constipation or urinary symptoms for three months or more before diagnosis; 35% reported symptoms for six months or more.

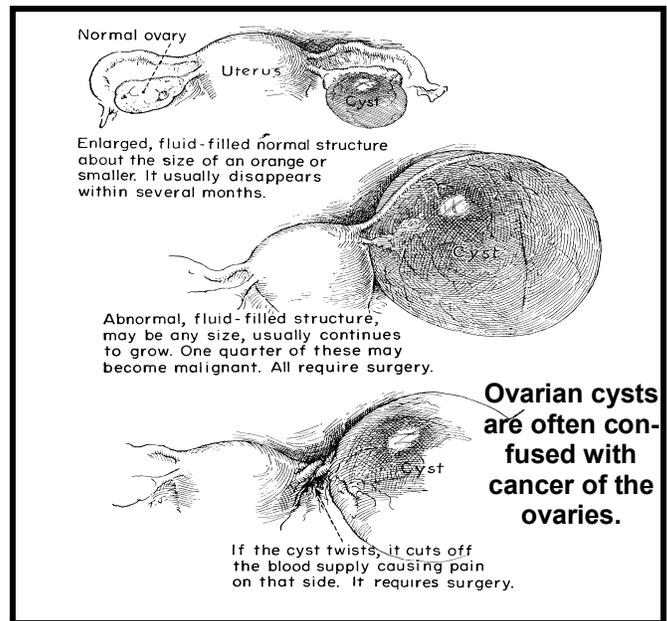
H & Px...Rectovaginal exam with the bladder empty to evaluate for pelvic and abdominal masses. The Px should assess for metastatic disease, including inguinal & supraclavicular lymphadenopathy, pleural effusions and umbilical mass. A **transvaginal ultrasonography or CT scan** which can assess ovarian architecture and vascularity, differentiating cystic from solid masses, and detect ascites. Lymph node biopsy & pelvic laparoscopy may help.

Lab Testing: CBC, chemistry profile and serum biomarkers including Cancer antigen (CA125) is the biomarker commonly tested, but its diagnostic ability depends on disease risk and stage at the time of presentation.

CA 125 is elevated in about 80% of epithelial ovarian cancers overall, but in only 50% of early stage disease. Furthermore, CA 125 can be elevated in benign conditions such as endometriosis and fibroids. The value of CA 125 is higher in postmenopausal women than younger ones, partly because of the higher pretest probability of cancer and lower prevalence of the benign lesions after menopause.

There are other serum biomarkers under investigation including human epididymis protein 4 (HE4), a glycoprotein expressed in about 1/3 of ovarian cancers that lack CA 125. HE4 is used primarily to assess disease progression and monitor for recurrence. However, a positive HE4 or

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CA 125 level during the diagnostic process may improve the sensitivity and specificity of the six item symptom index in 83.8% and 98.5%, respectively.

Biomarkers for nonepithelial ovarian cancers include inhibin A.B for stromal tumors, and serum α -fetoprotein and quantitative beta human chorionic gonadotropin (HCG) for germ cell tumors.

Indications for Referral... Women who have a high-risk family history should be referred for genetic testing. Women whose evaluation suggests ovarian cancer (based on imaging or lab test results) should be referred to a gynecologic oncologist. A serum CA 125 level greater than 200U per ml, in a premenopausal woman or any elevation in a postmenopausal woman, nodular or fixed pelvic masses, evidence of metastasis, or unexplained ascites are definite indications for referral.

Referral to a gyn oncologist is also recommended for women with suspicious or complex adnexal masses on transvaginal ultrasonography that persists on short-interval (one to three months) follow-up imaging: premenopausal nonpregnant women with an ovarian value greater than 20 ml; or women with ovarian volume greater than 10 ml after menopause.

Treatment: Surgery is the primary treatment. It is used for staging and cytoreduction (debulking), but it is potentially curative in disease confined to the ovaries. Fertility sparing surgery involving unilateral salpingo-oophorectomy, preserving the uterus and contralateral ovary is an option for younger women. Chemo & radiation is used in advanced cases mainly for palliation.

Screening: Transvaginal ultrasonography and CA 125 testing are the two most studied ovarian cancer screening modalities.

Prevention: Risk-reducing bilateral salpingo-oophorectomy is the most effective prophylactic treatment for BRCA carriers. It reduces ovarian cancer risk by 70-100%, but a small risk of developing peritoneal carcinomatosis remains. This procedure induces premature menopause with its attendant risk and limits reproductive capacity.

Other preventive measures are avoiding long-term (greater than 5 years) postmenopausal hormone therapy and maintaining a healthy lifestyle. Long-term hormonal contraceptive use is a promising chemo preventive approach even for BRCA1 carriers, and especially in women with early menarche, women who delay first pregnancy, or women who are infertile.

Staging:

Stage I...cancer found only in ovary or tubes.

Stage Ia...cancer found in one ovary or tube.

Stage Ib...cancer found in both ovaries or tubes.

Stage Ic...cancer has burst out of ovary or tubes.

Stage II...cancer has spread to the peritoneum but not lymph nodes.

Stage IIa...cancer has spread to the uterus.

Stage IIb...cancer has spread to the bladder & sigmoid.

Stage III...cancer has spread to the peritoneum & lymph nodes.

Stage IV...cancer has spread all over body.

"EMPIRE OF THE AIR" The Men Who Made Radio"

Excerpts from Tom Lewis fine book by that name

11

A New Empire for a New Century

Most people believe Guglielmo Marconi invented the radio, he did not. His contribution—however great—was actually the wireless telegraph, which permitted the transmission of coded messages through the air. Radio made a huge leap beyond the coded confines of the telegraph. It brought to the human ear the sounds of the human voice and music, sounds it seemed to pluck magically from the air. The telegraph and telephone were already instruments for private communication between two individuals. The radio was democratic; it directed its message to the masses and allowed one person to communicate with many.

The new medium of radio was to the printing press what the telephone had been to the letter: it allowed immediacy. It enabled listeners to experience an event as it happened. Rather than read, about Lindbergh meeting President Coolidge after his flight to Paris, people witnessed it with their ears and imaginations; rather than learn of the *Hindenburg explosion* the next day, people felt the power of the inferno the moment it occurred. Soon the human ear and imagination became insatiable: people wanted more of everything—music, talk, advice, drama. They wanted bigger and more powerful sets, and they wanted greater sound fidelity. Radio became a "godlike presence," as one essayist described it, which had taken over American lives and homes.

Radio as we know it was created by three men of genius, vision, determination and fascinating complexity.: **Lee de Forest**, the self-styled "father of radio, whose invention of the audion made long-range reception possible and provided the foundation for the modern electronics industry; **Edwin Howard Armstrong**, the resourceful inventor who created the unique system of FM broadcasting and whose discoveries for the framework for virtually all radio transmission and reception today; and **David Sarnoff**, the immigrant from Russia who rose from delivering telegrams for the Marconi Company to head the Radio Corporation of America (RCA). We never turn on a television, tune a radio or listen to a voice from space without being touched by one of Armstrong's or de Forest's inventions, inventions that Sarnoff was responsible for manufacturing and selling.

In this world of high-definition television bringing satellite-transmitted pictures from around the globe, we tend to think of radio as merely a quaint prologue to the present age. Radio was in fact the first modern mass medium prologue to the present age. Radio made America into a land of listeners, entertaining and educating, angering and delighting, and joining every age and class into a common culture. The various entertainers in the thirties and forties—the "golden age" of broadcasting—captured the imaginations of millions. People talked then as much about the schemes of Amos and the Kingfish or the visitors to Fibber McGee and Molly as they talk today about the latest guest on "Donahue" or Vanna White's dresses. Radio created national crazes across America, taught Americans new ways to talk and think, and sold them products they never knew they needed. Radio was the first national medium Americans knew, and it brought them the world.

In 1899, the year that wireless telegraph came to America, talk of electricity was everywhere. An advertisement in the *New York Times* proclaimed: ELECTRICITY lights our cities, runs our street cars, causes wagons without horses to go, permits us to talk great distances, will do our cooking and heating, will soon do everything!

Many people possessed an unbounded hope that science would redeem the world and many felt secure that our future greatness of the United States—and therefore human destiny—lay in discovering new ways to harness the electron.

People were beginning to see just what electricity could do. In American homes, people were emerging from the shadows of the evening and changing the natural rhythm of the body by staying up at night. "Electricity make it so very natural and convenient to light the room all at once," wrote the author of an article on equipping the modern city home in *Harper's Magazine*, that people would chose to "Live by night in a medium which facilitates their movement by



day."

From his office at 826 Broadway in New York City, Dr. Alfred Sanden was selling his electric belt that cured "impotency, lame back, nervousness, varicocele," among other maladies. "It gives you strength, because Electricity is Strength," the doctor confidently declared. Electricity was lighting cigars, running automobiles, and raising people in elevators higher than ever. Many people believed in an alchemy of the electron. Not unlike the scientist and student of natural philosophy Dr. Frankenstein, they hoped that the electron would enable them to create an ideal servant to do the work of the world. The electron would bring humanity to a new golden age.

In September 1899, Guglielmo Marconi, a twenty-five-year-old from Italy, arrived in New York with his recent invention—a wireless telegraph that, he promised, would report the international yacht races off Sandy Hook, New Jersey. Two steamships outfitted with his equipment would follow the yachts and send messages on the yachts' progress to a nearby shore station. The previous April, Marconi had prepared the U.S. for his visit by explaining the origin and development of his telegraph system in the *North American Review*. "The possibilities of wireless radiations," Marconi concluded, "are enormous." He was proving this almost daily. That very month he had successfully transmitted a message from France to England. American newspapers reported that the *London Times* had printed a brief dispatch from France. That message had come by wireless was news. The next month, at an electrical show in New York's Madison Square Garden, engineers gave small-scale demonstrations of Marconi's wireless telegraph apparatus to enthusiastic and awed onlookers.

Wireless, Marconi and others realized, promised a revolution in communication. Using electromagnetic waves, Marconi had been able to send messages over great distances at the speed of light. The telephone and telegraph could do the same thing, of course, but they were tethered to places wires could reach. The new technology suggested that a person in a remote corner of Kansas—or on a ship at sea—might someday be able to send an unostentatious message to a person across a continent or across the water. Wireless messages would shrink the globe and change the pace of the people who lived on it.

Communication before wireless had been limited by mechanics and costs. In 1899, it cost 2 cents and took six days for a one-ounce letter to travel from New York to San Francisco; a ten-word telegram sent and delivered by Western Union moved a great deal faster but cost \$1. Rates to foreign countries were even higher. A half-ounce letter sent from N.Y. to London cost 5 cents and, under the most favorable conditions, took nine days; a telegram cost 25 cents a word. Marconi hoped someday to bring those costs down, but he never saw the possibilities of sending voices through the air.

Though few wished to acknowledge it in 1899, America's position in the world was changing from a parochial, isolated nation into a significant world power. The nation had just won a victory over Spain in what Sec. of State John Hay once called a "splendid little war." That victory set the tone for much of the close of the century. Of short duration (about 111 days), the Spanish-American War cost little (about \$250 million) produced new territories (the Philippines, Puerto Rico, & Guam) and claimed but few casualties. A new century awaits the U.S.

(Continued Next Edition)

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Custer, James W0HJ
 Fatta, Louis KB900M
 Figlock, Ted W1HGY
 Ford, Robert W2REF
 Gallant, Heather* K1BOH
 Gershman, Jim* K1JJJ
 Kylakallio, Katrine OH3NF
 Louden, Stanley* NP2OX
 McGirr, Mike K9AJ



The following showed Interest:

Bejoy, Kuttikkate 2EOKFB
 Colen, David KAK9ZPL
 Jensen, Paul. OZ4UX

An Update Of Renewals and New Faces Will appear in the next issue.

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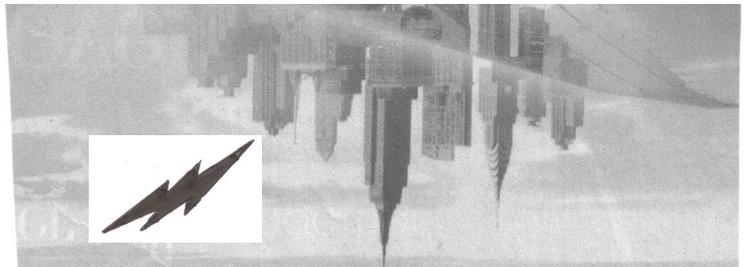
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