

Note recent important antiviral silver and copper references

"Study Shows Silver Nanoparticles Attach to HIV-1 virus" at <http://www.physorg.com/news7264.html>

"SILVER KILLS VIRUSES, STUDY FINDS" at <http://www.freemarketnews.com/WorldNews.asp?nid=1401>

"Safety of Colloidal Silver" at American Chronicle at
<http://www.americanchronicle.com/articles/view/49272>

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Links:

"Colloidal silver gaining ground as a proven, effective antibiotic remedy", July 26, 2005 by Dani Veracity, at <http://www.naturalnews.com/010038.html>

"SILVER Versus Other Antimicrobial Dressings: Best Practices!" Kevin Y. Woo, R.N., M.Sc., Ph.D. (C), A.C.N.P., G.N.C. (C), Clinical Scientist /Advanced Wound Specialist, Women's College Hospital, Toronto, Ontario, Canada, Elizabeth A. Ayello, Ph.D., R.N., A.P.R.N., B.C., C.W.O.C.N., F.A.P.W.C.A., Faculty, Excelsior College of Nursing, Albany, New York; President, Ayello, Harris and Associates, New York, New York, USA, R. Gary Sibbald, B.Sc., M.D., F.R.C.P.C. (Med) (Derm), F.A.P.W.C.A, M.Ed., Professor of Public Health Sciences and Medicine, University of Toronto, Toronto, Ontario, Canada

Abstract: All chronic wounds are colonized by bacteria. Increased bacterial burden or critical colonization can be deleterious to wound healing. In view of the ubiquitous presence of microbes, the clinician must discern whether bacterial balance (contamination or colonization) or bacterial damage has occurred. Silver is a common topical agent used to combat bacterial burden in chronic wounds. Given the wide array of silver-related wound care products, it is difficult to determine which product should be used. By reviewing relevant scientific evidence, we propose an acronym SILVER© to address the key contentious issues. These issues are summarized as SILVER: Signs of bacterial damage, the need for Ionic silver, Log reduction of bacteria, Vehicle (importance of moisture balance), Effect on normal cells, and Bacterial Resistance. at www.surgicaltechnology.com/17-050-WH-Abstract.html

"Silver Is The Key To Reducing Pneumonia Associated With Breathing Tubes: Silver kills bacteria and yeast by sticking to the organisms' enzymes, genetic material and other molecular components, preventing basic functions and interfering with reproduction. These organisms very rarely develop resistance to silver, and the metal has no known side effects in humans". Journal of the American Medical Association, Aug. 20, 2008 at <http://www.medicalnewstoday.com:80/articles/118743.php> and at <http://www.reuters.com/article/healthNews/idUSN1927463120080819>

Water Science and Technology 31:5-6 (1995) 123-129 - Rami Pedahzur et al. - The interaction of silver ions and hydrogen peroxide in the inactivation of E. coli: a preliminary evaluation of a new long acting residual drinking water disinfectant

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Water Science & Technology 42:1-2 (2000) 293-298 - R Pedahzur et al. - The efficacy of long-lasting residual drinking water disinfectants based on hydrogen peroxide and silver

Water Science & Technology 42:1-2 (2000) 215-220 - L Liberti et al. - Comparison of advanced disinfecting methods for municipal waste water reuse in agriculture

Accumulation of copper and silver onto cell body of and its effect on the inactivation of *Pseudomonas aeruginosa*

J Water Health - (2006) - David Collart et al. - Efficacy of oligodynamic metals in the control of bacteria growth in humidifier water tanks and mist droplets

Silver Institute at www.silverinstitute.org

Ions are positive, particles are negatively charged at <http://www.silver-colloids.com/Papers/IonsAtoms&ChargedParticles.PDF>

"Scientists to tackle illness (MRSA) with 'silver nanobullet' at <http://www.physorg.com/news63004522.html>

"Method for improving ultraviolet radiation disinfection of water using aqueous silver" US patent number 6,982,039 at <http://patft.uspto.gov/netacgi/>

Contract for Water Treatment Chemicals/Pool Ionization by State of Massachusetts at <http://www.mass.gov/epp/products/watertreat.htm> and at <http://www.mass.gov/epp/info/factsheets3/PoolIon2.pdf>

"Nanowires common in bacteria? Microbes may use electrically conductive nanowires, 10-20 nm diameter, to help transport electrons, (could be inactivated by silver nanoparticles)" at <http://www.the-scientist.com/news/daily/23924/>

"Cadbury failed to inform food watchdogs about salmonella contamination at one of its factories, despite nine cases of the bacterium being identified in chocolate over a four-month period", could have been prevented by silver nanoparticles, at http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2006/06/25/ncadbury25.xml&DCMP=EMC-new_25062006.

Safety of non-ionized Silver at World Health Organization at http://www.who.int/water_sanitation_health/dwq/chemicals/silver/en/

"Efficacy of oligodynamic metals (silver and copper) in the control of bacteria growth in humidifier water tanks and mist droplets" by David Collart, Sharifeh Mehrabi, Liah Robinson, Bryan Kepner and Eric A. Mintz, Department of Biological Sciences, Clark Atlanta University, Atlanta, GA, 30314, USA, Tel: +01 404 880 6854, Fax: +01 404 880 6640, dcollart@cau.edu, J. Water Health (2006) 149-156 at <http://www.iwaponline.com/jwh/004/jwh0040149.htm>

"Colloidal Silver Ceramic Filters for Household Water Treatment; Porous ceramic filter coated with colloidal silver • Ceramic material provides physical filtration • Silver acts as a bactericide" at www.who.int/entity/household_water/resources/Elliot.pdf Solutions Benefiting Life Institute Ltd.

Study Shows Silver Nanoparticles Attach to HIV-1 virus at <http://www.physorg.com/news7264.html>

SILVER KILLS VIRUSES, STUDY FINDS at <http://www.freemarketnews.com/WorldNews.asp?nid=1401>

The bactericidal effect of silver nanoparticles "Our results indicate that the bactericidal properties of the nanoparticles are size dependent, since the only nanoparticles that present a direct interaction with the bacteria preferentially have a diameter of ~1–10 nm" at <http://www.iop.org/EJ/abstract/0957-4484/16/10/059>

Antimicrobial powder coatings at: <http://www.pfonline.com/articles/020401.html>

Stroke risk linked to bacterial infection at New Scientist vol 178 issue 2392 - 26 April 2003, page 20 <http://archive.newscientist.com/secure/article/article.jsp?rp=1&id=mg17823921.800>

Bugs trigger attack on heart, New Scientist vol 180 issue 2422 - 22 November 2003, page 20

Heart-breaking bugs; Infections trigger heart disease?, New Scientist vol 169 issue 2284 - 31 March 2001, page 18

Bladder Biofilms: Escherichia coli forms intracellular biofilm-like pods in infected urinary bladders at <http://www.biomedcentral.com/news/20030704/03>

"Brigham Young University study shows colloidal silver is as good as penicillin for 17 organisms" at <http://www.amsilver.com/dnews2.htm> and at <http://www.prweb.com/releases/2002/3/prweb34782.htm> and at http://healthychristianliving.com/bacteria_testing.htm

"Silver Helps Regrow Tissues in Hundreds of Patients - Destroyed Cells Regenerate With Silver-Based Procedure" by Samuel Etris Senior Technical Consultant to The Silver Institute at <http://www.silverinstitute.org/news/4a1999.html>

"Antibacterial efficacy of a colloidal silver complex", Surg Forum. 1966;17:76-8. by Brentano L, Margraf H, Monafo WW, Moyer CA.

"The Role of Antimicrobial Silver Nanotechnology", A new silver nanotechnology chemistry can prevent the formation of life-threatening biofilms on medical devices. by Bruce Gibbins and Lenna Warner at Medical Device Link, August, 2005 <http://www.devicelink.com/mddi/archive/05/08/005.html>

"Metallic elixir: Silver may fight what ails you" at <http://www.amsilver.com/dnews1.htm>

"BACTERIA TESTING of a broad spectrum antimicrobial agent" at http://vitaminlady.com/Special/ASAP_%20SilverSolution.asp

"Gold Powder" at <http://www.twinflamedistribution.com>

"Scientists work to block bacterial communication by zapping blood" at <http://www.msnbc.com/news/858649.asp#BODY> or at bacterial communities

Colloidal Silver Database Web Site at <http://www.silvermedicine.org/>

University study documents the results of a quality colloidal silver product tested against a wide range of illness-causing pathogens. The study proves that colloidal silver is effective as an antibacterial agent against Staphylococcus, Candida, Salmonella and Pseudomonas in laboratory studies (in-vitro) at <http://www.silvermedicine.org/colloidalsilverstudytexas.html>

Article on CS <http://www.curezone.com/foods/silver.html>

Canadian BC government report on benefits and safety of Silver at <http://wlapwww.gov.bc.ca/wat/wq/BCguidelines/silver/>

"Brigham Young University study shows colloidal silver is as good as penicillin" at <http://www.amsilver.com/dnews2.htm>

"Metallic elixir: Silver may fight what ails you" at <http://www.amsilver.com/dnews1.htm>

"BACTERIA TESTING of a broad spectrum antimicrobial agent" at http://vitaminlady.com/Special/ASAP_%20SilverSolution.asp

There are thousands of links and several chat lines on the Internet about Colloidal Silver, such as www.silvermedicine.org or colloidalsilver2@yahoogroups.com or silver-digest-request@eskimo.com

Review of the best generators on the market at <http://www.silvermedicine.org/colloidal-silver-generators.html>

"Scots firm unveils lasting anti-MRSA soap containing silver" at <http://news.scotsman.com/topics.cfm?tid=303&id=882602006>

"Effects of Silver on Wound Management" by Robert H. Demling, MD; Professor of Surgery, Harvard Medical School; Director, Burn-Wound Center, Brigham & Women's Hospital; Leslie DeSanti, RN,; Director, Burn and Wound Care Program, Health South Braintree Rehabilitation Hospital, Research Associate, Brigham & Women's Hospital, Boston, Massachusetts at WOUNDS. Demling RH, DeSanti L. Effects of silver on wound management. WOUNDS 2001;13(1 Suppl A):1-15. "addition to antibacterial properties, there appears to be a prohealing property to silver". http://www.2012.com.au/Colloidal_SilverB.html

"Researchers Examine the Environmental Effects of Silver Nanoparticles: Now used in bandages, clothing, cosmetics, car wax, laundries, plastic tubing in beverage plants, hospital operating rooms, toys, food preservative, sewage treatment, drinking water" at <http://www.physorg.com/news97944800.html>

"Colloidal silver gaining ground as a proven, effective antibiotic remedy" at <http://www.newstarget.com/010038.html>

"Garments treated with metallic silver nanoparticles prevent colds and flu" at <http://www.physorg.com/preview97384337.html>

"Antibacterial silver products finally begin to emerge after years of FDA oppression" at <http://www.newstarget.com/010761.html>

"EPA uses nanotech regulation ploy to target colloidal silver while ignoring all other nanotech particles" at <http://www.newstarget.com/021231.html>

"Colloidal silver antibacterial liquid sprayed on Hong Kong subways as public health measure" at <http://www.newstarget.com/020851.html>

"A Small Supplement Company's Fight for Health Freedom" The persecution of Utopia Silver began five years or so ago. It is Utopia Silver's contention that the actions to restrict them are unconstitutional restraints on the freedom of commercial speech at <http://www.naturalnews.com/023719.html>

http://www.2012.com.au/Colloidal_SilverB.html

Laboratory results of a sample of our meso-silver and meso-gold showing particle size range from 1 to 8 nanometres at concentration of 24.2 ppm using high frequency pulse modulation, alternating polarity and constant current. Particles of less than 1 nanometre (such as mono-atomic) are likely present but beyond the range of the measuring equipment. Bacteriological analysis shows killing of Methacillin Resistant Staph Aureus (MRSA) in 8 minutes. MRSA is lethal bacteria commonly found in hospitals.

Colloidal Silver Bacteriology Study Results from <http://www.silver-colloids.com/Pubs/biostudies.html>

Challenge tests were performed on ten pathogens listed below. The testing was performed by EMSL Analytical, Inc. Microbiology Division. The tests were designed and conducted by Lori L. Daane, Ph.D., Director of Microbiology and Elizabeth Lewis Roberts, Ph.D., Microbiologist-Special Projects.

Aspergillus niger

Candida Albicans

Trichophyton rubrum

Escherichia coli

Escherichia coli O157H7 (hemorrhagic e.coli)

Vancomycin resistant Enterococcus faecalis (VRE)

Methicillin resistant Staphylococcus aureus (MRSA)

Pseudomonas aeruginosa

Vancomycin resistant Staphylococcus aureus (VRSA)

Staphylococcus aureus

Safety of Silver

The World Health Organization's (WHO) guidelines for drinking water quality indicate that there are no adequate data with which to derive a health-based value for silver in drinking water. These guidelines state that, "where silver salts are used to maintain the bacteriological quality of drinking-water, levels of silver up

to 0.1 mg/liter (0.1 parts per million) can be tolerated without risk to health." Silver is regulated by US Environmental Protection Agency (EPA) National Secondary Drinking Water Regulations.

The maximum permissible contaminant level of ionic silver salts in public water supplies is 0.1 mg/liter, which is a non-enforceable guideline based on possible cosmetic effects, such as skin discoloration. The safe level for non-ionic silver is much higher.

Surgical wound dressings; The following contain silver

Acticoat 7, Acticoat Absorbent, Acticoat Burn, Acticoat moisture control, Actisorb, Algidex Ag, Aquacel AG, Arglaes Film, Arglaes Island, Arglaes powder, Calgitrol Ag (foam), Calgitrol Ag Plus, Contreet Hydrocolloid, Contreet® Foam, Covaclear Ag, Flamazine, Silvadene, SSD Cream, Maxorb Extra Ag, Mepilex Ag, Optifoam Ag, PolyMem Silver, Prisma, SilvaSorb Cavity, SilvaSorb Gel, SilvaSorb Perforated, SilvaSorb Sheet, SilvaSorb Site, Silver Derm, Silvercel, Silverlon calcium alginate, Silverlon island wound dressings, Silverlon negative pressure dressing, Silverlon Wound Packing Strips, Silverlon wound pad dressings, Tegaderm Ag mesh, Urgotul SSD.

Ion versus Particles:

"Clearing the Confusion Spread by Mesosilver's Frank Key" Natural-Immunogenics News, May 25, 2005 at http://www.natural-immunogenics.com/news_detail.php?NewsID=10

Safety of Colloidal Particulate Silver versus risks of Ionic Silver:

"Argyria: clinical implications of exposure to silver nitrate and silver oxide", J Occup Med. 1979 Jun;21(6):430-5, Rosenman KD, Moss A, Kon S.

This article reports the clinical findings in a work force of 30 individuals who were exposed to silver nitrate and silver oxide. Six individuals had argyria and 20 had argyrosis (deposition of silver in the eye). Measurements of blood silver levels were included as part of the examination. The results of this examination generally support the benign nature of argyria, although the question of silver causing a decrement in kidney function and night vision is not settled. Periodic slit lamp examinations as well as monitoring of silver air concentrations are necessary to assure that engineering controls are actually limiting worker exposure to ionic silver salts. PMID: 469606 [PubMed - indexed for MEDLINE]

Silver in Food As reported by the Silver Institute, First Quarter 2004

AgIONS Technologies incorporated received approval by the FDA in October 2003 for use in the food industry. The FDA informed AgIONS Technologies that the product has been added to the FDA's list of food contact substances. The AgIONS Type AK product is comprised of 5% silver contained within an inert crystalline carrier. When subject to small amounts of moisture, AgIONS begins to release silver ions, which then act to eliminate bacterial growth on treated surfaces. AgIONS is specifically designed and engineered as a surface treatment system, with wide applications in the food processing industry. Since most food processing plants have a zero tolerance policy for bacterial spoilage, the use of silver to treat surfaces and equipment used in food processing will greatly reduce bacterial growth, even under the most challenging food processing conditions.

BOOKLETS FOR DISTRIBUTORS AVAILABLE in bulk from Biophysica or Amazon:

"Colloidal Silver: The Wonder Cure Time Forgot" by Tonita d'Raye, ISBN 1-889887-03 Price \$5 US

"Colloidal Silver: The Natural Antibiotic Alternative" by Zane Baranowski, ISBN 0-9647080-1-9 Price \$5 US

"Natural Alternatives to Antibiotics" by Ray C. Wunderlich MD, Page 24, Keats Publishing Inc. Price \$5 US

"The New Silver Solution" by Dr Kenneth Friedman, Ph.D., 2000 price \$6 US

"Nature's Silver Bullet" by Dr Howard Fisher B.Sc., B.Ed., D.C. 115 pages, \$12.95 US

Laboratory results suggest that Colloidal Silver solution is a broad spectrum antimicrobial agent—it is able to effectively stop the growth of, and in fact kill, a variety of bacteria at <http://www.amsilver.com/bacteria.htm> Specifically Staphylococcus aureus (Pneumonia, eye infections, skin infections (boils, impetigo, cellulitis, and post-operative wound infections), toxic shock syndrome,

meningitis, food poisoning, osteomyelitis, and many others) inhibited @ 2.5 ppm and killed @ 5 ppm. 1/22/99 BYU Report.

Shigella boydii (Bacillary dysentery—characterized by severe cramping abdominal pain and bloody diarrhea) inhibited @ 1.25 ppm and killed @ 2.5 ppm. 1/22/99 BYU Report.

Salmonella arizona (Food poisoning, etc.) inhibited @ 2.5 ppm and killed @ 5 ppm. 1/28/99 BYU Report.

Salmonella typhimurium (Food poisoning and enteric fever) inhibited and killed at a concentration of 2.5 ppm. 6/7/99 BYU Report.

E. coli (Food poisoning, urinary tract infections, traveler's diarrhea, diarrhea in infants, respiratory tract infections, and wound infections) inhibited and killed @ 2.5 ppm. 1/22/99 BYU Report.

Haemophilus influenzae (Otitis media (ear infection), pneumonia, meningitis, throat and sinus infections (including epiglottitis in children and sinusitis), and suppurative arthritis in children) inhibited and killed @ 1.25 ppm. 1/22/99 BYU Report.

Enterobacter aerogenes (wound infections, urinary tract infections, bacteremia, and meningitis) inhibited and killed at a concentration of 2.5 ppm. 6/7/99 BYU Report.

Enterobacter cloacae (causes illnesses similar to the *E. aerogenes*) inhibited and killed at a concentration of 5 ppm. 6/7/99 BYU Report.

Klebsiella pneumoniae (lower respiratory tract infections, nosocomial infections (infections spread in hospitals), urinary tract and wound infections, and bacteremia) inhibited and killed @ 2.5 ppm. 1/28/99 BYU Report.

Klebsiella oxytoca, (Similar to those infections caused by *K. pneumoniae*) inhibited and killed at a concentration of 2.5 ppm. 6/7/99 BYU Report.

Pseudomonas aeruginosa (severe burn and wound infections, keratitis, pneumonia, meningitis, nosocomial infections, urinary tract infections, etc.) inhibited @ 2.5 ppm and killed @ 5 ppm. 1/22/99 BYU Report.

Streptococcus pneumoniae (pneumonia, meningitis, sinusitis, otitis media (ear infection) inhibited @ 2.5 ppm and killed @ 5 ppm. 4/21/99 BYU Report.

Streptococcus pyogenes (skin infections, upper respiratory infections (i.e. strep throat) impetigo, hospital-acquired infections, scarlet fever, etc.) inhibited and killed @ 1.25 ppm. 1/22/99 BYU Report.

Streptococcus faecalis (Urinary tract infections, endocarditis, wound infections, etc.) inhibited @ 2.5 ppm and killed @ 5 ppm. 1/22/99 BYU Report.

Streptococcus mutans (A major cause dental plaque and tooth decay etc.) inhibited and killed @ 5 ppm. 2/3/99 BYU Report.

Streptococcus gordonii (Tooth decay, also implicated in infective endocarditis-an infection of the heart valves) inhibited and killed @ 5 ppm. BYU Report 2/12/99.

Selected Abstracts

"Assessment of the Antiviral Properties of Zeolites Containing Metal (silver & copper) Ions" Kelly R. Bright, Enue E. Sicairos-Ruelas, Patricia M. Gundy and Charles P. Gerba¹ Department of Soil, Water and Environmental Science, The University of Arizona, Building 38, Room 429, Tucson, AZ 85721, USA, December 2008 Food and Environmental Virology

Abstract The antiviral properties of zeolite (sodium aluminosilicate) powders amended with metal ions were assessed using human coronavirus 229E, feline infectious peritonitis virus (FIPV), and feline calicivirus F-9. Zeolites containing silver and silver/copper caused significant reductions of coronavirus 229E after 1 h in suspension. The silver/copper combination yielded a $>5.13\text{-log}_{10}$ reduction within 24 h. It was also the most effective ($>3.18\text{-log}_{10}$) against FIPV after 4 h. Other formulations were ineffective against FIPV. On plastic coupons with incorporated silver/copper-zeolites, $>1.7\text{-log}_{10}$ and $>3.8\text{-log}_{10}$ reductions were achieved for coronavirus 229E and feline calicivirus within 24 h, respectively. Silver/copper zeolite reduced titers of all viruses tested, suggesting that it may be effective against related pathogens of interest [i.e., SARS coronavirus, other coronaviruses, human norovirus (calicivirus)]. Of note, it was effective against both

enveloped and nonenveloped viruses. Metal-zeolites could therefore possibly be used in applications to reduce virus contamination of fomites and thus the spread of viral diseases.

“Dual use of silver for management of chronic bone infections and infected non-unions” Nand S; Sengar GK; Nand S; Jain VK; Gupta TD , GSVM Medical College, Kanpur, J Indian Med Assoc, 94(3):91-5 1996 Mar

Abstract: Broad spectrum antibacterial effect of electrically generated silver ions has been fully established. Present work consists of clinical evaluation of beneficial antibacterial effect of silver ions liberated electrically with the help of locally manufactured power pack in 920 proved cases of chronic osteomyelitis with or without pathological fractures and septic non-unions. Wound debridement, silver iontophoresis, proper immobilisation and subsequent wound care yielded not only control of bone infections in 85% cases, but also produced healing of pathological fractures in 83% patients. Results remained unaffected by age or sex of patient, type of bone involved, duration of previous illness or type of previous treatment. Follow-up varied from 6 months to 10 years. This technique is likely to open a new chapter in treatment of chronic resistant bone infections and septic non-unions due to open fractures particularly in developing countries of the world.

Disclaimer: The information conveyed here is based on records and research for your information which is for horticultural, educational, sacramental and research purposes only. No statement should be taken as medical advice. It is not claimed or implied here that Mono-atomic GOLD or SILVER-MAX or Colloidal mineral waters