

**Edited by:**  
**Dennis Scott BVSc**  
**MACVSc**

EA Veterinary Marketing Ltd  
54 Hobill Ave Wiri  
PO Box 97-110 Manukau City  
Manukau 2241

Ph 09-262-1388 Fax 09-262-1411  
Freephone 0800 800-624  
email eage@xtra.co.nz  
website www.eavm.nz

## Infection Control

### Inside this issue:

Infection Control Through the Ages	2
The Areas of Infection Control	3
So What is Electromicyn? The Gist	3
The Production of HOCl	4
HOCl in the Body	5
How HOCL Kills (How Electromicyn Works)	5
The Science is Sound	6
References	6
Infection Control Experts	

### Special points of interest:

- \* Exciting new product launch
- \* The future is here
- \* 21st Century technology means state of the art antiseptics
- \* The long mooted key to AMR-New chemicals?

We are turning infection control upside down.

New launches are always exciting for everyone concerned, however infection control is not a subject that many salespeople or clients actually find exciting.

Nevertheless the team at EA are more than excited, they are afire with enthusiasm for the launch of Electromicyn, a totally new concept in antiseptics.

Old dogma such as single molecule treatment being problematical, and antiseptics should not be used on wounds or on open skin or mucous membranes are being brushed aside.

That now has all changed with 21st Century technology.

We have an antiseptic that also works well and safely in wounds and on open skin or mucous membranes, and it is a single molecule product!

Electromicyn as a product is totally science based. The technology has been around in the human medical field

overseas for the last decade and now Ethical Agents are proud to be able to introduce it to the New Zealand Veterinary market.

In the current climate of antimicrobial resistance fears, (not just antibiotics but all antimicrobial products are under scrutiny), the call has been for the pharmaceutical industry to come up with new and innovative products.

Not only is Electromicyn new and innovative, but also, by deed of its physical rather than chemical effect on microbes, will not increase risk of resistance.

What is most exciting is the wealth of data in peer reviewed medical journals that our team will have on hand with them and be able to not only refer to but also make available to interested clients. Although it is not the 'sexiest' subject in the world it is little



wonder that the sales team are all highly excited.

21st Century, we are up and running!



## Infection Control Through The Ages

It is easy to write a short history on infection control and that is because the actual history itself is short, less than 200 years to be exact. The miasma theory was prevalent for centuries and it stated that disease is caused by foul air.

### Welcome to the 19th Century

The germ theory, that bacteria, not the air itself is the cause of disease, was first propounded 16th Century but wasn't readily accepted until 19th Century when it was experimentally proven by French scientist Louis Pasteur.

Infection control in surgery was developed by British surgeon Joseph Lister, "The Father of Modern Surgery". Lister, a professor of surgery at Glasgow, was the first to see the connection between Pasteur's discovery of the fermentation process and the suppuration of wounds.



He began applying carbolic acid to compound fracture wounds. The wounds healed without suppuration, amputation was averted, and the mortality rate from amputation plummeted from 45 to 15%.

Disinfection was generally a single chemical process, the advantages

being simplicity and economy. However negatives were that most had a single target, efficacy was variable and there was more rapid resistance development.

### Welcome to the 20th Century

Humans spent a lot of the 20th Century trying to kill each other so real progress on the infection control front came late in the century. The main types of disinfectants on the market were acids, halogens, oxidising agents, Quaternary Ammonium Compounds (QUATS), aldehyde compounds, biguanides, alcohols and phenolic compounds. All had their strengths and weaknesses but, although numerous disinfectants were available, no single agent or preparation was ideal for all purposes.

This led to the development of combination products, one of the first being cetrimide, a QUAT + chlorhexidine, a biguanide. QUATs are cationic detergents but cetrimide itself has low biocidal activity so, in fact, the combo is merely a cleanser containing chlorhexidine and sold on price.

In the latter half of the century it was found some were not just irritant but, especially aldehydes and some phenolic compounds, also highly carcinogenic.

The paradigm shift came with the development of a new chemical

class, a halogenated tertiary amine. This consisted of PHMB, a biguanide, plus two QUATs in addition to special surfactants. The chemicals act in synergy to strip the cell wall to allow bactericidal action and, having multiple targets there is a much lower risk of resistance. This product was TriGene II and robust testing proved it to be highly efficacious and also extremely safe.

### Welcome to the 21st Century

TriGene was reformulated in 2006 having an increased level of PHMB, safer, more effective surfactants and nano molecule technology to enhance penetration. This meant a lower concentration was needed resulting in less chemical used and even more safety. It became the green option and was launched as TriGene Advance and is now known, in the veterinary world, as SteriGene.

Antiseptics also have improved massively and the development of a stable form of hypochlorous acid, in the form of electrolyzed water, has turned the antiseptic world on its head.

Available for some years overseas this technology, known as Microdacyn in the medical world, has now been made available under the name of Electromicyn to the New Zealand veterinary profession.

## The Window Cleaner

Nagy once had a job as a window cleaner and he couldn't believe his eyes when he saw a young woman get out of the bath and start drying off right in front of him.

She was a feminist and, instead of screaming she stared straight back

at him in an effort to shame him. Their eyes locked in confrontation for an interminable minute; neither would budge.

Finally Nagy roared, "What are you staring at? Haven't you seen a widow cleaner before?"

## The Areas of Infection Control

In the veterinary world the four main areas of infection control are instrument sterilization, surface disinfection, antiseptics and chemotherapeutics. Clearly surgical asepsis requires managing all areas.

Sterilizing Agents kill everything (e.g. heat, radiation), disinfectants kill most things but are too strong for living tissues, while antiseptics are milder in action. They can be used topically, but not ingested. Chemotherapeutics can be ingested (e.g. penicillin, marbofloxacin).

Chemotherapeutics are selective antimicrobial drugs whereas antiseptics and disinfectants are non-selective antimicrobial agents that

cause the most destructive effects on the majority of microorganisms. While an important part of infection control chemotherapeutics are outside the scope of this particular article.

The gold standard for instrument sterilization is clearly the autoclave, but there are instruments that cannot be heat sterilized.

Up to recently, peracetic acid was the go to chemical for this indication but, as we have seen, chlorine dioxide wipes are simpler, faster and more effective at killing spores and are the best indication for non-lumened heat sensitive instruments.

SteriGene technology brought surface disinfection into the 21st century a decade ago, and is now the leading surface disinfectant in veterinary practice (and many other areas).

While New Zealand does not, as yet, regulate disinfectants to any great degree SteriGene has achieved the highly elusive TGA (Therapeutic Goods Australia – the equivalent of our Medsafe) approval as a hospital grade disinfectant.

Quite simply if you are not using SteriGene you are not serious about surface disinfection—the same should now apply for Electromicyn and antiseptics.

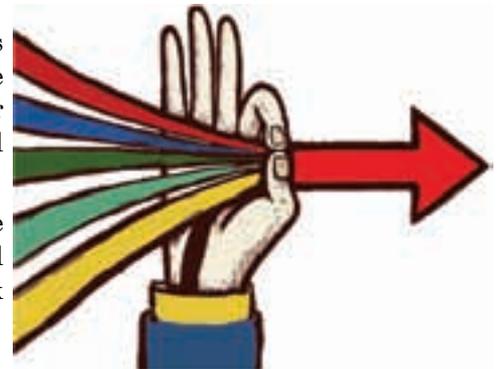
## So What is Electromicyn? The Gist.

Electromicyn, or veterinary branded Microdacyn, is simply known as electrolyzed water. It is also known as super oxidized water, which is vastly different from the quackery of super oxygenated water.

It is produced by applying an electric current to water and sodium chloride enabling the production of

hypochlorous acid. Hypochlorous acid is the safest and most effective sanitizer known. There are other ways to produce it but they all have drawbacks.

Oculus in the United States have patented an effective method and have strong scientific data to back up all claims.



## The Queen's Footmen....

Two blokes living in the Australian outback saw a couple of jobs advertised by the Queen of England.

She was looking for footmen, to walk beside her carriage.

They applied and were very happy to be flown to London for an interview with Her Majesty.

She says to them: "Because my

footmen must wear long white stockings, I must see your ankles to be sure they are not swollen or misshapen."

After they show her their ankles, the Queen says: "It is also important that you don't have knobble knees, so I need to see your knees too."

Once she has seen their knees, she

says: "Now everything appears to be in shape, so I just need to see your testimonials."

Nine years later,.....when the pair are finally released from prison, one of the blokes says to the other:.....

"I reckon, if we just had a bit more education we would have got that job!"

# Production of HOCl

## Chemically

Hypochlorous acid (HOCl) is a weak acid that forms when chlorine dissolves in water, and itself partially dissociates, forming hypochlorite (ClO<sup>-</sup>). HOCl and ClO<sup>-</sup> are oxidizers, and the primary disinfection agents of chlorine solutions. HOCl cannot be isolated from chemically produced solutions due to rapid equilibration with its precursor.

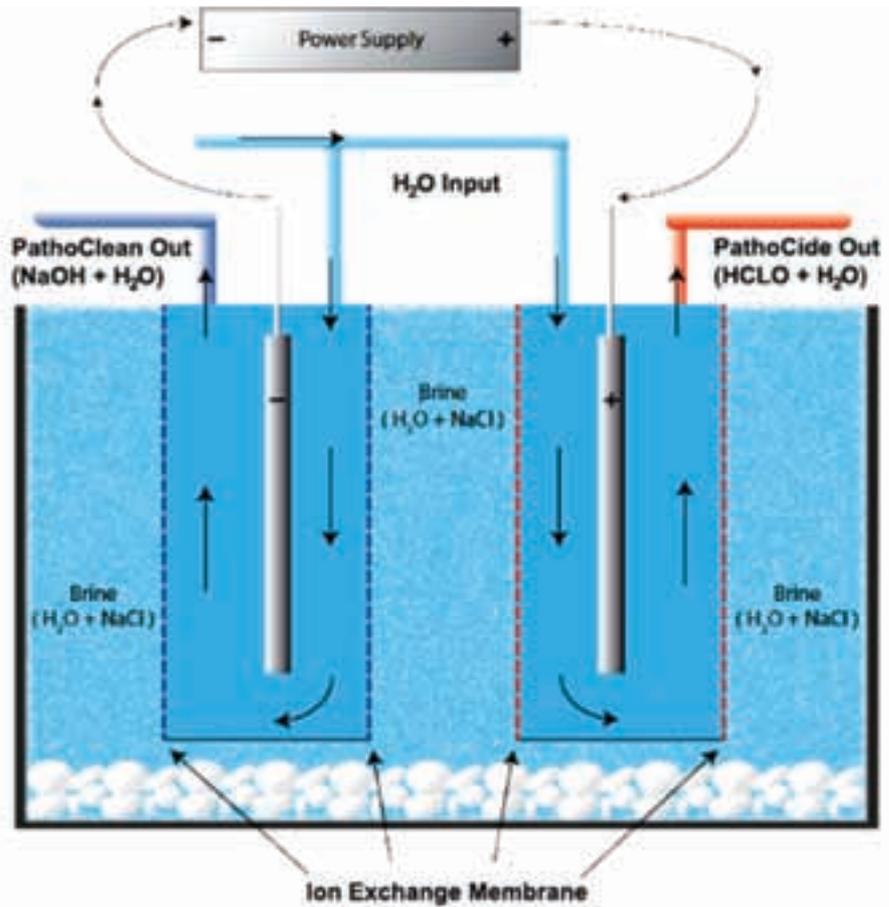
## Electrostatically

The key to delivering a powerful sanitizing agent is to form hypochlorous acid without elemental chlorine - this occurs at around neutral pH.

Super-Oxidized Solution contains trace quantities of stabilized oxidizing species; including Hypochlorous Acid & Sodium Hypochlorite.

The combination and specific ratio of oxidizing species is produced using a patented process resulting in a specific oxidative-reductive potential (ORP)

The tricks are, first of all, ion exchange membranes so that the HClO which gathers at the cathode and NaOH at the anode are kept apart. Also the pH is vital, as per the graph below, so that HOCl



is produced in preference to hypochlorite.

Then, and this is when the patent process applies, it has to be kept both hypotonic and stable for use.

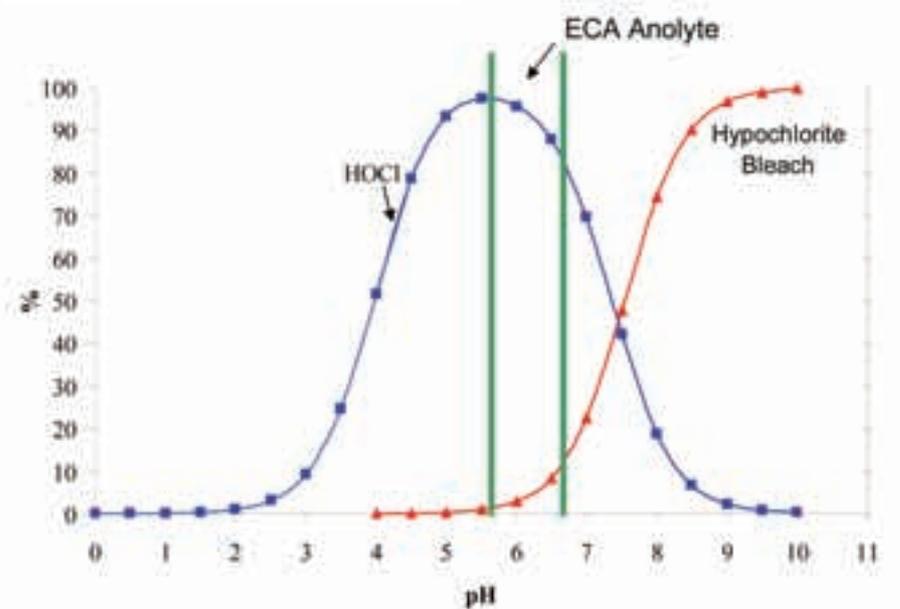
HOCl cannot be isolated from chemically produced solutions due to rapid equilibration with its precursor.

## Justice

The judge called the court to order to make a serious announcement. He said he had been bribed \$2000 by the defendant and \$3000 by the plaintiff.

“This is a serious matter,” he said.

“I’ve decided to return \$1000 to the plaintiff and judge the case on its merits.”



## HOCl in The Body

Hypochlorous acid is produced inside white blood cells (phagocytes).

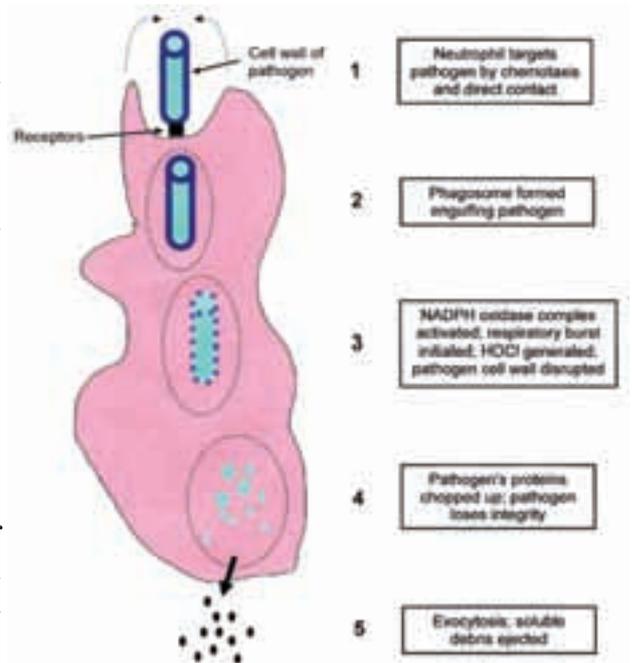
The phagocytes engulf the bacterial cells and sequester them in an intracellular compartment called the phagosome. During that process, phagocytes consume oxygen at a sharply increased rate in what is called a "respiratory burst."

The burst generates hydrogen peroxide along with highly reactive chemicals called free radicals (an atom or group of atoms with an unpaired electron). Meanwhile, granules inside the phagocyte release an arsenal of enzymes and toxic agents, including a bright

green enzyme found in pus called myeloperoxidase, into the phagosome.

Myeloperoxidase in turn reacts with the hydrogen peroxide and chloride generating a powerful weapon against bacteria: hypochlorous acid.

Hypochlorous acid contains a free radical so is highly reactive. It disrupts the outer layer of the bacterial cell wall causing leakage and lysis of the cell.



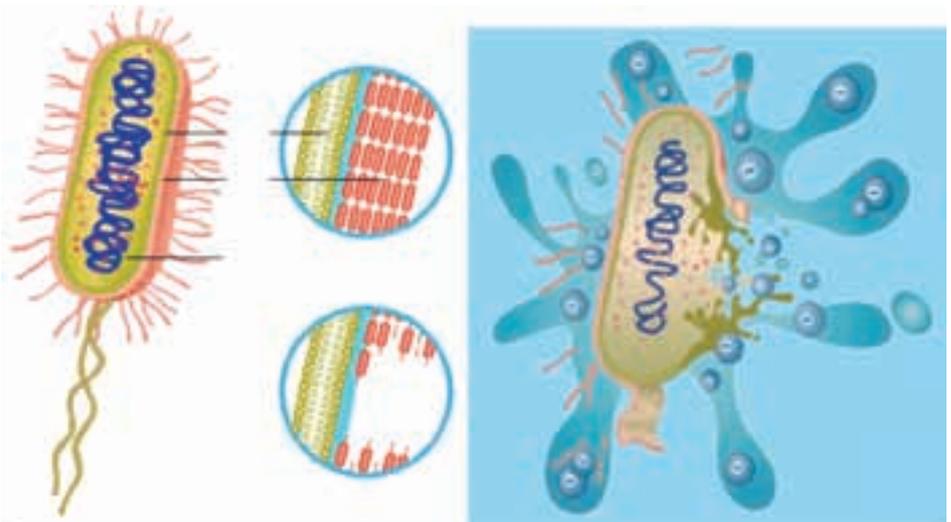
## How HOCl Kills (How Electromicyn Works)

The specific oxidative-reduction potential of Electromicyn disrupts the biochemical bonds of microbes such as bacteria.

Basically it is a matter of electrical instability producing holes in the bacterial cell wall.

Since our body's own cells have the necessary processes to prevent cell damage, they are not harmed.

Electromicyn is very hypotonic (13mOsm/L) this ensures water increasingly flows, very quickly, into the cell. The sudden increase in internal pressure causes the cell to rupture.



**This purely physical effect is extremely efficient at reducing pathogen load, and limits any chance of future resistance.**

## Country Politics

Nagy was leaning on a bar in a country pub chatting to the locals, when the subject turned to politics.

"I can't stand that Andrew Little, he's got a face like a sheep's head," he said.

He was immediately thrown out the doors, landing in the middle of the main street.

"What was all that about?" he asked, dusting himself down in a daze.

"I did not realise you would feel so strongly. Is this Labour Party territory?"

"No," said a rather indignant farmer, "this is sheep territory."

## The Science is Sound

At first glance the terms ‘super oxidized water’ and/or ‘electrolyzed water’ could conjure images of alternative medicine or be compared with that snake oil product ‘super oxygenated water’.

Nothing could be farther from the truth. The science is sound and also profound and, not only that, it is the latest, up to date technology.

Electromicyn is totally science based and there is a wealth of data attesting to its benefits in highly regarded peer reviewed journals.

The EA team is fully informed and carry with them a booklet composed of an impressive array of references (listed below). No wonder they are excited!

All, or any, of these references are available, not only from application to head office but also via the team in the field.

Each member will have a flash drive in their possession and thus it is a simple matter to download the data directly on to a clinic computer for later perusal.



**REFERENCES  
MASTER FILE**

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# Infection Control Experts

Having been involved in selling infection control products (antibiotics, antiseptics and disinfectants) for many years and having recently undergone up to date training sessions the EA team can rightly regard themselves as infection control experts.

While acknowledging that they do not have the general skills of qualified veterinarians they are now actually in a position of knowing more than the average practitioner about this rather specialized subject. Each has been given a very unofficial and light hearted certificate attesting to their expertise in this field.



Ethical Agents Veterinary Marketing deals with antibiotics of all the colours in the traffic light system and so the team are upskilled on the indications for each. We also have marketed several different disinfection systems and antiseptic products and know all their strengths and weaknesses.

They can attest to the advantages of SteriGene as a surface disinfectant and the revolutionary new Electromicyn as antiseptic of choice and not only should they be able to answer any questions on the subject, they also will carry peer reviewed papers to back up claims and have them in electronic

form for any clinician wanting to download for later viewing.

They have up to date 21st Century scientific data in this complex field and are happy to discuss it at any time.

After all they are all imbued with the maxim of “No one cares how much you know until they know how much you care”.

Yes, the bonnets and mortar boards in the photos of the team are all added in by Photoshop; team training may involve some high powered learning but nobody said it should not be fun.

The EA team are not only the happy team, they also know their stuff. They all invite you to test their expertise!

**“No one cares how much you know until they know how much you care”**



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## The Altar Boy

An altar boy goes to confession:

'Bless me Father, for I have sinned. I have been with a girl.'

The priest asks, 'Is that you, little Joey Pagano?'

'Yes, Father, it is.'

'And who was the girl you were with?'

'I can't tell you, Father, I don't want to ruin her reputation.'

'Well, Joey, I'm sure to find out her name sooner or later so you may as well tell me now. Was it Tina Minetti?'

'I cannot say.'

'Was it Teresa Mazzarelli?'

'I'll never tell.'

'Was it Nina Capelli?'

'I'm sorry, but I cannot name her.'

'Was it Cathy Piriano?'

'My lips are sealed.'

'Was it Rosa DiAngelo, then?'

'Please, Father, I cannot tell you.'

The priest sighs in frustration. 'You're very tight lipped, and I admire that. But you've sinned and have to atone. You cannot be an altar boy now for 4 months. Now you go and behave yourself.'

Joey walks back to his pew, and his friend Franco slides over and whispers, 'What'd you get?'

'Four months holiday and five good leads...'

