Maintaining the Health of the Environments

in

Hospitals and Community Health Centers

by

ECO SYS

www.fajarindonusantara.com

Rumah Sakit adalah institusi pelayanan kesehatan yang menyelenggarakan pelayanan kesehatan perorangan secara paripurna yang menyediakan pelayanan rawat inap, rawat jalan, dan gawat darurat. (UU No. 44 Tahun 2009 tentang Rumah Sakit).

Namun sebagai tempat berkumpulnya banyak orang, baik orang sakit maupun orang sehat, Rumah Sakit memungkinkan risiko terjadinya pencemaran lingkungan, gangguan kesehatan dan dapat menjadi tempat penyebaran/penularan penyakit.

Oleh karenanya pencegahan epidemi dan kontrol kualitas air dan udara di Rumah Sakit menjadi sangat penting. Dalam kenyataan upaya tersebut belum sepenuhnya dapat dilaksanakan karena berbagai kendala khususnya kurangnya pemahaman masyarakat.

Hospital-Acquired (*Nosocomial*) Infections (Infeksi Nosokomial)

Infeksi nosokomial (Inos) sangat merugikan masyarakat pengguna fasilitas peiayanan kesehatan di Rumah Sakit dan Sarana Pelayanan Kesehatan lainnya.

Kejadian Inos juga dapat digunakan sebagai indikator mutu pelayanan kesehatan yang ada di RS. Tinggi rendahnya angka Inos, merupakan bukti konkrit dari baik buruknya kualitas pelayanan kesehatan dan keperawatan di RS.

WHO 1986, melaporkan infeksi nosokomial sebagai masalah global dan menjangkau paling sedikit sekitar 9% dari 1,4 juta pasien rawat inap di RS di seluruh dunia, bahkan di negara maju seperti Amerika Serikat yang memiliki dana yang besar untuk menanggulangi infeksi nosokomial mempunyai angka infeksi nosokomial sekitar 5-10%.

What Are Nosocomial Infections?

The term "nosocomial" comes from two Greek words: "***nosus***" meaning "disease" + "***komeion***" meaning "to take care of."

Infeksi nosokomial adalah infeksi yang didapat di rumah sakit dan fasilitas pelayanan kesehatan lainnya.

Dapat diklasifikasikan sebagai infeksi nosokomial apabila pasien telah diterima untuk alasan lain selain infeksi. Dia juga harus menunjukkan tidak ada tanda-tanda infeksi atau inkubasi aktif.

Dapat diindikasikan Infeksi Nosokomial, apabila hal tersebut terjadi :

- Di atas 48 jam setelah admisi Rumah Sakit
- Di atas 3 hari setelah keluar dari perawatan Rumah Sakit
- Di atas 30 hari setelah tindakan operasi
- Dalam fasilitas kesehatan (Rumah Sakit), jika penyebab awal pasien masuk bukan karena infeksi.

"In the United States, it has been estimated that 9.2 out of every 100 patients acquire a nosocomial infection" (Jarvis, et al., 1991).

Nosocomial infections are infections that have been caught in a hospital and ***are potentially caused by organisms that are resistant to antibiotics***.

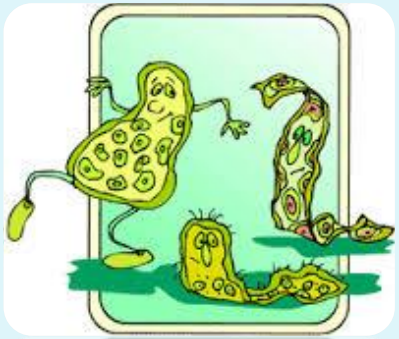
A bacterium named ***Clostridium difficile*** is now recognized as the chief cause of nosocomial diarrhea in the US and Europe. ***Methicillin-resistant Staphylococcus aureus*** (MRSA) is a type of staph bacteria that is resistant to certain antibiotics and may be acquired during hospitalization.

Last Editorial Review: 10/30/2013
http://www.medicinenet.com/script/main/art.asp?articlekey=4590

Types of Nosocomial Infections

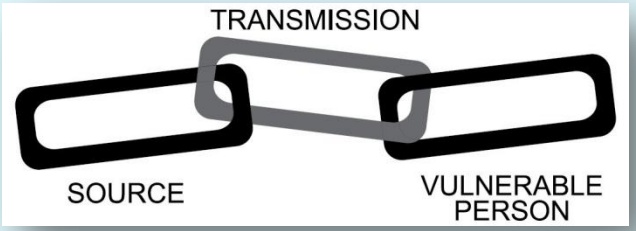
Urinary tract infections are the most common type of nosocomial infection. In the United States, surgical site infections, bloodstream infections, and pneumonia are the other most common types (WHO, 2012).

The location of a nosocomial infection depends on the nature of a patient's hospital procedure.



Types of Nosocomial Infections

Nosocomial infections



Known also as hospital-acquired infections, hospital-associated infections, and hospital infections - are infections that are not present in the patient at the time of admission to hospital *but develop during the course of the stay in hospital*. There are two forms:

1. *Endogenous infection, self-infection, or auto-infection*. The causative agent of the infection is present in the patient at the time of admission to hospital but there are no signs of infection. The infection develops during the stay in hospital as a result of the patient's altered resistance.
2. *Cross-contamination followed by cross-infection*. During the stay in hospital the patient comes into contact with new infective agents, becomes contaminated, and subsequently develops an infection.

While there is no clinically significant difference between the endogenous self-infection and the exogenous cross-infection, the distinction is important from the standpoint of epidemiology and prevention.

Who Is at Risk for Nosocomial Infections?

Any hospital patient may obtain a nosocomial infection.

Patients in ***intensive care units have a higher risk*** of developing an infection. According to the 1995 European Prevalence of Infection in Intensive Care Study, *up to 20.6 percent of ICU patients acquire nosocomial infections during or after their stay*.

On average, *nosocomial patients stay in the hospital 2.5 times longer than patients without infection*. Patients with highly compromised immune systems are easily infected. This is because their bodies are not able to control the infections on their own.

Preventing Nosocomial Infections

An estimated 40 percent of nosocomial infections are caused by ***poor hand hygiene*** (WHO). Hospital staff can significantly reduce the number of cases with ***regular hand washing*** and ***environmental health control***. They should also wear protective garments and gloves when working with patients.

Invasive procedures increase the risk of nosocomial infections. Noninvasive procedures are recommended when possible. ***Hospitals are encouraged to put patients with C. difficile, MRSA, VRE, and resistant Gram-negative infections into isolation rooms***. This can lower the risk of other patients becoming infected

Preventing Nosocomial Infections

The use of disinfectants and antibiotics is a vital component of prevention as well.

Source : http://www.healthline.com/health/hospital-acquired-nosocomial-infections#Prevention9

Fact Sheet

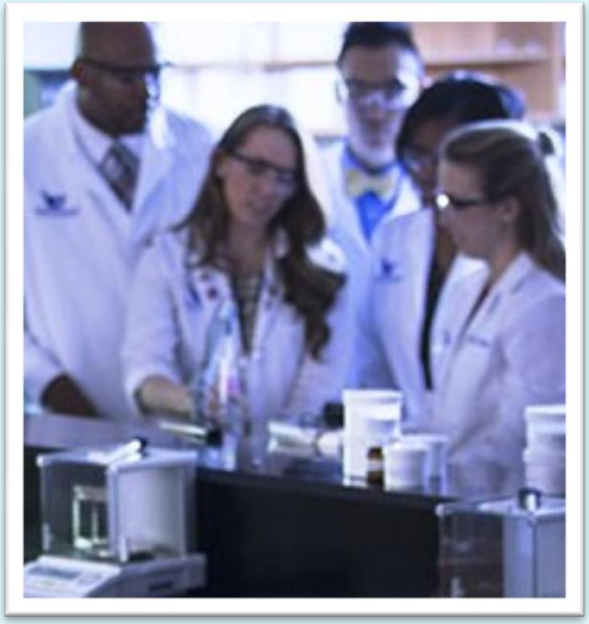
7.1% of all patients contract a Healthcare-associated infection. Due to this 37 000 people die every year as a direct result of nosocomial infection. It generates approximately, according to the ECDC, 16 million extra days of hospital stay at a cost of €7000 000 000 every year – and that is only the cost of health care, not any indirect costs such as loss of income and emotional pain.

The most common infections are Clostridium difficile, Norovirus and the so called multidrug-resistant bacteria MRSA, VRE, ESBL, Pseudomonas and Acinetobacter.

developed products that contain a newly solution for disinfection.
It is a revolutionary, one of a kind, solution that can reduce nosocomial infections.

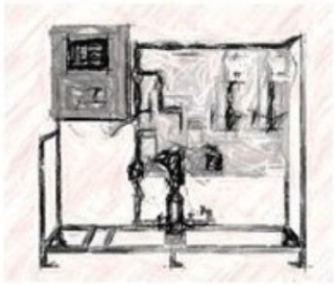
*According to the European Centre for Disease Prevention and Control (ECDC)

A Newly Selection of Disinfectants



Clean vs Dirty

"Stabilized" chlorine dioxide is precursor chemical s mixed together. This creates harmful by-products and very little chlorine dioxide.



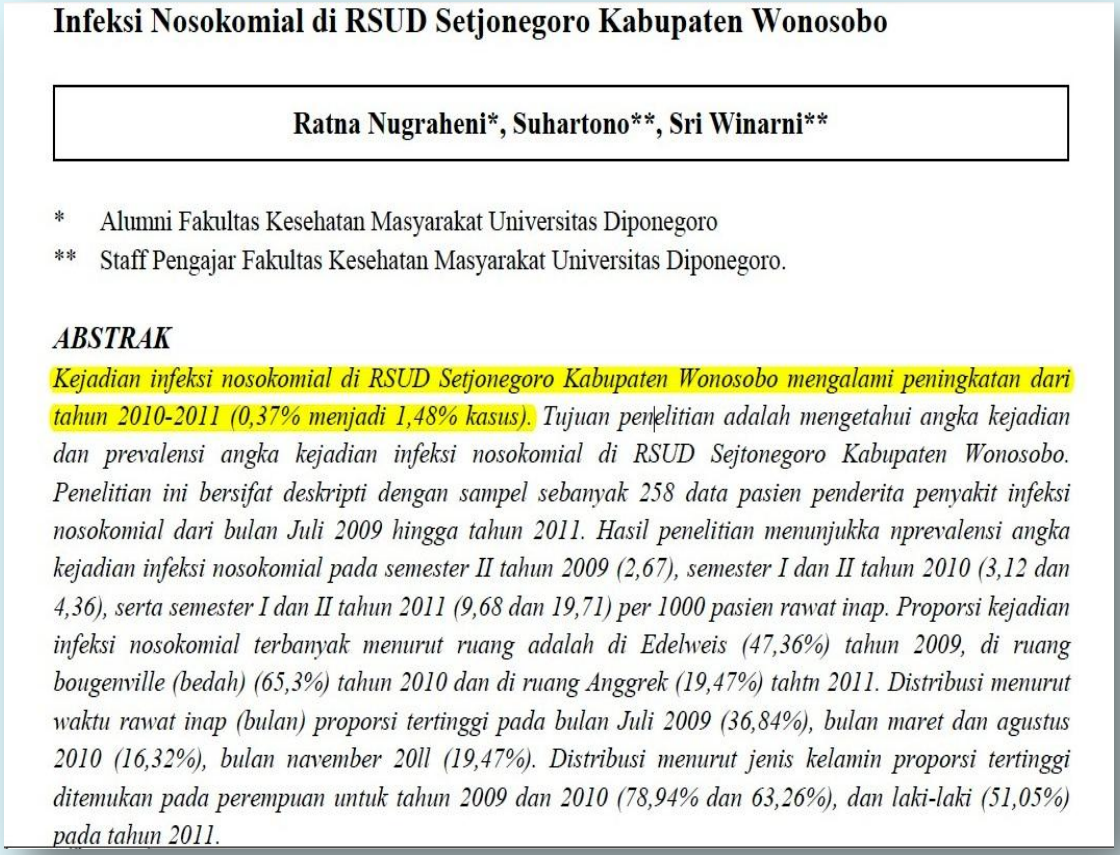
Chlorine dioxide generators make more pure chlorine dioxide, but are expensive and require trained personnel. They are not mobile.

ECO SYS generates ultra pure chlorine dioxide at the point of use. It requires no special training or handling and is portable and safe.

Bagaimana dengan Indonesia?

Berbagai RS di Indonesia baik RS pemerintah maupun swasta belum dapat dipastikan angka infeksi nosokomialnya karena belum adanya sistem pemantauan/survailens yang memadai, sehingga **banyak kasus kejadian infeksi nosokomial belum terpantau/belum dilaporkan pada masing-masing komite Tim Pengendalian Infeksi nosokomial RS**.

Salah satu hasil study yang telah dilakukan adalah sebagaimana artikel berikut :



Infeksi Nosokomial di RSUD Setjonegoro Kabupaten Wonosobo

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* Alumni Fakultas Kesehatan Masyarakat Universitas Diponegoro

** Staff Pengajar Fakultas Kesehatan Masyarakat Universitas Diponegoro.

ABSTRAK

Kejadian infeksi nosokomial di RSUD Setjonegoro Kabupaten Wonosobo mengalami peningkatan dari tahun 2010-2011 (0,37% menjadi 1,48% kasus). Tujuan penelitian adalah mengetahui angka kejadian dan prevalensi angka kejadian infeksi nosokomial di RSUD Sejtonegoro Kabupaten Wonosobo. Penelitian ini bersifat deskripti dengan sampel sebanyak 258 data pasien penderita penyakit infeksi nosokomial dari bulan Juli 2009 hingga tahun 2011. Hasil penelitian menunjukka nprevalensi angka kejadian infeksi nosokomial pada semester II tahun 2009 (2,67), semester I dan II tahun 2010 (3,12 dan 4,36), serta semester I dan II tahun 2011 (9,68 dan 19,71) per 1000 pasien rawat inap. Proporsi kejadian infeksi nosokomial terbanyak menurut ruang adalah di Edelweis (47,36%) tahun 2009, di ruang bougenville (bedah) (65,3%) tahun 2010 dan di ruang Anggrek (19,47%) tahtn 2011. Distribusi menurut waktu rawat inap (bulan) proporsi tertinggi pada bulan Juli 2009 (36,84%), bulan maret dan agustus 2010 (16,32%), bulan navember 20ll (19,47%). Distribusi menurut jenis kelamin proporsi tertinggi ditemukan pada perempuan untuk tahun 2009 dan 2010 (78,94% dan 63,26%), dan laki-laki (51,05%) pada tahun 2011.

What is Chlorine Dioxide (ClO_2)

Chlorine dioxide is an effective biocide at ***concentrations as low as 0.1 ppm*** and over a wide pH range. ClO_2 penetrates the bacteria cell wall and reacts with vital amino acids in the cytoplasm of the cell to kill the organism. The by-product of this reaction is chlorite.

Toxicological studies have shown that the chlorine dioxide *disinfection by-product* (dbp), **chlorite**, poses **no significant adverse risk to human health**.

Read more: http://www.lenntech.com/water-purification-steps-faq.htm#ixzz3PBRiW5mx

History of Chlorine Dioxide (ClO_2)

Chlorine dioxide (ClO2) was discovered in 1811[1]. It's widely used in numerous industries including wood pulp processes, wastewater treatment, and food processing.

Water treatment plants in the United States first used chlorine dioxide in the 1940s for taste and odor control [2].

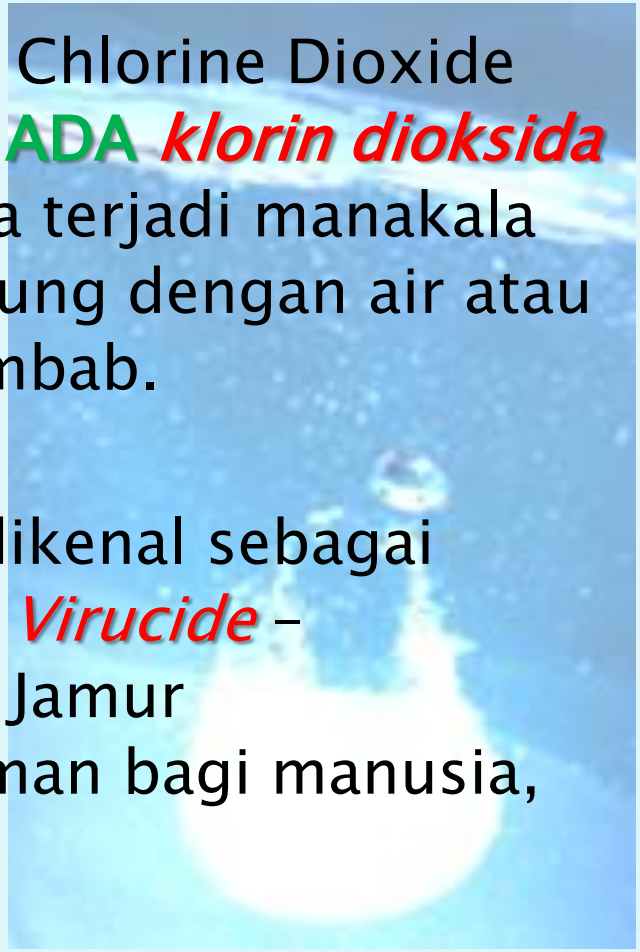
In addition to taste and odor control, ***many drinking water systems*** throughout the world today use chlorine dioxide for disinfection, control of organic disinfection byproducts (e.g., trihalomethanes), and oxidation of iron and manganese.

Reff :

(1) Aieta, E.M., & Berg, J.D., 1986. A Review of Chlorine Dioxide in Drinking Water Treatment. Journal of the American Water Works Association (AWWA), 78(6), 62-72.

(2) Gates, D., 1998. The Chlorine Dioxide Handbook Water Disinfection Series. AWWA, Denver, CO.

Why ECOSYS



Ecosys adalah produk pembangkit Chlorine Dioxide (klorin dioksida). Namun, **TIDAK ADA *klorin dioksida*** dalam produk ini. Klorin dioksida terjadi manakala produk mengalami kontak langsung dengan air atau terpapar sirkulasi udara yang lembab.

Klorin Dioksida (ClO_2) telah lama dikenal sebagai *Bactericide* – pembunuh Bakteri, *Virucide* – pembunuh Virus dan pembunuh Jamur (*Algaecide/Fungicide*), namun aman bagi manusia, hewan dan tumbuhan.

Comparison of Disinfectants

Dilution Instructions - Comparison Ecosys ® and other product

Disinfection of	ECOSYS ®				OTHER PRODUCT			
	Required concentration of available chlorine	Dilution Rates			Required concentration	Dilution Rates		
		1G tablets	4G tablets	20G tablets		0.5g tablets	2.5g tablets	5.0g tablets
Blood Spillaget	800 ppm	8 tablets in 1,0 litre water	2 tablets in 1,0 litre water	1 tablets in 2,5 litre water	10.000 ppm	18 tablets in 0,5 litre water	7 tablets in 1,0 litre water	9 tablets in 2,5 litre water
Pipette Jarst	200 ppm	2 tablets in 1,0 litre water	1 tablets in 2,0 litre water	1 tablets in 10,0 litre water	2.500 ppm	9 tablets in 1,0 litre water	9 tablets in 5,0 litre water	9 tablets in 10,0 litre water
General Laboratory/ Environmental use †	80 ppm	1 tablets in 1,25 litre water	1 tablets in 5,0 litre water	1,0 tablets in 25,0 litre water	1.000 ppm	4 tablets in 1,0 litre water	4 tablets in 5,0 litre water	3,5 tablets in 10,0 litre water

† Howie Code requirements for laboratory use.
‡ A 1% compatible detergent should also be added.

Comparison of Disinfectants

Dilution Instructions - Comparison Ecosys ® and other product

Disinfection of	ECOSYS ®				OTHER PRODUCT			
	Required concentration of available chlorine	Dilution Rates			Required concentration	Dilution Rates		
		1G tablets	4G tablets	20G tablets		0.5g tablets	2.5g tablets	5.0g tablets
Glassware, rubber and plastic tubing	10 ppm	1 tablets in 10,0 litre water	1 tablets in 40,0 litre water	1,0 tablets in 200,0 litre water	140 ppm	1 tablets in 2,0 litre water	1 tablets in 10,0 litre water	1,0 tablets in 20,0 litre water
Solid linen	10 ppm	1 tablets in 10,0 litre water	1 tablets in 40,0 litre water	1,0 tablets in 200,0 litre water	140 ppm	1 tablets in 2,0 litre water	1 tablets in 10,0 litre water	1,0 tablets in 20,0 litre water
Work surfaces, cupboards, floors, etc.	10 ppm	1 tablets in 10,0 litre water	1 tablets in 40,0 litre water	1,0 tablets in 200,0 litre water	140 ppm	1 tablets in 2,0 litre water	1 tablets in 10,0 litre water	1,0 tablets in 20,0 litre water

Kelebihan Chlorine Dioxide dibanding bahan aktif lainnya

RESEARCH

Comparison of chlorine dioxide and dichloroisocyanurate disinfectants for use in the dental setting

SADJ August 2012, Vol 67 no 7 p364 - p368

M Patel[1], J Ebonwu[2], E Cutler[3]

isms,[18-19] they are considered an intermediate level disinfectant because they have low sporicidal activity, are relatively unstable and their activity is dependent on pH.[20] Demand-release chlorine compounds, such as the chlorine dioxide tested in this study, were developed because chorine is then retained longer, exerting a more prolonged bactericidal effect and the compound is stable. Chlorine dioxide is also more rapidly effective against microorganisms than is chlorine.[21] In this study both disinfectants were shown to exhibit good sporicidal properties and could therefore be used as for intermediate to high level disinfection of semi-critical and non-critical instruments such as dental mouth mirrors, amalgam condenser, reusable impression trays, dental handpieces, radiographic head cone and radiographic films[22] and as a sterilant for semi-critical heat sensitive instruments. Chlorine dioxide has an additional advantage because it is non-corrosive as claimed by the manufacturer and effective disinfection is achieved at low concentrations. Products containing chlorine dioxide concentrations of 150 to 1100ppm have shown antimicrobial and sporicidal activity.[13,21,23] However our results showed that even at 24ppm chlorine dioxide exerts an antimicrobial effect including activity against spores, HBV and mycobacteria.

In the dental surgery chlorine dioxide can be used as a pre-soaking solution for dirty instruments and for the decontamination of radiographic films before processing.

CONCLUSIONS

In conclusion this study has shown that a non-corrosive slow release chlorine dioxide and chlorine releasing sodium dichloroisocyanurate disinfectants are microbiocidal after 30 seconds exposure and sporicidal after two to three minutes in the presence of organic material. Both the disinfectant solutions were effective for 27 to 37 days if stored in screw cap bottles. They have the potential to be used in the dental setting as a surface disinfectant and a sterilant for semi-critical heat sensitive instruments. Chlorine dioxide has an additional advantage because it is non-corrosive and the effective concentration is much lower than that required for sodium dichloroisocyanurate.

Clinical significance

Chlorine dioxide has a broad-spectrum antimicrobial property and therefore it can be used in the dental settings for surfaces and heat sensitive instruments as a sterilant.

Acknowledgements

We thank the National Health Laboratory Services for the financial support and Waylor Trading and Logistics cc, South Africa for providing the chlorine dioxide disinfectant.

Declaration: No conflict of interest declared

References

1. Merritt K, Hitchins VM, Brown SA. Safety and cleaning of medi-

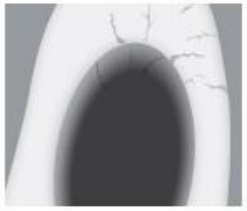
CARA KERJA

How does ECOSYS work on Clostridium difficile?

Clostridium difficile is an anaerobe, spore creating, intestinal bacteria that may cause mild diarrhea (CDI) as life threatening inflammation on the large intestine. The primary risk group is elderly patients that are treated with antibiotics. Clostridium difficile is one of the toughest spores to kill, since the bacterium is protected by an extremely resilient spore wall (image 1).

It has been noted during repeated scientific testing that when the Clostridium difficile spore comes into contact with Ecosys, the walls of the spore are immediately made thinner by the formula. Within seconds the spore wall begins to burst (image 2), which causes the formula to enter the spore and generates a chemical reaction that stops the bacteria's ability to grow. When the spore wall has been penetrated by the formula the spore is eliminated by conventional techniques, through the chloride dioxide based gas that kills the bacteria (image 3). All this takes place within 60 seconds.

1. Clostridium difficile's tough spore wall protects the bacteria against e.g. other solutions for surface sanitation available on the market



2. During contact with Ecosys the spore walls are made thinner immediately, which allows the formula to enter, and thus the killing process has begun.

3. The bacterium dies within 60 seconds because of the chlorine dioxide gas of Ecosys.

Lokasi yang perlu mendapatkan perlindungan

Treatment Rooms

Termasuk :

- Ruang IGD;
- Ruang Tunggu Keluarga/Resepsionis;
- Ruang Perawatan; dan
- Poliklinik

adalah daerah yang rentan terhadap penyebaran/penularan infeksi nosokomial.

Cara Desinfeksi :

1. Penggunaan Ecosys tablet dalam larutan pengepelan dengan dosis 50 ppm (*shock treatment*) atau 10 ppm (*daily treatment*) dapat mengurangi risiko terjangkit inos secara signifikan.

2. Penggunaan *Wall Mounted Air Disinfection Machine*.

Model: 209A
Charge voltage: 110V/60Hz or 220V/50Hz
Operating voltage: 12V
Rated Power: <25W
Static power: 0.1W
Noise: <45 (dB)
Shell material: plastic
Concentration: 0.1ppm
Application area: 10 ~ 150 (m)
Purification rate: 99.99 (%)
Operating temperature: 0-40 ° C
Product size: 315 * 186 * 512 (mm)
Outer packing: color box packing
Carton size: 415 * 285 * 685 (mm)
Gross weight: 11KG
Net weight: 9.8KG
Packing: 1 set
Country of Origin: Shenzhen, Guangdong

3. Penggunaan *Small Portable Decorative Air Disinfection Machine*.

Operating Room

Menggunakan Mounted Wall Air Disinfection Machine, Small Portable Decorative Air Disinfection Machine dosis 0,1 ppm, dan

Pembersihan lantai dan dinding dengan larutan **Ecosys** 50 – 80 ppm (*shock treatment*) or 10 ppm (*daily treatment*).

Kitchen

Dapat menggunakan Mounted Wall Air Disinfection Machine, Small Portable Decorative Air Disinfection Machine 0,1 ppm.

Pembersihan lantai dan dinding dengan larutan **Ecosys** 50 ppm (*shock treatment*) or 10 ppm (*daily treatment*).

Pencucian dan pembilasan peralatan dapur dengan sprayer larutan **Ecosys** 10 – 50 ppm (sesuai kebutuhan)

Laundry

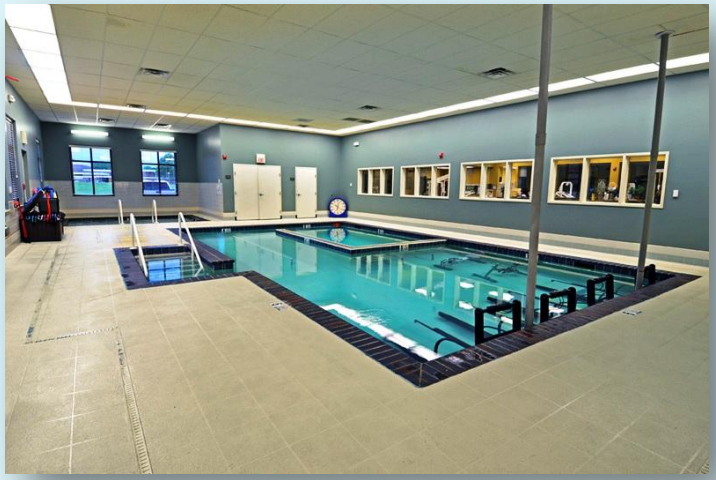
- Pembersihan lantai dan dinding dengan larutan **Ecosys** 50 ppm (*shock treatment*) or 10 ppm (*daily treatment*), dan
- Penggunaan air bersih dengan larutan Ecosys 1 – 10 ppm untuk menjaga hygienis pakaian, sprei dll.

Laboratory & Pharmacy

- Menggunakan *Mounted Wall Air Disinfection Machine*, *Small Portable Decorative Air Disinfection Machine* dosis 0,1 ppm,
- Pembersihan lantai dan dinding dengan larutan **Ecosys** 50 ppm (*shock treatment*) or 10 ppm (*daily treatment*), dan
- Penggunaan Air Disinfection Sachet 20G dan 40G.

Therapeutic and physiotherapy room

- Menggunakan Mounted Wall Air Disinfection Machine, Small Portable Decorative Air Disinfection Machine,
- Pembersihan lantai dan dinding dengan larutan **Ecosys** 50 ppm (*shock treatment*) or 10 ppm (*daily treatment*), , dan
- Penggunaan Air Disinfection Sachet 20G dan 40G.



Water Supply and Treatment Systems

Because groundwater throughout Jakarta (and other major cities) is severely polluted, water quality is an important concern in all households, expatriate and Indonesian. It has been stated that up to 80% of groundwater in Jakarta is polluted with pathogenic, disease causing bacteria, such as e-coli. It's highly advisable to drink boiled or bottled water during your stay in Indonesia due to the prevelance of water borne diseases.

Source :
http://www.expat.or.id/info/watertreatment.html

Fact Sheet

Vol. 24 No. 8 INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY 575

A 17-MONTH EVALUATION OF A CHLORINE DIOXIDE WATER TREATMENT SYSTEM TO CONTROL *LEGIONELLA* SPECIES IN A HOSPITAL WATER SUPPLY

Arjun Srinivasan, MD; Gregory Bova; Tracy Ross, BSN; Karen Mackie, RN, CIC; Nicholas Paquette, BS; William Merz, PhD; Trish M. Perl, MD, MSc

ABSTRACT

OBJECTIVE: To assess the safety and efficacy of a chlorine dioxide water treatment system in controlling *Legionella* in a hospital water supply.

DESIGN: For 17 months following installation of the system, we performed regular water cultures throughout the building, assessed chlorine dioxide and chlorite levels, and monitored metal corrosion.

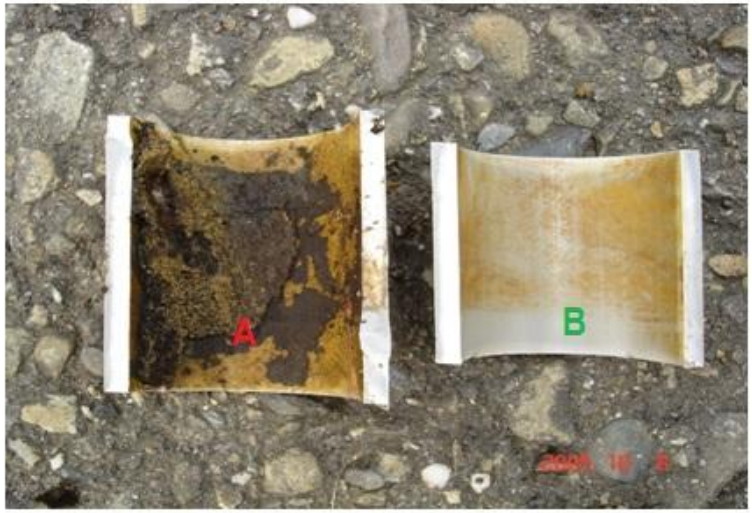
RESULTS: Sites that grew *Legionella* species decreased from 41% at baseline to 4% (P = .001). *L. anisa* was the only species recovered and it was found in samples of both hot and cold water. Levels of chlorine dioxide and chlorite were below Environmental Protection Agency (EPA) limits for these chemicals in potable water. Further, enhanced carbon filtration effectively removed the chemicals, even at chlorine dioxide levels of more than twice what was used to treat the water. After 9 months, corrosion of copper test strips exposed to the chlorine dioxide was not higher than that of control strips. During the evaluation period, there were no cases of nosocomial *Legionella* in the building with the system, whereas there was one case in another building.

CONCLUSIONS: Our results indicate that operation of a chlorine dioxide system effectively removed *Legionella* species from a hospital water supply. Furthermore, we found that the system was safe, as levels of chlorine dioxide and chlorite were below EPA limits. The system did not appear to cause increased corrosion of copper pipes. Our results indicate that chlorine dioxide may hold promise as a solution to the problem of *Legionella* contamination of hospital water supplies (*Infect Control Hosp Epidemiol* 2003;24:575-579).

Other Application

REMOVING BIOFILM

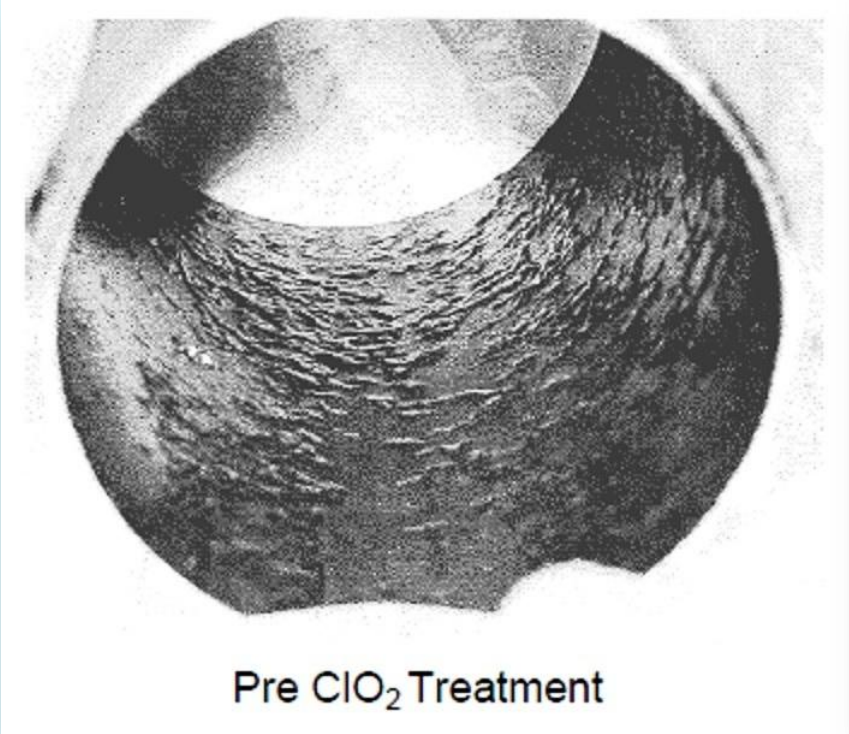
Membersihkan bagian dalam pipa dan keran air dari biofilm dan lendir serta potensi pencemaran oleh bakteri.



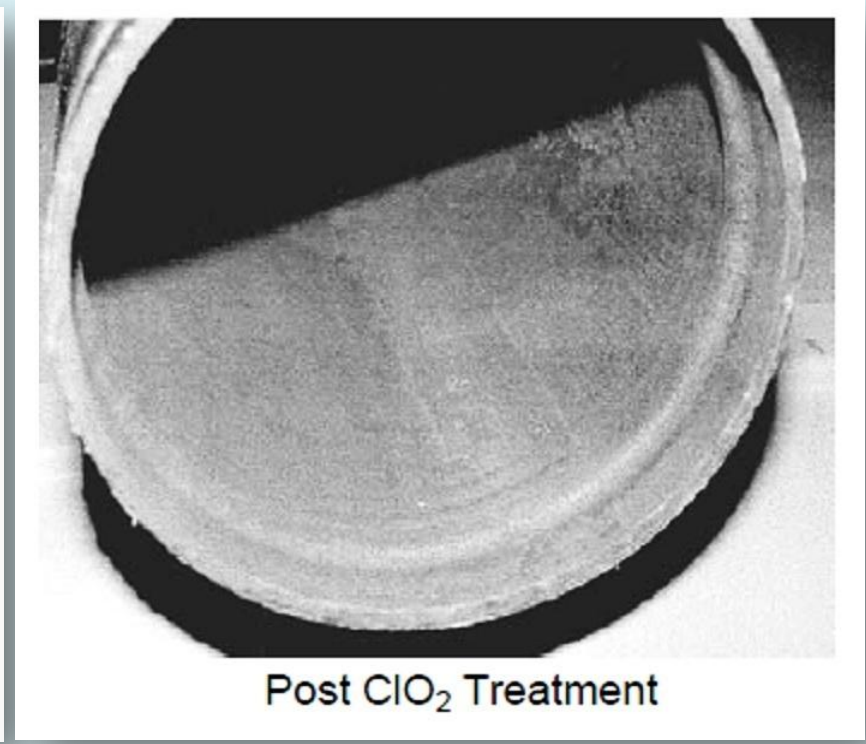
Sebelum (A) dan setelah pemakaian Ecosys (B)

Other Application

REMOVING BIOFILM



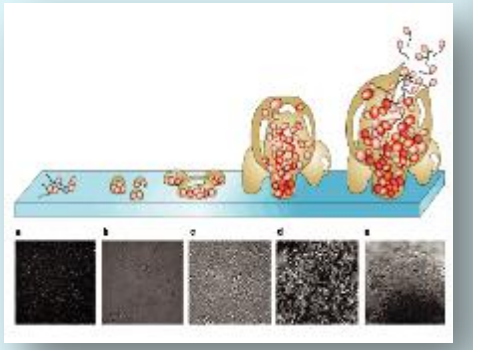
Pre ClO_2 Treatment



Post ClO_2 Treatment

Other Application

REMOVING BIOFILM



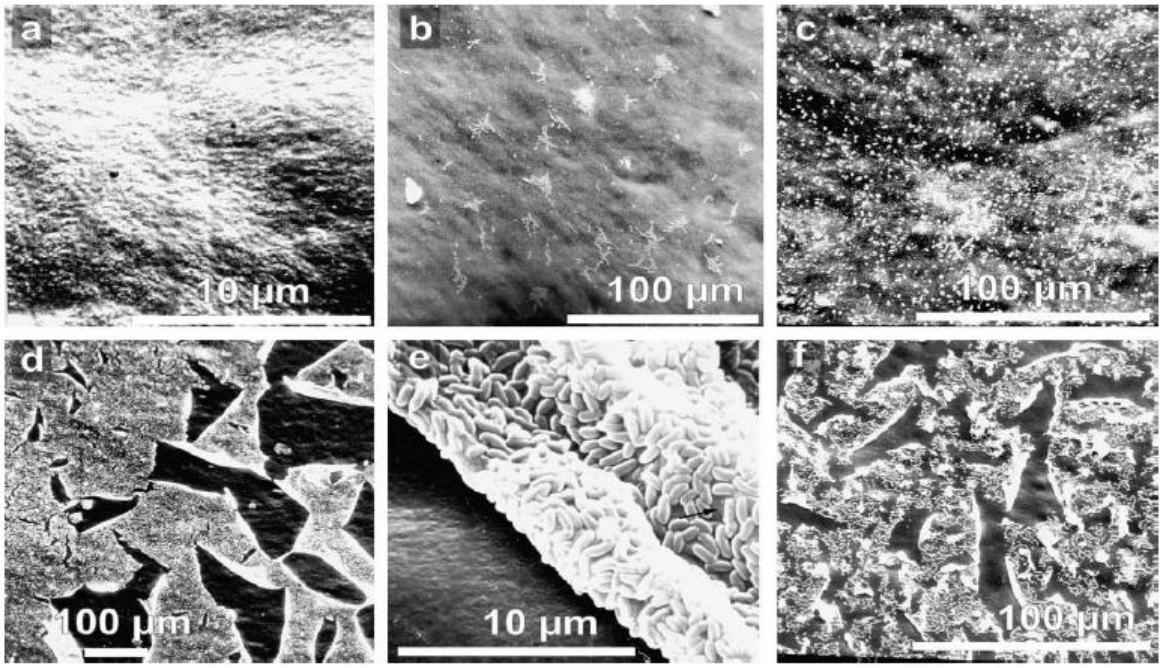


Fig 1. Induction of a biofilm by running drinking water through a silicone tube (inner tube diameter 4 mm). **a**, Inner surface of the control tube without biofilm. **b**, Microcolonies appear after running drinking water for 2 days. **c**, Numerous microcolonies appear after running drinking water for 4 days. **d**, Surface covered with biofilm (disrupted by preparation) after running drinking water for 7 days. **e**, Magnification of **d**. Numerous microorganisms embedded in an extracellular matrix *(arrow)*. **f**, Surface covered with biofilm after running drinking water for 15 days.[12]

Conclusion

In the normal course of operation, hospitals generate a variety of waste products which are not suitable for normal disposal. While some or most hospital waste may be harmless, it is difficult to distinguish such harmless waste from infectious waste. As a result, all of the waste from a hospital must be treated as if it is harmful.

Because of its biocidal characteristics Ecosys is ideal for water hygiene applications in hospitals and healthcare facilities. It has consistently been shown to be the best molecule for eradicating the causative organism of Legionnaires' disease (Legionella). Ecosys is strong biocide even at concentrations as low as 0.1ppm. With minimal contact time, it is highly effective against many pathogenic organisms, including Legionella, Giardia cysts, E. coli, and Cryptosporidium.

Ecosys also greatly reduces and eliminates bio-film populations and discourages bacterial regrowth.

About Us

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PT. Clordio Optima

Our Clients

- Perusahaan Makanan dan Minuman

  PT. Mulia Boga Raya (Keju PROCHIZ®), Sungai Budi Group.

- Perusahaan Air Minum

  PT. TOYOTEX (Swasta)

- Perusahaan Air Minum Dalam Kemasan

  PT. Selaras Citra Jaya

- Dokter Hewan

  Drh. M. Munawaroh (Bekasi) – *Rebranding*

- Kolam Renang

  Graha Tirta Siliwangi, Fajar Panorama Bdg, etc.

Our Products

ECOSYS- TABLET 20G :

Menghasilkan 1 ppm chlorine dioxide dalam 2.000 Liter air

ECOSYS- TABLET 4G :

Menghasilkan 1 ppm chlorine dioxide dalam 400 Liter air

ECOSYS- TABLET 1G :

Menghasilkan 1 ppm chlorine dioxide dalam 100 Liter air

ECOSYS- POWDER MIXED (1 KG):

Menghasilkan 1.000 ppm chlorine dioxide dalam 100 Liter air

ECOSYS- POWDER A + B (2 KG):

Menghasilkan 2.000 ppm chlorine dioxide dalam 100 Liter air

Our Products

TERIMA KASIH