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Company Introduction

DG Investments, Inc.

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- **Introduction**

- Most companies today seek to perform all operations with the highest competitiveness. This has come to be a very interesting part to rethink strategies and redouble efforts.
- DG Investments, Inc. in an effort to achieve their objectives and goals in the short, medium and long term, developed a business plan that is directly aimed at launching innovative products developed with nanotechnology for the health industry as described below.
- This document is to define the business intended to achieve objectives, strategies and also the actions to be implemented to achieve those objectives will be established.
- This document required a prior process of study, reflection and decision making that will be further discussed.

Company Introduction

DG Investments, Inc.

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Company

- DG Investments, Inc. started in April 2010 in the USA with the purpose of giving reservation to the needs of the global market with governments and the private sector, whose business is established in the production , purchase, sale and distribution of various high-tech products with technology that produce and emit far infrared and negative ions applied in surgical dressings, menstrual pads, prophylactic pads , treatment materials , bandages , patch for menstrual cramps , diapers for newborns and adults as well as in disposable surgical material.
- Since 2000 and derived from a research event in infections of surgical wounds contaminated as well as complications in diabetic foot ulcers and recurrent urinary diseases, after a long process and a visionary look DG Investments, Inc. became a manufacture company which continues to date with a corporate office in the city of Anaheim CA , USA .
- Since 2010 DG Investments, Inc. embarks on an aggressive strategy for local and foreign trade for the sole purpose of providing our customers differentiated products with high technology and innovation for health.
- The Blum recorded with surgical dressing brand, the sanitary napkin and pad for dysmenorrhea with negative ion band whose bactericidal and anti microbial motivated to propose to the official authorities of public health research protocol scientific research with experts and professionals health .

Company Introduction

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Mission

- Being a leader in the manufacture, sale and distribution of products of the highest quality company, always looking to exceed the expectations of our consumers and trade partners, strengthening the efficiency and technology in manufacturing processes by implementing continuous improvement programs aimed at increasing competitiveness of our company recognizing the value of our employees and fostering a spirit of teamwork and passion for service.

View

- Fully develop our business areas, reaching our goal by consolidating DG Investments, Inc. as a world-class company

General Aspects

DG Investments, Inc.

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DG Investments, Inc. is a market leader in medical products, textiles, dressing abdominal pads, feminine pads, gauze, diapers.

General Aspects

Sanitary pads are staples and obligatory for all women, and will use that for more than 40 years of their life . 80 % of women worldwide suffer from some form of intimate problem and 63% of these problems are caused by poor quality sanitary napkins , many contaminated with chemical residues. Data from the World Health Organization (WHO), 1992 .

Moreover, laboratory analysis assisted by WHO has shown that about 87 % of the pads that have been used for four continuous hours , contain more than 107 bacteria per cm ² on its surface ; These results were so disturbing that many governments have regulated and quality control procedures , however, many of these problems still continue.

Years of research have resulted in an evolution in higher quality and prophylaxis of our female sanitary towels, a product with basic concepts related to the major brands of towels. Feminine design on the world market , but with effects and higher quality product that has revolutionized the world market for its excellent results due to their large therapeutic ranges , improving health and wellbeing in women genitourinary .

Product Line

Product Line

The product line "Blum" is designed using nanotechnology and developing a whole platform of scientific research.

The Sterile Surgical dressing and pads that form a set of pads that function in a manner similar to conventional, are marketed through the same type of channel, sold to the same type of consumer.

Sterile Surgical Dressing Pads

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The bacterium Staphylococcus aureus

- The bacterium Staphylococcus aureus is the leading cause of surgical site infections (SSI) in the United States. In particular, Staphylococcus aureus, antibiotic-resistant (MRSA) has become a devastating complication, leading to an increase in mortality rates, increase the duration of hospitalization, and increased costs. Tested for SSI prevention strategies caused by S. aureus include addressing modifiable risk factors and the choice and timing of antimicrobial prophylaxis correctly and using the Sterile Surgical Dressing Blum.

Female Pads

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- **Product Description**
- **Blum PADS**

- **Blum is the new generation of prophylactic pads , developed with high technology based on negative ions and far infrared . It is the only female towel that helps promote health and has proven to be an effective adjunct in the management of certain bacterial infections, contact dermatitis, viral processes , fungi , odor , irritation, itching and inflammation. It improves micro circulation , the immune system and balances the hormonal system and the vaginal pH.**

- **It's tape emits anion ↑ 6190 / cm ^{3} negative ions to effectively inhibit the survival and proliferation of bacteria , fungi and viruses, which are the main causes of female problems. Many intimate infectious processes are caused by anaerobic bacteria (which do not need air to live) . The anionic tape Blum sanitary napkins emits a high density of anions generated by ionized oxygen making it impossible for promoting anaerobic biological life and enzyme conversion .**

Female Pads

DG Investments, Inc.

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Under normal temperature, the anion may emit magnetic wave band ranging from 4 to 14 microns, more than 90% of the rate of emission beneficial to the human body because it activates water molecules in the cells by filling them with a high energy level. This is a purely physical process that achieves anti-inflammatory, antibacterial and deodorant functions, improving the quality of life for women and their health care through technology.

{BLÜM}

Patch For Menstrual Cramps

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Blum Patch

Menstrual cramps (dysmenorrhea) are quite common , in fact more than half of menstruating women have pain during the first days of their period.

Doctors say a chemical called prostaglandin causes the contraction of the muscles of the uterus.

There are a variety of drugs, such as ibuprofen or acetaminophen , to relieve these pains , but they are still drug contraindications and disadvantages for use in excess.

Why heat Blum Patch relieves menstrual pain ?

Heat to more than 50 ℃ , increases blood flow and relaxes

contracted muscles , has a relaxing effect and also blocks

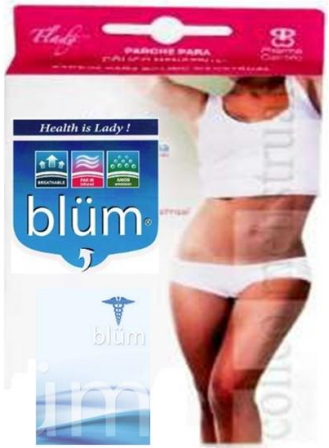
transmission of pain signals to the brain .

For pain during menstruation , heat relaxes the muscles of the uterus and thus relieves pain during the first days of the period.

Blum Patch is an innovative high-tech product that uses the energy composition of volcanic rocks Alpine, whose material emits infrared energy. Contains activated carbon and a combination of selected natural herbs.

Benefits

Assist in the management of menstrual cramps (dysmenorrhea). "Blum" Thermal Patch is specifically designed for the pain of menstrual cramps, is a comfortable, practical and effective alternative for the modern woman.



BENEFITS

DG Investments, Inc.

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Benefits

Blum dressing fitness for repair

It emits far infrared ray.
Emits negative ions.
It helps remove infections.
Maintains the pH balance of the skin.
Maintains drier wound.
Thickness decreases scarring.

Blum Feminine Pads has the following benefits:

Relieves inflammations.
Eliminates odors.
Improves metabolism.
Eliminates the growth of pathogenic bacteria.
Strengthens the immune system.
Removes and prevents breakouts.
It can also prevent urinary tract infections (UTI)
and gradually eliminate dysmenorrhea (painful menstruation).

Channels of Distribution

- Pharmacies and Supermarkets
- Using a distribution channel through pharmacies and super markets are used as strategy and competitive advantage , as the Blum product is a satisfier of a basic necessity also providing value-added benefits addressing specific needs which may be recommended by a vendor or a user who before had a satisfactory experience with the product.
- Distribution Channels
- Blum is intended to choose a suitable distribution channel to have an aggressive brand penetration , trying to always be present in our end consumers , taking the availability of the product in the right quantities , at the right time and at the most affordable prices for both .
- Indirect channels of distribution are determined through a strategic alliance with Medline which is a company highly specialized in the distribution and marketing of products with global presence.

Consumer Market

Analyzing Consumer Markets and Consumer Buyer Behavior

Research Protocols

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- Research Protocols
- In order to scientifically substantiate the therapeutic properties and mechanisms of action of the band of negative ions used in surgical dressings and sanitary napkins has worked together with the medical community in North America for the sole purpose of differentiating Blum as a device medical certificate and endorsed by the scientific community and avoiding the tendency to classify as a miracle product made only on the basis of false marketing because in science that can not be verified and will not replicate an ethical product.
- CIATEQ Protocol
- "Evaluation of the electrical and structural properties of the Tourmaline materials with potential applications in polymer composites Nano ." (Annex 1)
- Protocol General Hospital IMSS Baja & Sonora Delegation .
- "Effect of application of tourmaline side dressings in diabetic foot lesions ." (Annex 2)
- City of Obregon and Hermosillo , Sonora : Lunch out the studio where he took
- " Estimation of the characteristics of women using the Blum towels in women of reproductive age.

Tariff Tariff

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Tariff Tariff

Blum DRESSING

Fraction No. _____

Tax by country + Customs + Import Charges

Blum TOWEL

Fraction No. _____

Tax by country + Customs + Import Charges

Blum PATCH

Fraction No. _____

Tax by country + Customs + Import Charges

Legal Aspects

After approval of the project will formalize
a contract in which conditions are the subject of the purchase - sale for brand Blum.

DG Investments Inc.

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Tel.: 1-800 640-BLUM-2586

Fax: 1-800 640-2592

www.medblum.com

Medical Research

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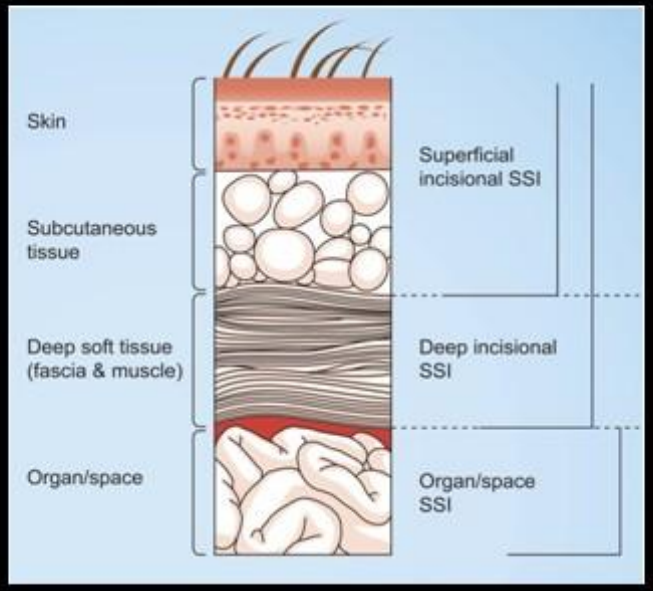
TODAY'S WOUND CARE TREATMENTS

Wound care professionals face many challenges and variety of products and medical textiles (dressings), but few of them with Continuous Antimicrobial Protection. That's why Blüm® offers an innovative technology "Antibacterial Dressing" for successful wound care and Surgical Site Infections comprising a complete and cost effective solution. Throughout this information, you will find the basis of product testing, information and resources.

Surgical Site Infection (SSI)



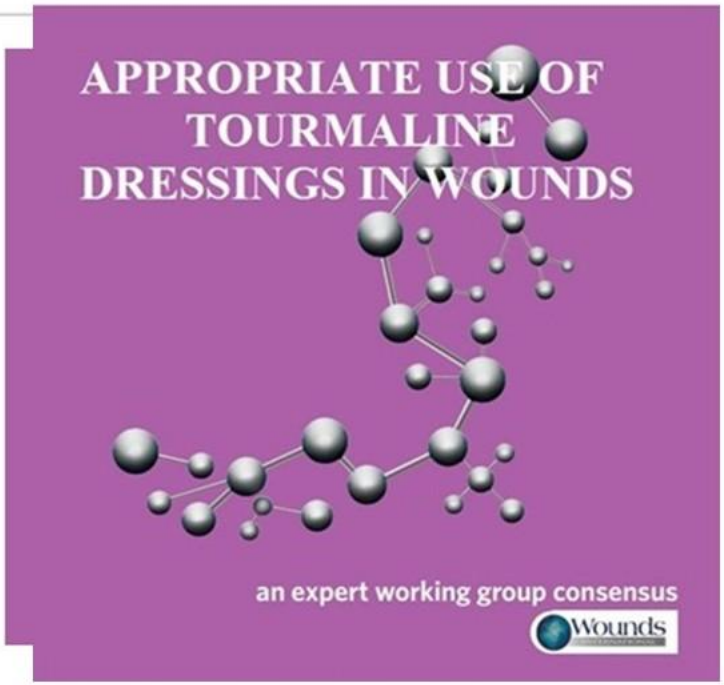
Sterile Dressing with Antimicrobial Tourmaline Band

Disposable Surgical Line

MD. Jose Zavala
Research Medical Director
Medblüm & Blüm®

INTERNATIONAL CONSENSUS

Advanced Medical Innovations




Surgical Site
Infection (SSI)

Risk factors for patients and best practices for Prevention of Surgical Site Infection (SSI)

Definitions

Infections that occur in a wound created by a surgical procedure are generally known as invasive surgical site infection because the skin is normally colonized by a number of microorganisms that can cause infection.

The incidence of surgical site infections (SSI) continues unacceptably high and will result in an increase of $ 10 billion in costs each year and many of these can be prevented. Compared with a patient not infected, the patient with an SSI:

- ✓Remains hospitalized seven days longer;
- ✓There are 60% more likely to spend more time in the ICU;
- ✓Has 5 times more likely to be readmitted within 30 days after the register;
- ✓ It is twice as likely to die.

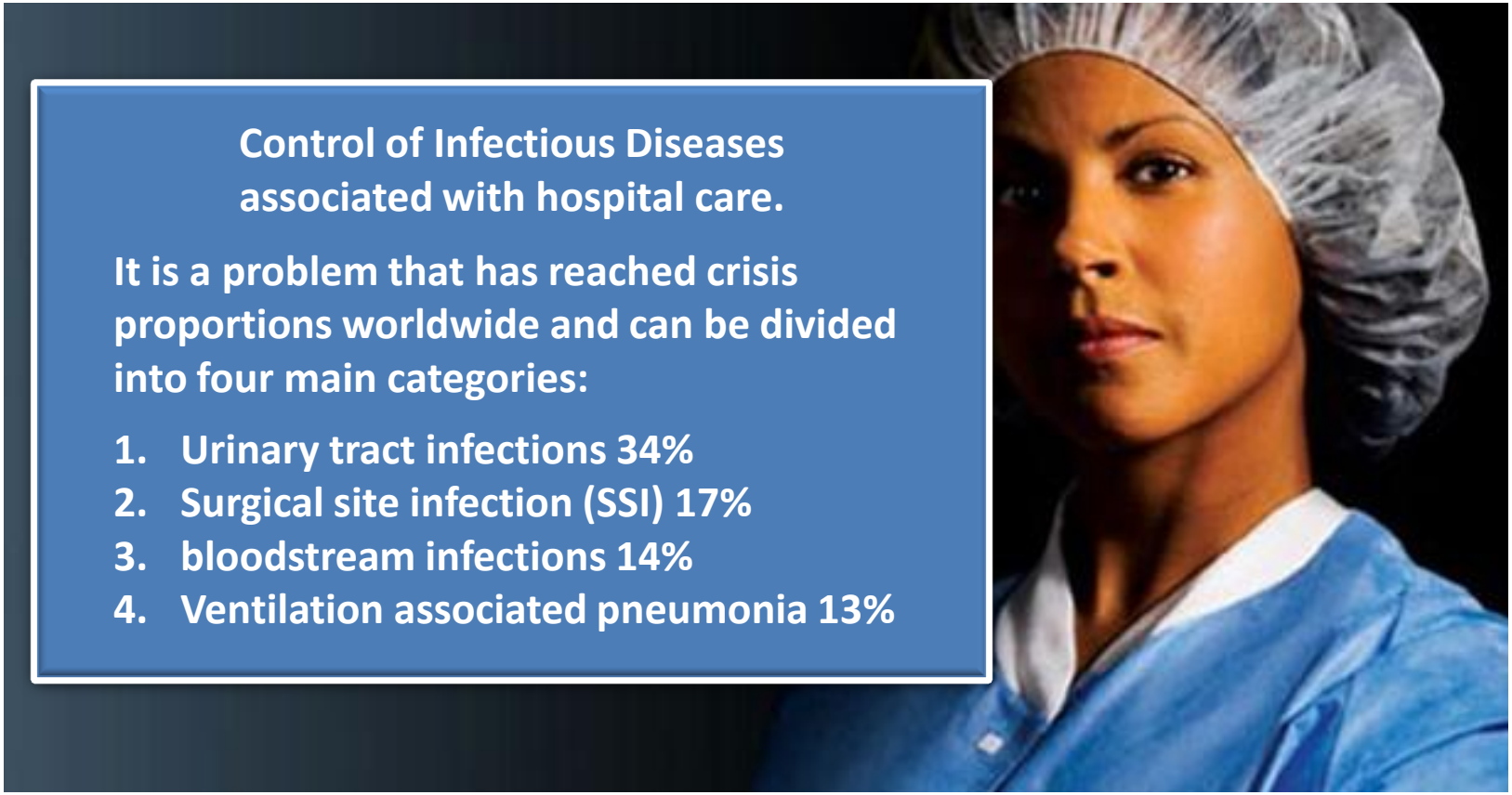
introduction

- introduction
- Despite considerable research on best practices and strides in refining surgical techniques, technological advances and environmental improvements in the operating room (OR), and the use of prophylactic preoperative antibiotics, infection at the surgical site remains the second most common adverse event occurring to hospitalized patients and a major source of morbidity following surgical procedures.1,2 Currently there are more than 40 million inpatient and 31 million outpatient surgeries performed each year in the United States, with at least 2% of these patients, or approximately 1.4 million, developing a surgical site infection (SSI) of varying severity.3 A comparison study from Duke University conducted in 1999 estimated that a SSI doubled the patient's risk of death after surgery from 3.5% to 7.8%, increased the likelihood of an ICU stay from 18% to 29%, added 5 days to the hospital stay, doubled the cost of hospitalization from $3,844 to $7,531, and increased the probability of readmission from 7% to 41%.4 More recent data published in November 2006 by the Pennsylvania Health Care Cost Containment Council (PHC4) revealed the astronomical increases in cost of American healthcare since then. The PHC4 reported that a commercial insurance payment for a patient with a SSI was $27,470, or 70%, greater than a case without an infection; and the actual charge for the care of patients with SSI was much higher still: $132,110 compared to $31,389 for no infected patients.5 However high the monetary cost to the healthcare system, the cost to the patient in terms of pain, suffering or loss of life has always been too much.

Healthcare Associated Infections: The Unknown Killer

Healthcare Associated Infections (HAIs) affect millions of people and add billions of dollars to healthcare costs in the U.S. annually. HAIs are an unintended consequence of care delivered by healthcare organizations. Scientific evidence suggests that most HAIs are preventable.

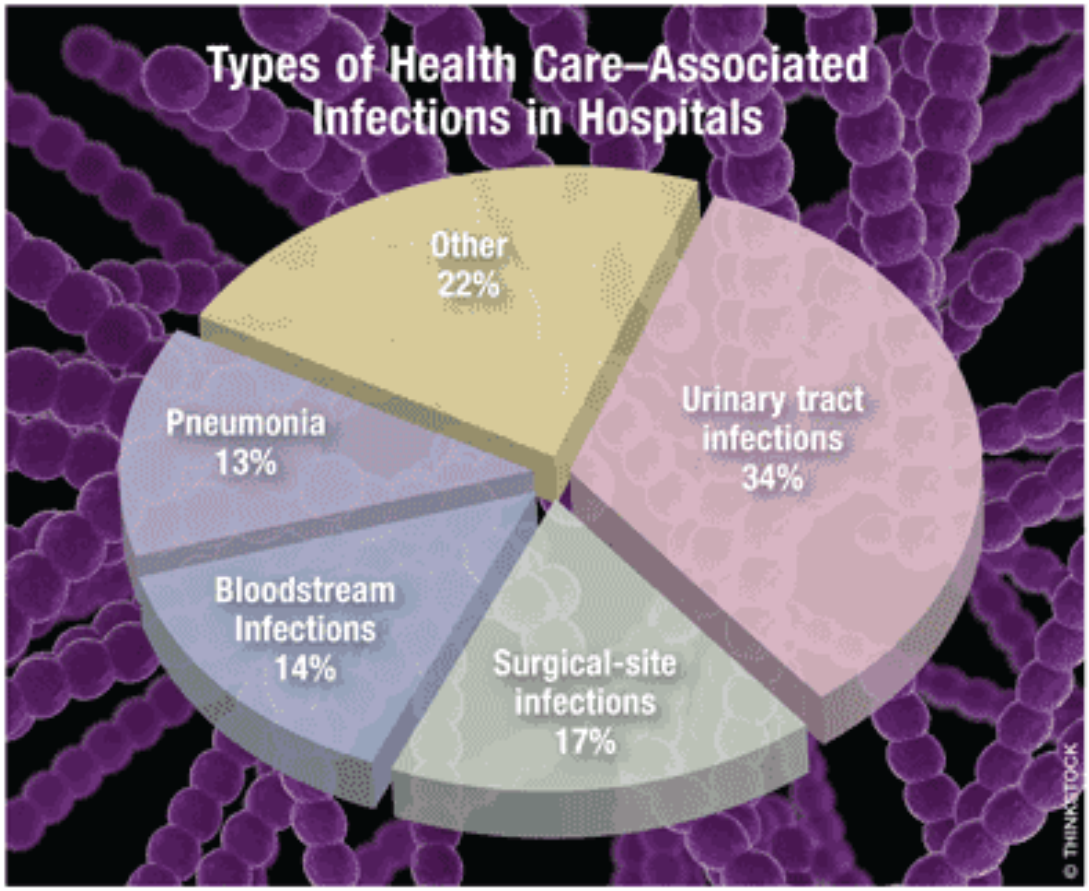
Committee on control and prevention of nosocomial infections



Control of Infectious Diseases associated with hospital care.

It is a problem that has reached crisis proportions worldwide and can be divided into four main categories:

1. **Urinary tract infections 34%**
2. **Surgical site infection (SSI) 17%**
3. **bloodstream infections 14%**
4. **Ventilation associated pneumonia 13%**



THE COST: $10 BILLION AND 43,000 DEATHS, ALL PREVENTABLE.

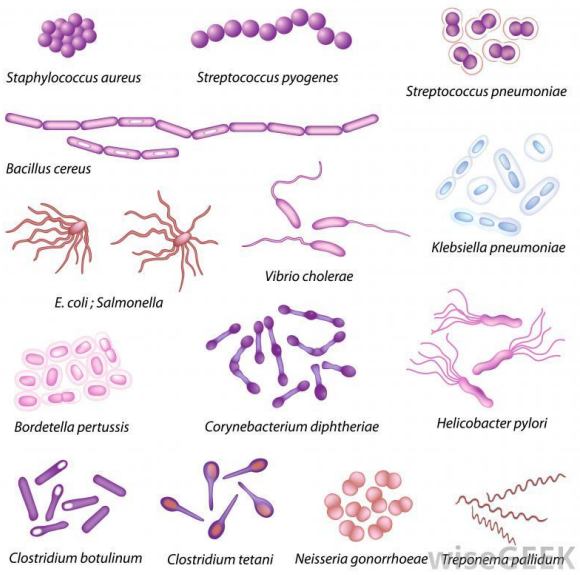

Surgical Infections
£1.53
million.
COST
AVOIDED
by REDUCING INFECTIONS
at Robert Wood Johnson
University Hospital
New Brunswick, United States
*Based on a conversion rate of 1 GBP = 1.5472 USD

Patient-Related Risk Factors for Surgical Site Infection

- There are numerous patient-related (endogenous) and process/procedural related (exogenous) variables that affect a patient's risk of developing an SSI. Some variables, such as age and gender, are obviously not amenable to change or improvement. Fortunately, however, a number of other potential factors, such as nutritional status, smoking, proper use of antibiotics and intraoperative technique, can be improved to bolster the likelihood of a positive surgical outcome.

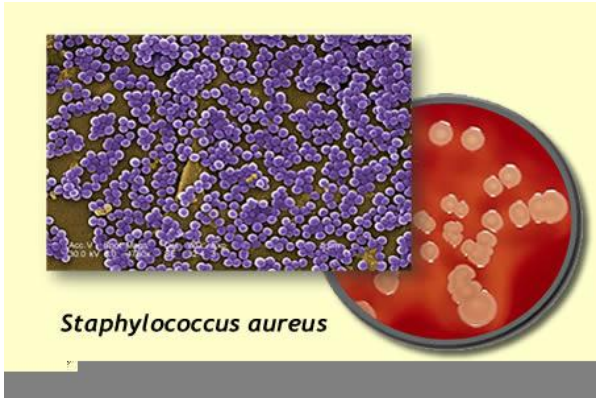
The remainder of this review will focus on the risk factors related to the patient and the importance of the textile industry in the production of disposable surgical products especially the pH of dressings that are central topic. Some of the risk factors most commonly identified to acquire patient surgical site infection include pre-existing diabetes and / or perioperative hyperglycemia, obesity or malnutrition preexisting infection from a remote site in the body, recent use of snuff, contaminated or dirty wound , colonization by microorganisms, and peri-operative hypothermia. With preparation, planning and methodical execution, it can tackle and minimize risk factors.

Colonization with Microorganisms



The primary source of infection for most surgical sites is the patient's endogenous microorganisms. All patients are colonized with bacteria, fungi and viruses—up to 3 million germs per square centimeter of skin.36 However, not all patients, bacteria, fungi and viruses are created equal. Patients with a history of diabetes mellitus DM), chronic obstructive pulmonary disease (COPD) necessitating long-term steroid use, or other chronic illness who have had repeated hospitalizations and/or courses of antibiotics tend to be more heavily colonized with bacteria, especially with antibiotic-resistant bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA). All surgical wounds will be contaminated with bacteria during surgery, but only a small percentage becomes infected.10 This is because most patients' host defenses are capable of controlling and eliminating the offending organisms when the wound inoculum is small, the bacterial contaminants are not overwhelmingly virulent, the wound microenvironment is healthy, and the host defenses are intact. The risk of surgical site infection is related proportionally with the above factors.

Staphylococcus aureus



- *Staphylococcus aureus nasal carriage, noted in 30% of most healthy* populations, and especially methicillin-resistant *staph aureus (MRSA),* predisposes patients to have higher risk of SSI.10 Having an endogenous source for the bacterium that may be responsible for as many as one out of three wounds can increase the likelihood of infection ten-fold.27,38 However, most surgical settings have not yet instituted routine active surveillance for this common carrier state, so decolonization strategies are infrequently implemented. No matter what the intervention, the patient's skin will never be sterile, but a number of strategies can be employed to reduce the bioburden. Patients should bathe or shower with an antiseptic such as chlorhexidine at least once before the operation.8 If there is any indication that physical debris has not been adequately removed, another supervised shower and shampoo should be performed on the day of surgery. Hair in the surgical incision area should be left unless removal is necessary for the procedure. If removed, caregivers should do so with clippers immediately prior to surgery. Intraoperative skin preparation is of critical importance, not only that the antibacterial solution used has broad spectrum properties, but also that the product be properly applied. Additional strategies used to reduce bacterial migration into the surgical incision include the use of antiseptic-impregnated adhesive drapes and/or novel cyanoacrylate-based skin sealants that are applied over the skin prep to immobilize residual skin flora, including those imbedded in hair follicles.

The risk of surgical site infection

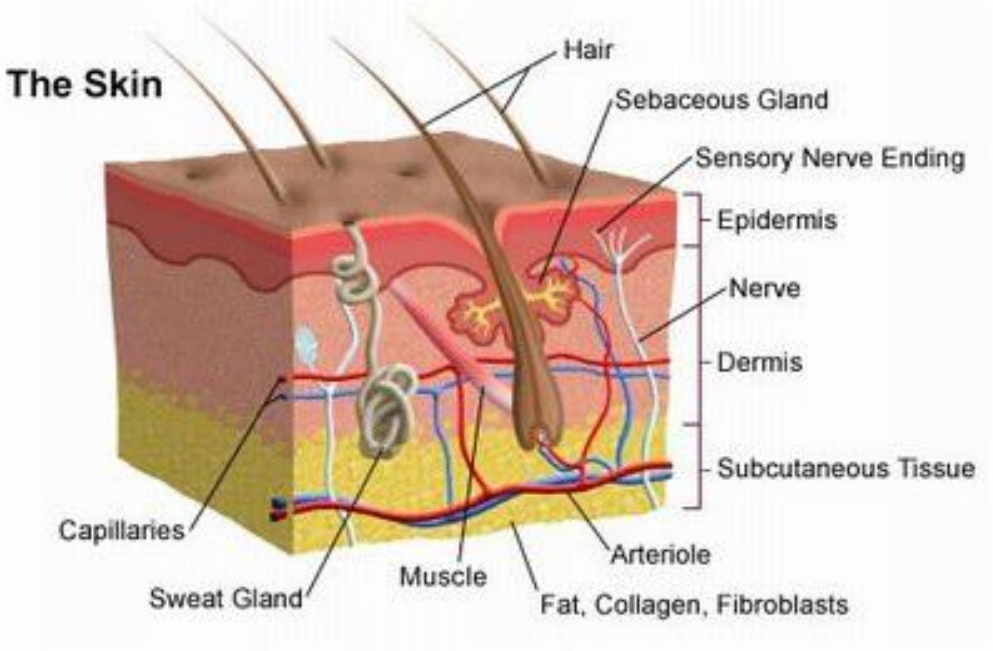
Conclusion

- Surgical site infection risk depends upon a number of patient factors, including pre-existing medical conditions, amount and type of resident skin bacteria, perioperative glucose levels, core body temperature fluctuations, and preoperative, intraoperative and postoperative care. Therefore, it is difficult to predict which wounds will become infected. For that reason, caregivers should strive for early identification of patients with risk factors amenable to intervention to minimize the risk of wound contamination in all surgical cases and to support host defenses throughout the continuum of care. These and other well-researched interventions should be bundled together and considered integral components of the best practices care we must provide our patients every day.

Anatomy of Human Skin

Normal flora of the skin: There are approximately up to 3 million germs per square centimeter of skin. Organisms may present as: normal or resident flora (stable population) or as transient flora (transit but may multiply for a short period and are eliminated because of competition from the normal flora). The main resident flora are: Most are located superficially in the stratum corneum but some are found in the hair follicles.• S.aureus in specific sites such as the anterior nares and axillae, and hospital personnel.S.epidermidis,propionibacteria, micrococci.

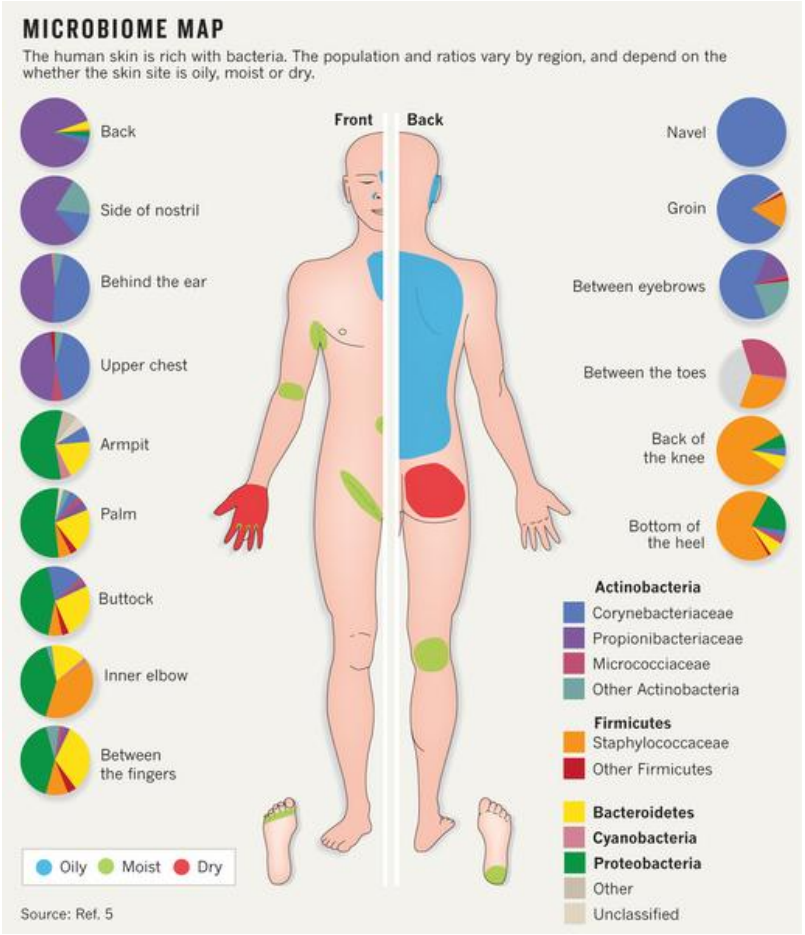
The composition of the normal flora in areas of the body differs because of ecological differences pH, temperature and nutrients (e.g. sebum, fatty acids, urea). The major barriers of the skin: Continuous desquamation of the stratum corneum. Epithelium as mechanical barrier. Lysozyme (in sweat, sebum and tears). Bacteriocins produced by commensals.



Skin flora

Skin variety provides a rich and diverse habitat for bacteria that number roughly 1000 species.

The human skin is a rich environment for microbes. Around 1000 species of bacteria from 19 bacterial phyla have been found. Most come from only four phyla: Actinobacteria (51.8%), Firmicutes (2 4.4%), Proteobacteria (16.5%), and Bacteroidetes (6.3%).
Propionibacteria and Staphylococci species were the main species in sebaceous areas. There are three main ecological areas: moist, dry and sebaceous. In moist places on the body Corynebacteria together with Staphylococci dominate. In dry areas, there is a mixture of species but dominated by
b-Proteobacteria and Flavobacteriales.



The human skin is the outer covering of the body. In humans, it is the largest organ of the integumentary system.

Skin Functions

Skin performs the following functions:

Protection: an anatomical barrier from pathogens and damage between the internal and external environment in bodily defense; Langerhans cells in the skin are part of the adaptive immune system.

Sensation: contains a variety of nerve endings that react to heat and cold, touch, pressure, vibration, and tissue injury; see somatosensory system and hap tics.

Heat regulation: the skin contains a blood supply far greater than its requirements which allows precise control of energy loss by radiation, convection and conduction. Dilated blood vessels increase perfusion and heat loss, while constricted vessels greatly reduce cutaneous blood flow and conserve heat.

Control of evaporation: the skin provides a relatively dry and semi-impermeable barrier to fluid loss. Loss of this function contributes to the massive fluid loss in burns.

Aesthetics and communication: others see our skin and can assess our mood, physical state and attractiveness.

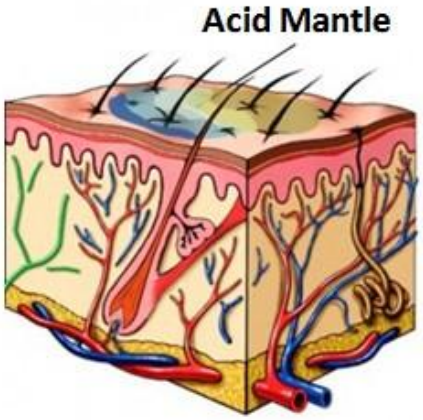
Storage and synthesis: acts as a storage center for lipids and water, as well as a means of synthesis of vitamin D by action of UV on certain parts of the skin.

Excretion: sweat contains urea, however its concentration is 1/130th that of urine, hence excretion by sweating is at most a secondary function to temperature regulation.

Absorption: the cells comprising the outermost 0.25–0.40 mm of the skin are "almost exclusively supplied by external oxygen", although the "contribution to total respiration is negligible". In addition, medicine can be administered through the skin, by ointments or by means of adhesive patch, such as the nicotine patch or iontophoresis. The skin is an important site of transport in many other organisms.

Water resistance: The skin acts as a water resistant barrier so essential nutrients aren't washed out of the body.

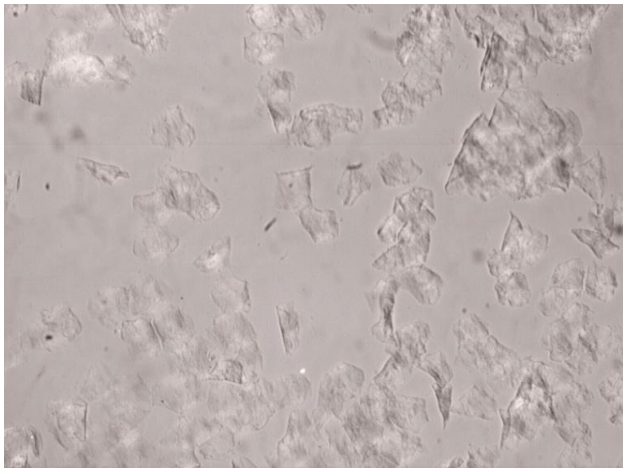
Skin pH



In the last decade, the role of skin pH as a factor in vital SC function has been investigated. Likely, much remains to be learned about the complex relation of skin pH and downstream pH dependant events. We do know that many skin diseases characterized by faulty barrier function have aberrant pH values. This should prompt the clinician to focus on preserving or restoring an acidic milieu by selecting topical agents compatible with the acid mantle.

- Nearly a century ago, Schade and Marchionini first coined the term *Säuremantel* or “acid mantle” to describe the inherent acidic nature of the stratum corneum (SC). In the last decade it has been demonstrated that skin pH largely influences barrier homeostasis, SC integrity and cohesion, and antimicrobial defense mechanisms.
- In spite of mounting evidence that skin pH plays a vital role in SC function, application of the “acid mantle” concept in clinical care has lagged behind. The importance of preserving an acidic skin pH, especially in those affected by certain skin diseases, remains an under-recognized topic by practicing U.S dermatologists. This is evident by the scarcity of low pH soaps, cleansers, and moisturizers available in the US market.
- The purpose of this article is to reintroduce the subject of the “acid mantle” and provide the reader with objective evidence that skin pH is intimately linked to vital SC function. It is impossible to ignore recent compelling basic science investigations placing the role of pH in the forefront of SC function. Aberrant pH has been noted in several skin diseases and these will be reviewed. Finally, practical recommendations will be discussed with respect to use of soaps, cleansers, and moisturizers that preserve the “acid mantle”. At the very least, we hope to provide some “pH” good for thought.

Skin pH
Human Skin Flakes

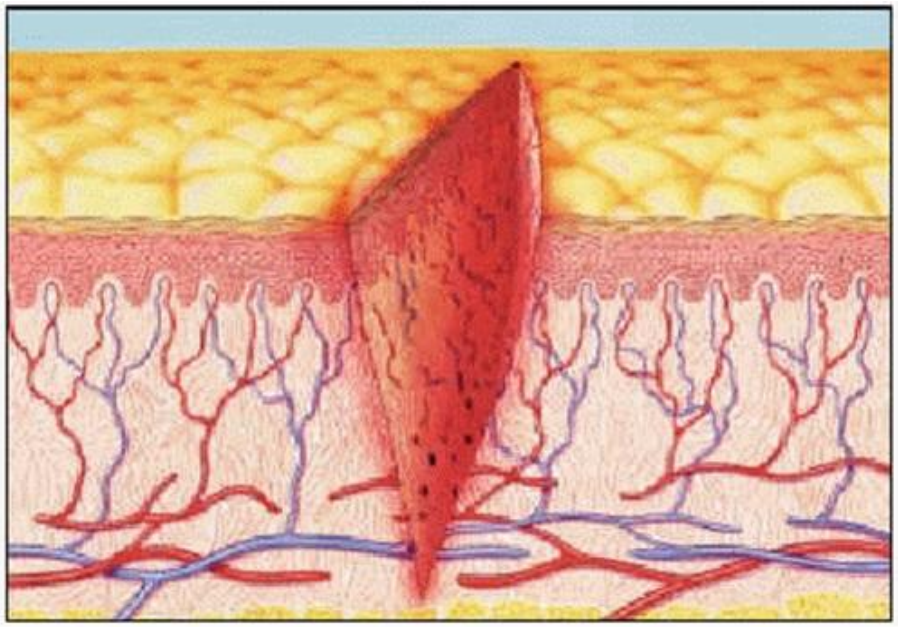


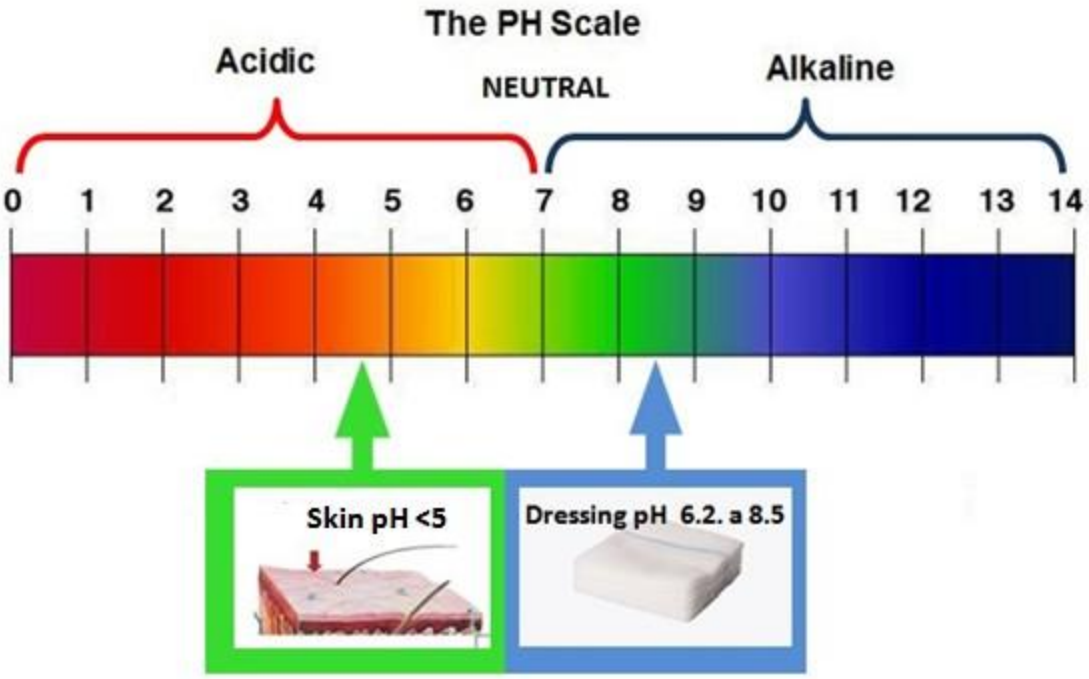
- While it was known for many decades that we have an acidic pH on our skin surface, the physiological role was discovered much later. The normal skin microbiological flora which protects against an overgrowth of pathogenic bacteria was discovered later. And the important role of the acidic pH for the epidermal barrier was only discovered in the last couple of years. It turned out that the acid pH is required for the normal desquamation. Desquamation and the production of scales was neglected in dermatology for a long time. Yet, it is an important part of skin biology. The skin renews itself continuously, in fact once in 28 days. New cells are produced which mature, form the epidermal barrier – and which need to be removed otherwise we will be trapped in a thick layer of skin over time. The desquamation process requires a set of enzymes in the most superficial parts of the skin which are only active when the pH is acidic. This is an extremely elegant system. If the pH is around 7.4 (such as in our body as well as in the skin except the most superficial layers) the formation of a strong barrier is not perturbed. Everything progresses smoothly. When the cells reach the outermost layers however, they get the acidic pH “signal” and this activates the “desquamation enzymes”. These break down the connecting structures, the cells become loose and are shed. At the right time, at the right place. In fact, if this system does not function properly such as in some patients with genetic disorders, severe skin diseases occur.

Wound healing

Abstract

The process of cutaneous wound healing comprises three overlapping major phases: inflammation, proliferation and tissue remodeling. However, while mechanisms are studied scientifically on the cellular and sub cellular level, there is still a lack of knowledge concerning basic clinical parameters like wound pH or pO_2. It could be proven that wound healing is affected by wound pH changes as they can lead to an inhibition of endogenous and therapeutically applied enzymes. Besides, the conformational structure of proteins and their functionality in wound healing is altered. Furthermore, the likelihood of bacterial colonization, which is a common problem in chronic wound pathogenesis, is affected by wound pH alterations. However, wound pH is rarely taken into account in current wound therapy strategies. A routinely performed monitoring of the wound pH and a subsequently adapted wound therapy would most possibly improve chronic wound therapy.





- The “acid mantle” is a topic not only of historical interest, but also of clinical significance and has recently been linked to vital stratum corneum function. Despite compelling basic science evidence placing skin pH <5 as a key factor in barrier homeostasis, stratum corneum integrity, and **antimicrobial defense**, application of the acid mantle concept in clinical care is lacking. We review recent basic science investigations into skin pH, discuss skin disorders characterized by aberrant pH, and finally discuss practical application for preservation of the acid mantle. Recognizing factors that alter skin pH and selecting products that preserve the acid mantle is of prime importance in treating Surgical Site Infections (SSI) and wounds.

NCBI Resources How To

PubMed.gov
US National Library of Medicine
National Institutes of Health

PubMed

Advanced

Abstract

Send to:

Int J Cosmet Sci. 2006 Oct;28(5):359-70. doi: 10.1111/j.1467-2494.2006.00344.x.

Natural skin surface pH is on average below 5, which is beneficial for its resident flora.

Lambers H[1], Piessens S, Bloem A, Pronk H, Finkel P.

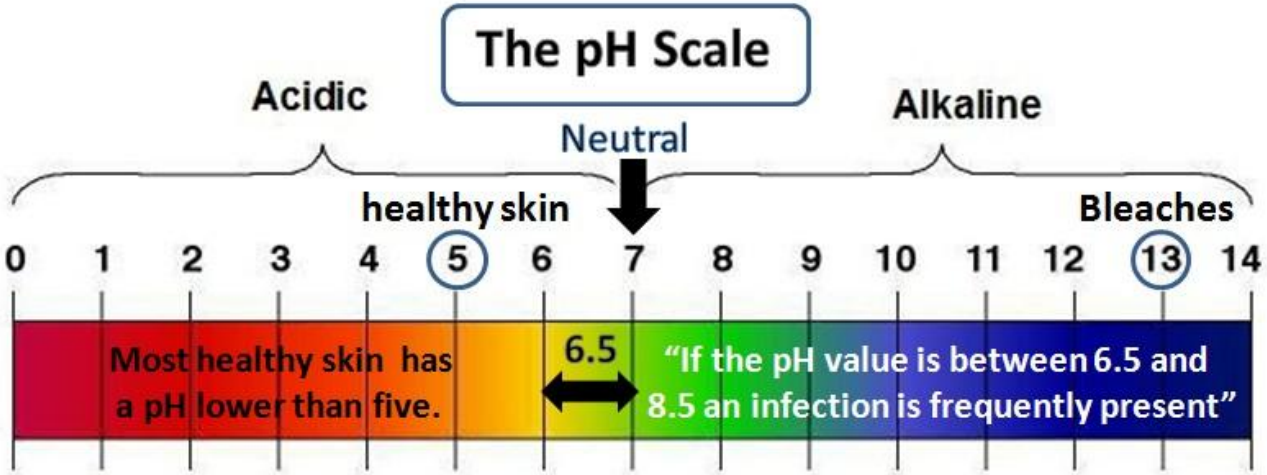
Author information

Abstract

Variable skin pH values are being reported in literature, all in the acidic range but with a broad range from pH 4.0 to 7.0. In a multicentre study (N = 330), we have assessed the skin surface pH of the volar forearm before and after refraining from showering and cosmetic product application for 24 h. The average pH dropped from 5.12 +/- 0.56 to 4.93 +/- 0.45. On the basis of this pH drop, it is estimated that the 'natural' skin surface pH is on average 4.7, i.e. below 5. This is in line with existing literature, where a relatively large number of reports (c. 50%) actually describes pH values below 5.0; this is in contrast to the general assumption, that skin surface pH is on average between 5.0 and 6.0. Not only prior use of cosmetic products, especially soaps, have profound influence on skin surface pH, but the use of plain tap water, in Europe with a pH value generally around 8.0, will increase skin pH up to 6 h after application before returning to its 'natural' value of on average below 5.0. It is demonstrated that skin with pH values below 5.0 is in a better condition than skin with pH values above 5.0, as shown by measuring the biophysical parameters of barrier function, moisturization and scaling. The effect of pH on adhesion of resident skin microflora was also assessed; an acid skin pH (4-4.5) keeps the resident bacterial flora attached to the skin, whereas an alkaline pH (8-9) promotes the dispersal from the skin.

PMID: 18489300 [PubMed]

LinkOut - more resources



(Fig.1)

(Fig.2)

Wound monitoring

"Sensor Materials"

Intelligent sticking plaster

1) on intact skin

2) on an infected wound

Normally a wound heals at a slightly acid pH level (pH <6.5).

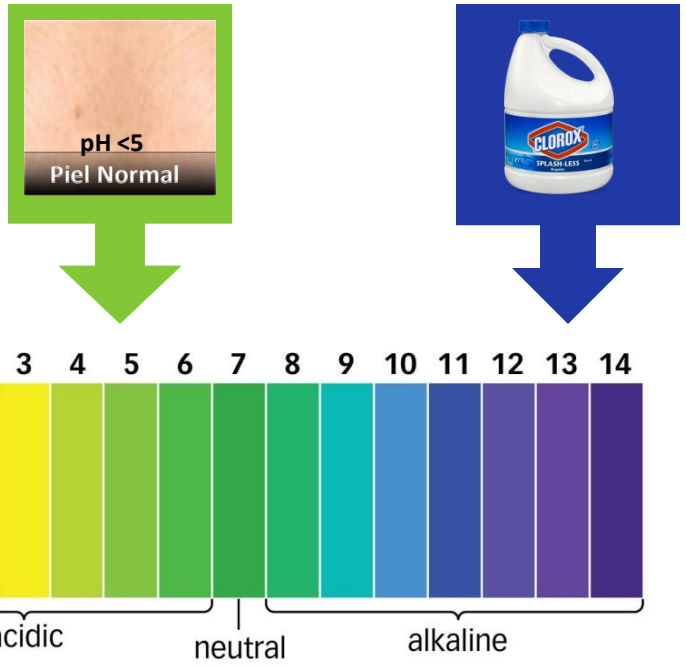
If contamination occurs which leads to a complication in the healing process the pH level can rise, thereby causing the intelligent plaster to change color (Fig.2). The necessary germ-killing therapy can be initiated immediately.

Prevention of Surgical Site Infection (Wound dressings)

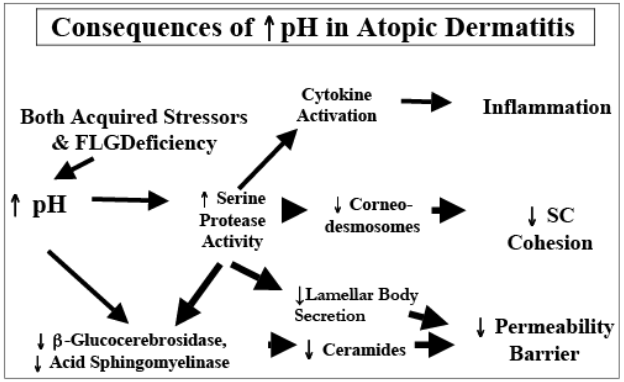
What is the benefit and *cost-effectiveness* of different types of post-surgical *interactive dressing* for reducing the risk of surgical site infection?

Surgical Site Infection (SSI) can double the length of time a patient stays in hospital and thereby increase the costs of health care. Additional costs attributable to SSI of between £814 and £6626 have been reported depending on the type of surgery and the severity of the infection. The main additional costs are related to re-operation, extra nursing care and interventions, and drug treatment costs. The indirect costs, due to loss of productivity, patient dissatisfaction and litigation, and reduced quality of life, have been studied less extensively.

Chemical formula: NaClO
Chemical Name: Sodium hypochlorite
Trade name: Clorox



It is the component such as CLOROX, famous for bleaching textile fibers. As a bleaching agent for domestic use typically contains 5-6.5% sodium hypochlorite (with a pH of about 13, it is irritating and corrosive to metals



- **Skin pH and antimicrobial properties**

- The micro flora of the skin consists of transient, temporary-resident, and permanent-resident species, including coagulase-negative staphylococci. **Normal flora growth is optimal at acidic pH levels, whereas pathogenic bacteria, such as *S. aureus*, thrive at a neutral pH levels**. Dermicidin, an antimicrobial peptide found in sweat, demonstrates antimicrobial activity against a variety of pathogenic microorganisms. Incubation of *S. aureus* with a sweat fraction containing dermicidin induced > 90% bacteriocidal effect when buffered at pH 5.5, and only 60% when buffered at pH 6.5. Chikakane & Takashashi have also postulated reduced antibacterial activities of cationic substances, such as certain basic proteins, due to reduced acidity. Nitrate secreted in sweat is converted to nitrite by bacteria. Nitrite then forms reactive nitrogen species which serve as a non-specific antibacterial defense mechanism. This occurs in an acidic skin.

Medical textiles

INTRODUCTION

- Combination of textile technology and medical sciences has resulted into a new field called medical textiles. Medical textiles are one of the most rapidly expanding sectors in the technical textile market. Textile materials in the medical textile field gradually have taken on more important roles. The wide range of textile products used in the medical industry are classified in to four major segments namely non-implantable materials, implantable materials, extracorporeal devices and healthcare & hygiene products. This paper deals with the specifications/properties required and different types of test methods involved for evaluating the characteristics of the medical textile products.

One of the aspects of greater impact to consider medical level, the textile industry uses the oxidative bleaching. The cellulose fibers are bleached almost exclusively by oxidative methods. The most common chlorine.

Bleaching with sodium hypochlorite (NaOCl) is performed with an alkaline pH,11 thereby altering the acid pH <5 physiologically normal skin. The nonwoven or top layer of gauze / sponge or "contact layer wound" fabric is a determining factor in operative infection or surgical site by Staphylococcus aureus (50.1%) and other pathogens (49.9%) in the polymicrobial surgical wounds and according to their pathogenesis and epidemiology if appropriate prophylaxis is given, the bacteria can colonize wounds.

Bleaching with sodium hypochlorite (NaOCl) is performed with an alkaline Ph 11

Bleaching with sodium hypochlorite causes a series of subsidiary reactions leading to production of a range of AOX (absorbable organic halogens) including trichloromethane (Lacasse and Baumann, 2004) and dioxin precursors (Stringer and Johnston 2001 is). In Germany hypochlorite bleaching (UBA 2003) has been replaced, largely, in the rest of Europe are not allowed. However, its use worldwide remains widespread, not only for bleaching, but also for cleaning machines applying dyes and whitening defectively dyed garments (Lacasse and Baumann 2004). Another alternative agent is highly effective chlorine and sodium chlorite ($NaClO_2$), which produces much lower levels of AOX than hypochlorite. The active bleaching agent, the ClO_2 gas, is hydrophobic, which prevents the cellulose fibers are damaged. However, the substance is difficult to handle. Chlorine dioxide is highly toxic, fiber and attacks is unstable. Although the levels of AOX are lower, the total replacement of chlorine bleach is the only way to prevent the release of hazardous substances (Stringer and Johnston 2001).

IMSS

GAUZE SPONGES

GASA ESPONJA

INTERNATIONAL STANDARDS

S.No	International standard	Scope/Test parameter
1	EN14683	This standard is intended to help facilitate the choice of surgical face masks in the European Market by standardizing the information and performance data required for the masks.
2	EN 13795	Establish requirements for surgical drapes, gowns and clean air suits used as medical devices for patients, clinical staff and equipment.
3	EN 14079	Surgical gauze specification
4	EN 1372-1	Surgical dressings
5	EN 862-2	Alcohol repellency
6	EN 1734	Water resistance
7	EN 20811	Liquid repellency
8	EN 556	Sterilization of healthcare products
9	ASTM F 2100	This specification covers testing and requirements for materials used in the construction of medical face masks that are used in providing health care services such as surgery and patient care. This specification provides for the classification of medical face mask material performance.
10	ASTM F 2407	This specification establishes requirements for the performance, documentation, and labeling of surgical gowns.
11	ASTM F1983	Standard practice for assessment of compatibility of absorbable/resorbable biomaterial for implant applications
12	ASTM F2026	Standard specification for Polyetheretherketone (PEEK) Polymers for Surgical Implant Applications
13	ASTM E 96	Water vapor permeability
14	ASTM ES-21	Blood Repellency
15	ASTM D 734	Porosity
16	ASTM D 894	Peel strength
17	ASTM D 671	Water vapour permeability
18	ASTM D 357	Air permeability of hospital linen & bandages
19	ASTMD 4751	Pore size
20	AS 3789.8	Textiles for health care facilities and institutions – Recyclable barrier fabrics
21	AS 3789.6	Textiles for healthcare facilities and institutions- Fabric specifications
22	AS 4369.4	Specifies requirements for manufacturing absorbent wadding, including cotton wool balls and cotton wool rolls for use in surgical procedures
23	NBR13904	Brazilian standard giving specifications of sutures
24	IST 10.1	Wicking rate
25	IST 80.0	Absorbency
26	IST 80.9	Water Repellency
27	IST 90.0	Softness
28	IST 50.0	Flame retardance
29	IST 80.6	Alcohol repellency
30	BS 2823	Water resistance
31	BS 4745	Thermal resistance
32	BS 1425	Microbial resistance
33	ISO 811	Water resistance
34	ISO 16603	Synthetic blood penetration
35	ISO 16604	Viral penetration
36	ISO 1420 A	Water resistance
37	ISO 3781	Wet tensile strength
38	IS0 11193-1	Knot strength
39	ISO 10993-5	Bio compatibility
40	ISO 17190-1	PH of polyacrylate
41	ISO 17190-2	Residual monomers
42	ISO 17190-3	Residual size distribution
43	ISO 25539-1	Graft testing
44	ISO 11137	Sterilization of healthcare products
45	ISO 9949-2	Defines 9 terms used in the field of urine absorbing aids and

		comprises the vocabulary for products. The terms used for products do not, individually or collectively, define or recommend specific designs, styles or constructions.
46	ISO 22610	Surgical drapes, gowns and clean air suits, used as medical devices, foe patients, clinical staff and equipment – Test method to determine the resistance to wet bacterial penetration
47	ISO 22612	Clothing for protection against infectious agents – Test methods for resistance to dry microbial penetration

6. IMPORTANT TEST METHODS FOR NONWOVEN

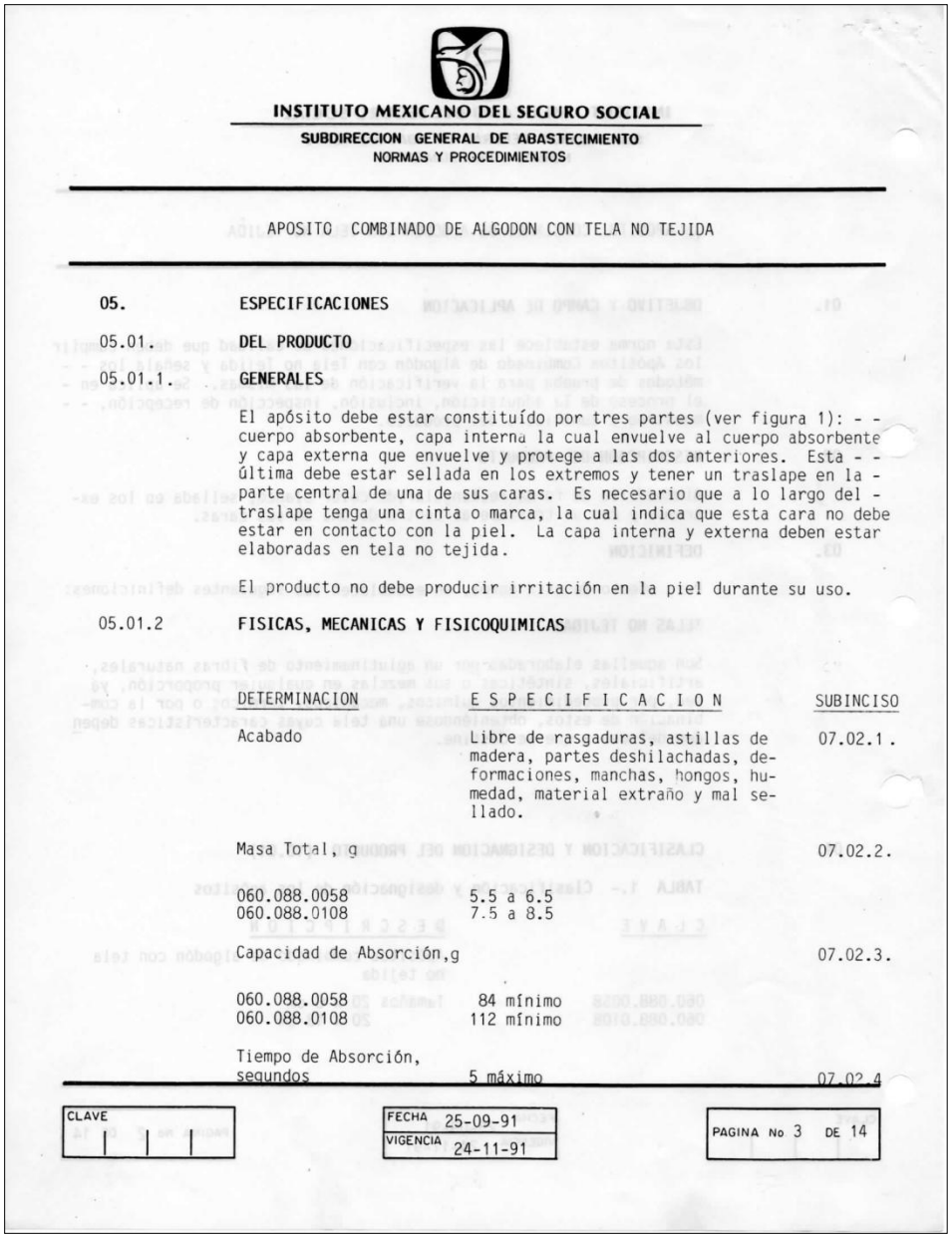
S.No	International standard	Scope/Test parameter
1	EN 1644-1 & E N 1644-2	Specification of Nonwoven gauze
2	ASTM D 1295	Crease recovery (Nonwoven)
3	ISO 9073-1	Determination of mass/unit area
4	ISO 9073-2	Determination of thickness
5	ISO 9073-3	Determination of tensile strength and elongation
6	ISO 9073-4	Determination of tear resistance
7	ISO 9073-5	Determination of resistance to mechanical penetration
8	ISO 9073-6	Absorption
9	ISO 9073-7	Determination of bending length
10	ISO 9073-8	Determination of liquid strike-through time (simulated urine)
11	ISO 9073-9	Determination of drapability including drape coefficient
12	ISO 9073-10	Lint and other particles generation in the dry state
13	ISO 9073-11	Run-off
14	ISO 9073-12	Demand absorbency
15	ISO 9073-13	Repeated liquid strike-through time
16	ISO 9073-14	Coverstock-wetback

17	ISO 9073-15	Determination of air permeability
18	ISO 9073-16	Determination of resistance to penetration by water (hydrostatic pressure)
19	ISO 9073-17	Determination of resistance to penetration by water (spray impact)
20	ISO 9073-18	Determination of breaking strength and elongation using grab tensile test

Product specifications.

The dressing should be made up of three parts (see Figure 1): - - absorbent, inner layer which surrounds the outer layer absobente body that surrounds and protects the two. The latter must be sealed at the ends and have an overlap in the central part of one side. It is necessary that during the overlap has a stripe or mark, which indicates that this face should not be in contact with the skin. The inner and outer layer should be made in nonwoven fabric.

The product should not cause skin irritation during use.



INSTITUTO MEXICANO DEL SEGURO SOCIAL

SUBDIRECCION GENERAL DE ABASTECIMIENTO
NORMAS Y PROCEDIMIENTOS

APOSITO COMBINADO DE ALGODON CON TELA NO TEJIDA

05. ESPECIFICACIONES

05.01. DEL PRODUCTO

05.01.1. GENERALES

El apósito debe estar constituído por tres partes (ver figura 1): - - cuerpo absorbente, capa interna la cual envuelve al cuerpo absorbente y capa externa que envuelve y protege a las dos anteriores. Esta - - última debe estar sellada en los extremos y tener un traslape en la - parte central de una de sus caras. Es necesario que a lo largo del - traslape tenga una cinta o marca, la cual indica que esta cara no debe estar en contacto con la piel. La capa interna y externa deben estar elaboradas en tela no tejida.

El producto no debe producir irritación en la piel durante su uso.

05.01.2 FISICAS, MECANICAS Y FISICOQUIMICAS

DETERMINACION	E S P E C I F I C A C I O N	SUBINCISO
Acabado	Libre de rasgaduras, astillas de madera, partes deshilachadas, deformaciones, manchas, hongos, humedad, material extraño y mal sellado.	07.02.1.
Masa Total, g		07.02.2.
060.088.0058	5.5 a 6.5	
060.088.0108	7.5 a 8.5	
Capacidad de Absorción,g		07.02.3.
060.088.0058	84 mínimo	
060.088.0108	112 mínimo	
Tiempo de Absorción, segundos	5 máximo	07.02.4

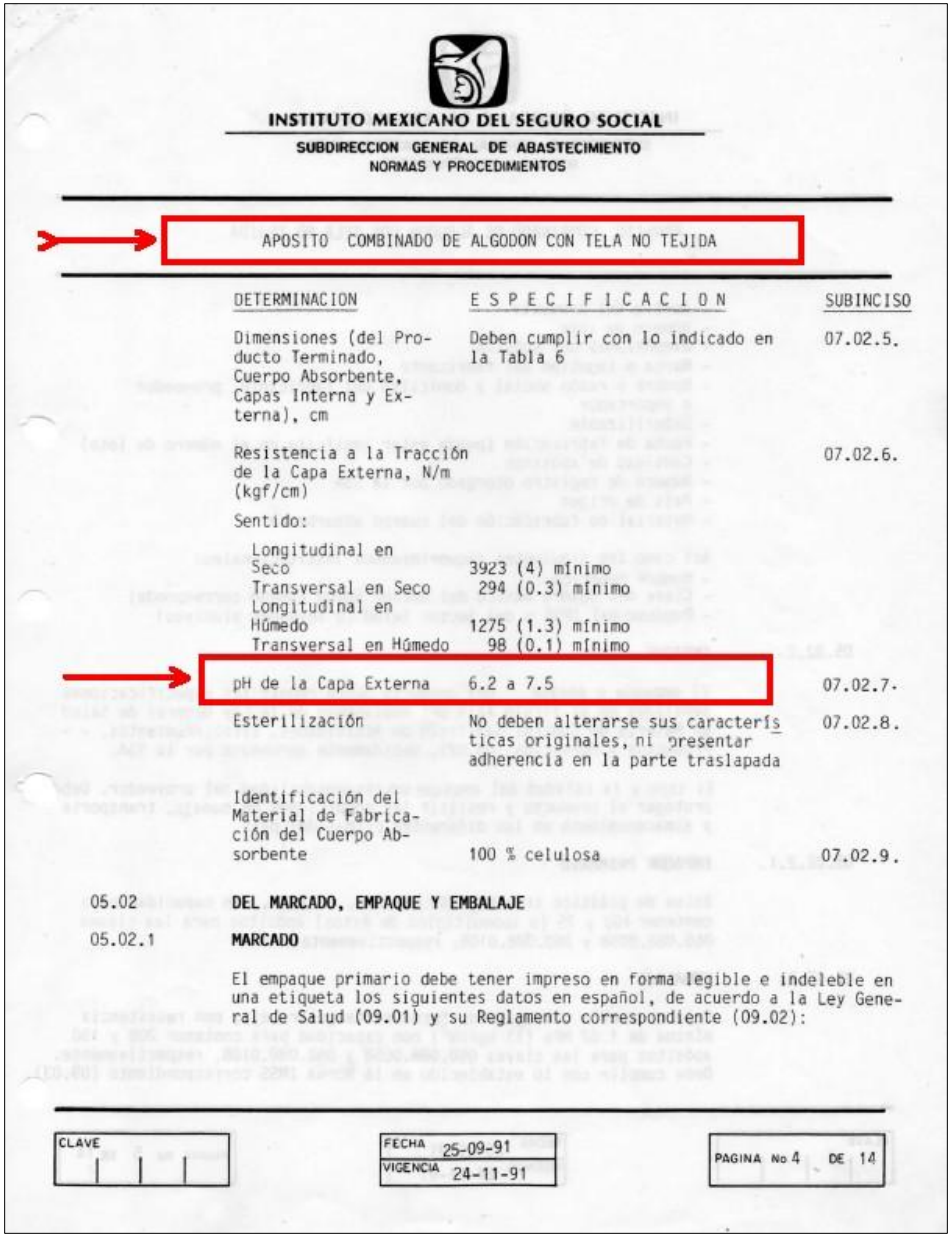
CLAVE

FECHA 25-09-91
VIGENCIA 24-11-91

PAGINA No 3 DE 14

Product specifications pH the outer layer 6.2 to 7.5

Current specifications of the dressing at the institutional level in Mexico. the outer layer pH is 6.2 to 7.5 Surgical dressing gauze or institutional factors altering skin pH recognize and select products that preserve the acid mantle is of paramount importance in the treatment of Surgical Site Infections and , healing and infections wounds.



INSTITUTO MEXICANO DEL SEGURO SOCIAL
SUBDIRECCION GENERAL DE ABASTECIMIENTO
NORMAS Y PROCEDIMIENTOS

APOSITO COMBINADO DE ALGODON CON TELA NO TEJIDA

DETERMINACION	E S P E C I F I C A C I O N	SUBINCISO
Dimensiones (del Producto Terminado, Cuerpo Absorbente, Capas Interna y Externa), cm	Deben cumplir con lo indicado en la Tabla 6	07.02.5.
Resistencia a la Tracción de la Capa Externa, N/m (kgf/cm)		07.02.6.
Sentido:		
Longitudinal en Seco	3923 (4) mínimo	
Transversal en Seco	294 (0.3) mínimo	
Longitudinal en Húmedo	1275 (1.3) mínimo	
Transversal en Húmedo	98 (0.1) mínimo	
pH de la Capa Externa	6.2 a 7.5	07.02.7.
Esterilización	No deben alterarse sus características originales, ni presentar adherencia en la parte traslapada	07.02.8.
Identificación del Material de Fabricación del Cuerpo Absorbente	100 % celulosa	07.02.9.

05.02 **DEL MARCADO, EMPAQUE Y EMBALAJE**

05.02.1 **MARCADO**

El empaque primario debe tener impreso en forma legible e indeleble en una etiqueta los siguientes datos en español, de acuerdo a la Ley General de Salud (09.01) y su Reglamento correspondiente (09.02):

CLAVE | FECHA 25-09-91 | VIGENCIA 24-11-91 | PAGINA No 4 DE 14

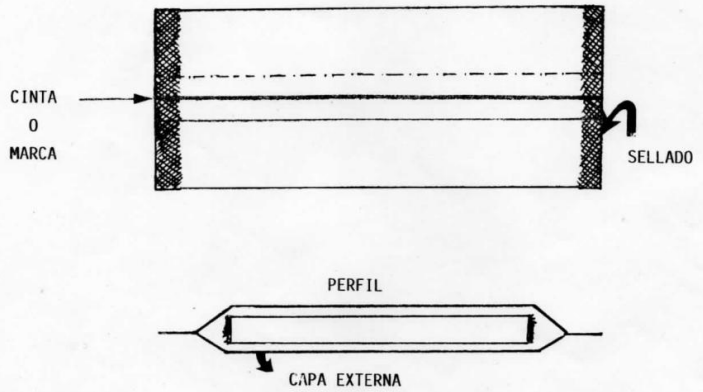
DRESSING DESIGN

INSTITUTO MEXICANO DEL SEGURO SOCIAL

SUBDIRECCION GENERAL DE ABASTECIMIENTO

NORMAS Y PROCEDIMIENTOS

APOSITO COMBINADO DE ALGODON CON TELA NO TEJIDA



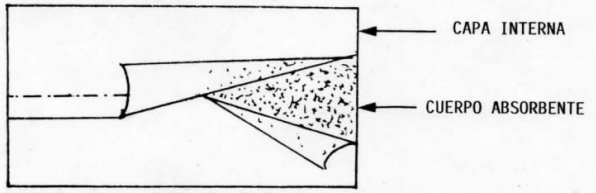


FIGURA 1.- Apósito combinado

CLAVE | | |

FECHA 25-09-91

VIGENCIA 24-11-91

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SURGERY

Gauze Sponges
Esponjas de Gasa

Front
Skin Contact

Back
Outside

Sterile Surgical Dressing with Sealed Package

- Blum's mission is to offer the highest quality products and disposable surgical dressings and help patients and medical staff to prevent surgical site infection. Blum brand is a new generation of dressings, gauze / sterile sponges, designed with a band tourmaline generates negative ions (anions) and emits far infrared rays (Far-IR). The Blüm dressings can be used not only for pre- and post-operative, are also excellent aids in the management of any type of wound.

- ✓ Blum dressings has several key features that make them different:
- ✓ We have a special line whose product is sterilized with ethylene oxide.
- ✓ This product has a polymer barium sulphate x-ray detectable in the midline (for easy detection)
- ✓ Antimicrobial dressings designed with Tourmaline band.
- ✓ Helps maintain the optimum pH level of the skin and thereby reduce the risk of surgical site infection (SSI)
- ✓ Upon skin contact, friction or pressure onto the dressing emitting negative ions and far infrared generated.
- ✓ Permeable step oxygen, a factor that allows the anaerobic bacteria are eliminated
- ✓ Polymer designed Súpeabsorbente (PSSA) for quick and abundant absorption by osmosis.
- ✓ Reduces the risk of keloid scarring
- ✓ It maintains a dry surface, preventing maceration of the wound and contact dermatitis by the presence of body fluids.
- ✓ Soft, comfortable to anatomically placed anywhere on the body, available in a variety of measures.

- In conclusion Voiles / sponges Blüm have four characteristics that make them unique: It is antimicrobial, are super absorbent and are permeable to oxygen and maintain the optimal pH of the skin.

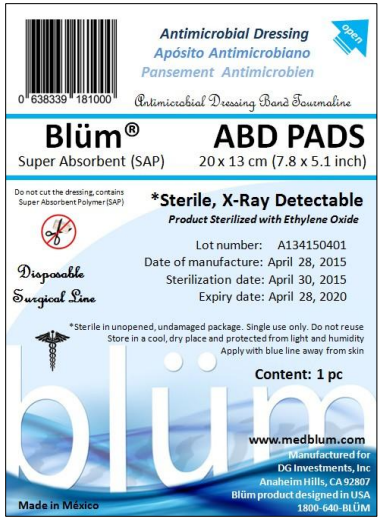
- The product is sterilized individually protecting them from moisture and exposure to contamination by microorganisms.

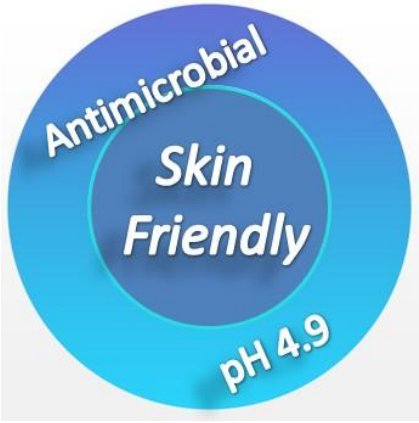
Our approach is to change the optimal environment for microbes.

- Product main function:

- Emission of Far Infrared Rays and Anion Tourmaline Band: This is a distinctive feature of technology Blum products as used dressings and being in contact with the skin, high concentrations of negative ions (6190 ↑ / cm^3) they are issued reducing the antimicrobial function, reduces bad olo and other positive effects can be obtained by changing the physical environment of microbes. The function Far Infrared Rays Far-IR improve metabolism and microcirculation of an individual, activ cells and strengthens the immune system. Blum technology has anti-inflammatory and antiseptic effects without presenting side effects. Possibly some patients may refer a minimum burning by the pH of the fiber and skin contact if it has been exposed. of bandage dressing more or less in the same proportion that occurs with highly alkaline dressings.

- Manufacturing: Blüm pads and dressings are manufactured in strict compliance with the National Health Standard GB15979-2002 in the People's Republic of China. To ensure that the production process and automated packing is free from contamination. We are currently developing the production and sterilization in Mexico in a medical environment according to international standards (ISO)





Blüm the new generation of disposable surgical products designed with the latest in innovation and nanotechnology.

- The top layer of gauze / sponge or "contact layer wound" maintains proper skin pH 4.9 stabilizing the acid mantle of the stratum corneum stopping the spread of microbial infection, and promoting conditions more synergizing healthy skin.

SOUTH-CHINA TESTING CENTER (Shanghai)

Tel:+86-21-55213553, 55211172 . Fax:+86-21-65891647

Service contains: Auto parts reliability tests, Environmental tests, Auto materials tests

Test

Test Item	Concentratio
Report No	55643-1
Sample Name	Multi functio
Sample Receive Date	May . 7, 201
Test Performing Date	May. 17, 201
Applicant	DG Investme

TEST METHOD
SFJJ-QWX25-2006

RESULTS:

Concentration of anion

*** End

Reported by:.....

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approval, The letters and reports apply only to those samples tested. Sam
or its insignia or reports are not to be used by the customer in any forms of media advertising.

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DIRECCIÓN GENERAL DE ENSEÑANZA Y CALIDAD
DEPARTAMENTO DE INVESTIGACIÓN
Formato de Registro

NC

rísticas de uso de la Toalla Femenina BLUM en las

a López Morales

na Romero Arredondo

23 del Reglamento de la Ley de Salud General en
sa al investigador la obtención del consentimiento

Año 2013 Mes 09

Director de Enseñanza Capacitación e Investigación

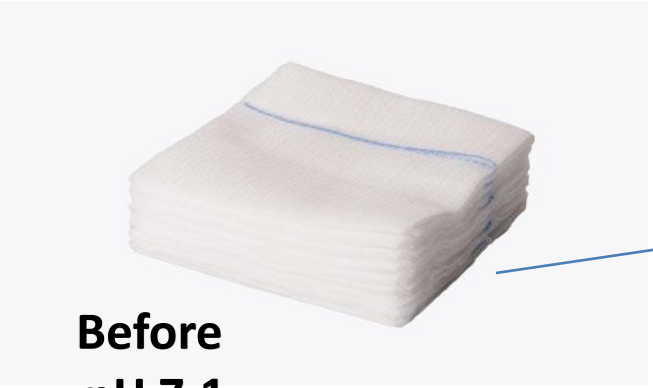
Dr. Ricardo Franco Hernández

WECK LABORATORIES, INC.

Federal Certification

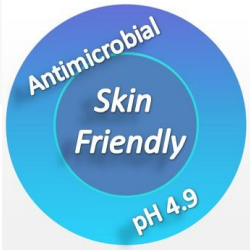
- Perry Johnson Laboratory Accreditation DOD-ELAP
- Perry Johnson Laboratory Accreditation ISO 17025:2005
- EPA Region IX ATP Approval for ICPMS 200.8 method
- EPA Region IX ATP Approval for IC 300.0 method
- EPA UCMR2 approval
- EPA UCMR3 approval
- US Department of Agriculture - Soil Import Permit

Certificate of Analysis, after subjecting the fabric to impregnation our formula, to maintain the proper pH of the skin.



Before
pH 7.1

After
pH 4.9



WECK LABORATORIES, INC.
Analytical Laboratory Service - Since 1964

Certificate of Analysis

Report Date: 04/30/15 09:34
Received Date: 04/21/15 14:50
Turnaround Time: 7 workdays

Project: Blüm-DG Invesment inc

Phones: (714) 240-5121
Fax:
P.O. #:

Attn: Dr. Jose Zavala

Client: Dr. Jose Zavala
6510 El Paseo Caballo
Anaheim, CA 92807

Dear Dr. Jose Zavala :

Enclosed are the results of analyses for samples received 4/21/2015 with the Chain of Custody document. The samples were received in good condition, at 22.6 °C. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Lab ID: 5D21084-01 Sample ID: Sample + DI IMSS Gauze Matrix: Solid
Sampled by: Client Sampled: 04/21/15 00:00

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
pH	7.1			Units	1	EPA 9045C	4/28/15	4/29/15 12:11	WSD1471	A-01

Lab ID: 5D21084-02 Sample ID: Sample + Chloric Acid Gauze (IMSS) Matrix: Solid
Sampled by: Client Sampled: 04/21/15 00:00

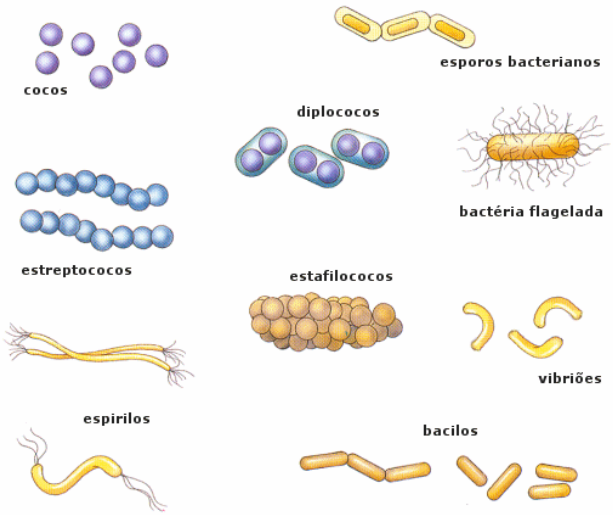
Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
pH	4.9			Units	1	EPA 9045C	4/28/15	4/29/15 12:11	WSD1471	A-01a

Lab ID: 5D21084-03 Sample ID: Blüm Band Matrix: Solid
Sampled by: Client Sampled: 04/21/15 00:00

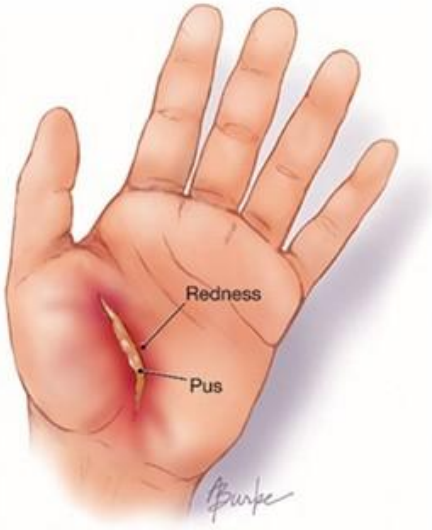
Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Aluminum, Total	8.9		6.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Antimony, Total	40		2.5	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Arsenic, Total	ND		1.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Barium, Total	ND		2.5	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Beryllium, Total	ND		0.62	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Boron, Total	ND		1.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Cadmium, Total	ND		0.62	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Calcium, Total	310		62	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Chromium, Total	ND		1.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Cobalt, Total	ND		1.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Copper, Total	ND		6.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Iron, Total	26		6.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Lead, Total	ND		1.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Lithium, Total	ND		6.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Magnesium, Total	ND		62	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	
Manganese, Total	ND		1.2	mg/kg	1	EPA 6010B	4/22/15	4/28/15 14:38	WSD1209	

5D21084 Page 1 of 4

Weck Laboratories, Inc 14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

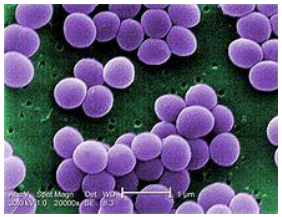


“Blum” Gauze Sponges **normalize skin pH** and stop the spread of microbial infections and surgical site infections with no side effects. To control bacterial growth, the skin is normally slightly acidic with a pH of 5.0 **The skin with a pH 6.5 > is considered in imbalance and conducive to developing infections.**



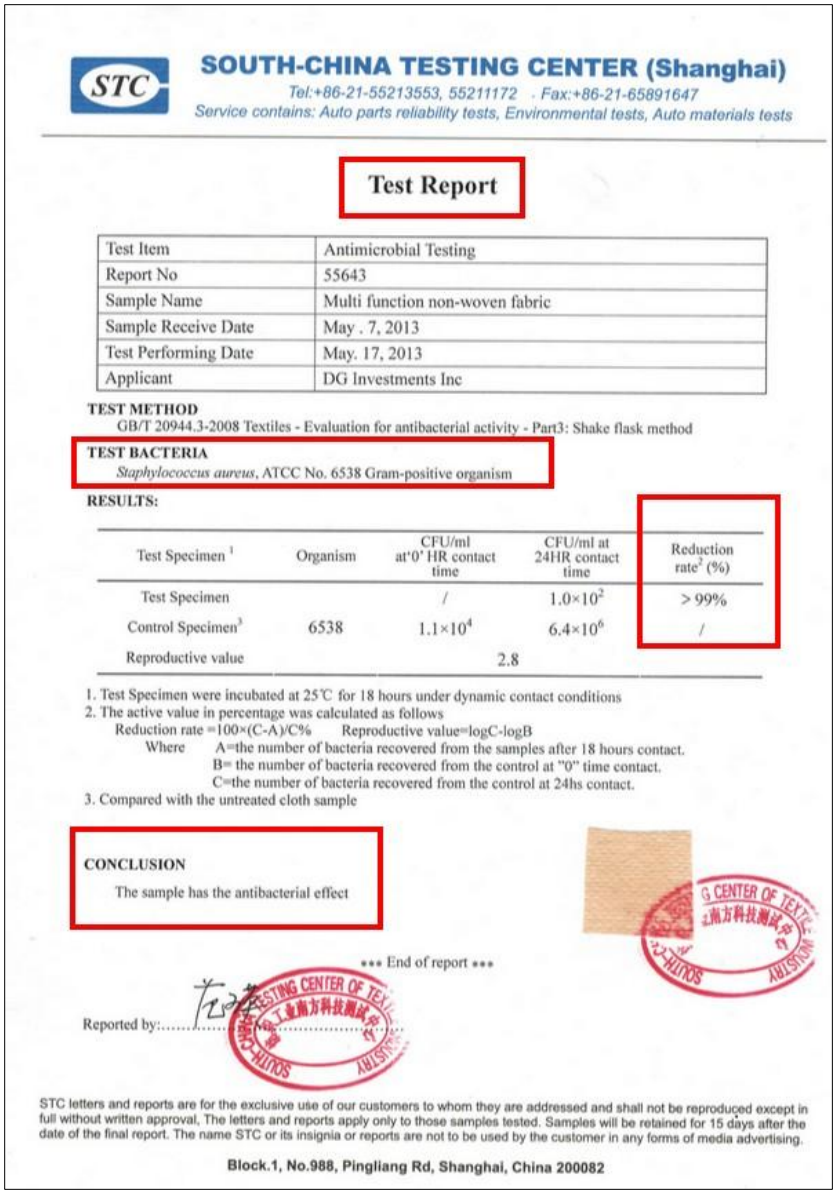
Skin with a pH of <6.5 is considered unbalanced

Test report.
The sample has the antibacterial effect



Staphylococcus aureus

S. aureus and infection usually polymicrobial. Pathogenesis and epidemiology if prophylaxis is not given, bacteria colonize burn wounds within 24 hours and cause cellulites of adjacent tissues and septicemia.



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Service contains: Auto parts reliability tests, Environmental tests, Auto materials tests

Test Report

Test Item	Antimicrobial Testing
Report No	55643
Sample Name	Multi function non-woven fabric
Sample Receive Date	May . 7, 2013
Test Performing Date	May. 17, 2013
Applicant	DG Investments Inc

TEST METHOD

GB/T 20944.3-2008 Textiles - Evaluation for antibacterial activity - Part3: Shake flask method

TEST BACTERIA

Staphylococcus aureus, ATCC No. 6538 Gram-positive organism

RESULTS:

Test Specimen [1]	Organism	CFU/ml at'0' HR contact time	CFU/ml at 24HR contact time	Reduction rate[2] (%)
Test Specimen		/	1.0×10^2	> 99%
Control Specimen[3]	6538	1.1×10^4	6.4×10^6	/
Reproductive value		2.8		

1. Test Specimen were incubated at 25℃ for 18 hours under dynamic contact conditions
2. The active value in percentage was calculated as follows
   Reduction rate =100×(C-A)/C% Reproductive value=logC-logB
   Where A=the number of bacteria recovered from the samples after 18 hours contact.
   B= the number of bacteria recovered from the control at "0" time contact.
   C=the number of bacteria recovered from the control at 24hs contact.
3. Compared with the untreated cloth sample

CONCLUSION

The sample has the antibacterial effect

*** End of report ***

Reported by:.....

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Blüm-DG Investments, Inc.
Challenge Study
May 4, 2015

I. OBJECTIVE

To evaluate the antimicrobial effectiveness of SMS Fabric with Blüm Technology inoculated with *Pseudomonas aeruginosa* and *Staphylococcus aureus*.

II. PROCEDURE

a. Inoculum Preparation

i. The fabric strips were autoclaved at 121°C for 15 minutes to ensure the sterility of the fabric prior to inoculation. The fabric strips were then aseptically separated into 2 sets with 1 strip retained as a control.
ii. Microorganisms were purchased from the American Type Culture Collection (ATCC) and cultured according to the manufacturer's instructions; *Pseudomonas aeruginosa* (ATCC 9027 and ATCC 10145) and *Staphylococcus aureus* (ATCC 6538, ATCC 13566, ATCC 14458 and ATCC 29213).
iii. The bacteria were streaked onto Trypticase Soy Agar (TSA; Acumedia-Neogen, Lansing,MI) and incubated at 37°C for 18 hours. Colonies were then transferred to 10mL of Tryptic Soy Broth (TSB; Acumedia-Neogen, Lansing,MI) and incubated for 18 hours at 37°C.
iv. Two inoculum cocktails were prepared by combining 10mL of TSB from each of the bacterial strains of *P. aeruginosa* (set 1) and *S. aureus* (set 2). The cocktails were determined to be between 10^5 and 10^6cfu/mL.

b. Inoculation

i. The fabric strips were directly inoculated by pipetting 1mL of the respective bacterial cocktail.
ii. The fabric strips were incubated at room temperature (20-25°C) for 0; 2; 4 or 6 hours.
iii. Phosphate buffer was added to the strips and placed in the stomacher for 2 minutes at their corresponding time of incubation.
iv. One mL of buffer from one strip was directly plated in triplicate on Cetrimide agar plates for (*P. aeruginosa* inoculated strips) and Baird Parker agar plates (for *S. aureus* inoculated strips).
v. One uninoculated strip was plated at time 0 as a negative control.

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III. RESULTS

a. Table 1: Enumeration of *P. aeruginosa* and *S. aureus* in cfu/mL and Log cfu/mL before inoculation.

Inoculum	Concentration (cfu/mL)	Concentration (log10 cfu/mL)
P. aeruginosa	4.6×10^5	4.67
S. aureus	5.9×10^5	4.77

b. Table 2: Enumeration of *P. aeruginosa* and *S. aureus* in Log cfu/mL after inoculation.

	P. aeruginosa	*S. aureus*
Negative control	< 1	< 1
Time 0 (0 hours)	< 1	< 1
Time 1 (2 hours)	< 1	< 1
Time 2 (4 hours)	< 1	< 1
Time 3 (6 hours)	< 1	< 1

IV. CONCLUSIONS

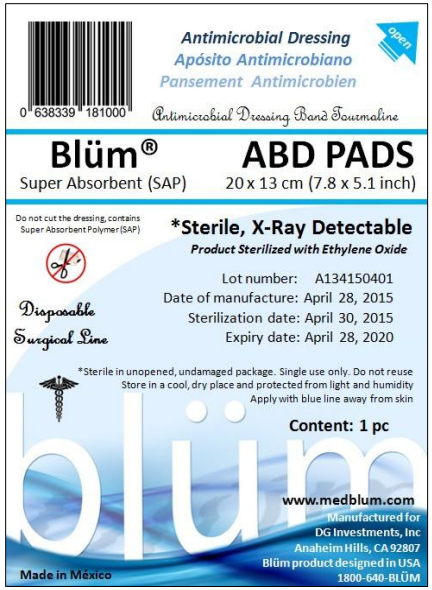
SMS Fabric with Blüm Technology has an antimicrobial effectiveness against *P. aeruginosa* and *S. aureus* for 6 hours

Analysis performed by: Senior Microbiologist, Halee Nguyen, B.S.

Reviewed by: Microbiology Manager, Anne Vitoreli, M.S.; Ph.D. Candidate

Small Solutions
Big Impact

The band Tourmaline emission of anions and far infrared radiation (in the frequency range of the electromagnetic field of the human body) has the ability to generate a flow of anions with concentration 6190 ↑ / cm³ negative ions, due to friction and the heat emitted from the body. Synergizing the immune system and promoting the elimination of pathogens, while eliminating odors. Far infrared rays strengthen and heal the skin and stimulates blood circulation.



Test report generate a flow of anions with concentration of 6190↑/cm³ negative ions in a cubic centimeter

The effects of far-infrared and anion technologies are amazing. The effectiveness of far-infrared and its therapeutic properties have been studied in worldwide for an extended period of time and is now beginning to become very popular many countries. Far-infrared is very helpful for healing the skin, blood circulation, and skin cell revitalizing. While anion is proven to be effective in inactivating mold, viruses, allergens, and other harmful airborne substances in the air.

SOUTH-CHINA TESTING CENTER (Shanghai)

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Service contains: Auto parts reliability tests, Environmental tests, Auto materials tests

Test Report

Test Item	Concentration of anion Testing
Report No	55643-1
Sample Name	Multi function non-woven fabric
Sample Receive Date	May . 7, 2013
Test Performing Date	May. 17, 2013
Applicant	DG Investments Inc

TEST METHOD
SFJJ-QWX25-2006

RESULTS:

Concentration of anion	6190 ↑/cm³

*** End of report ***

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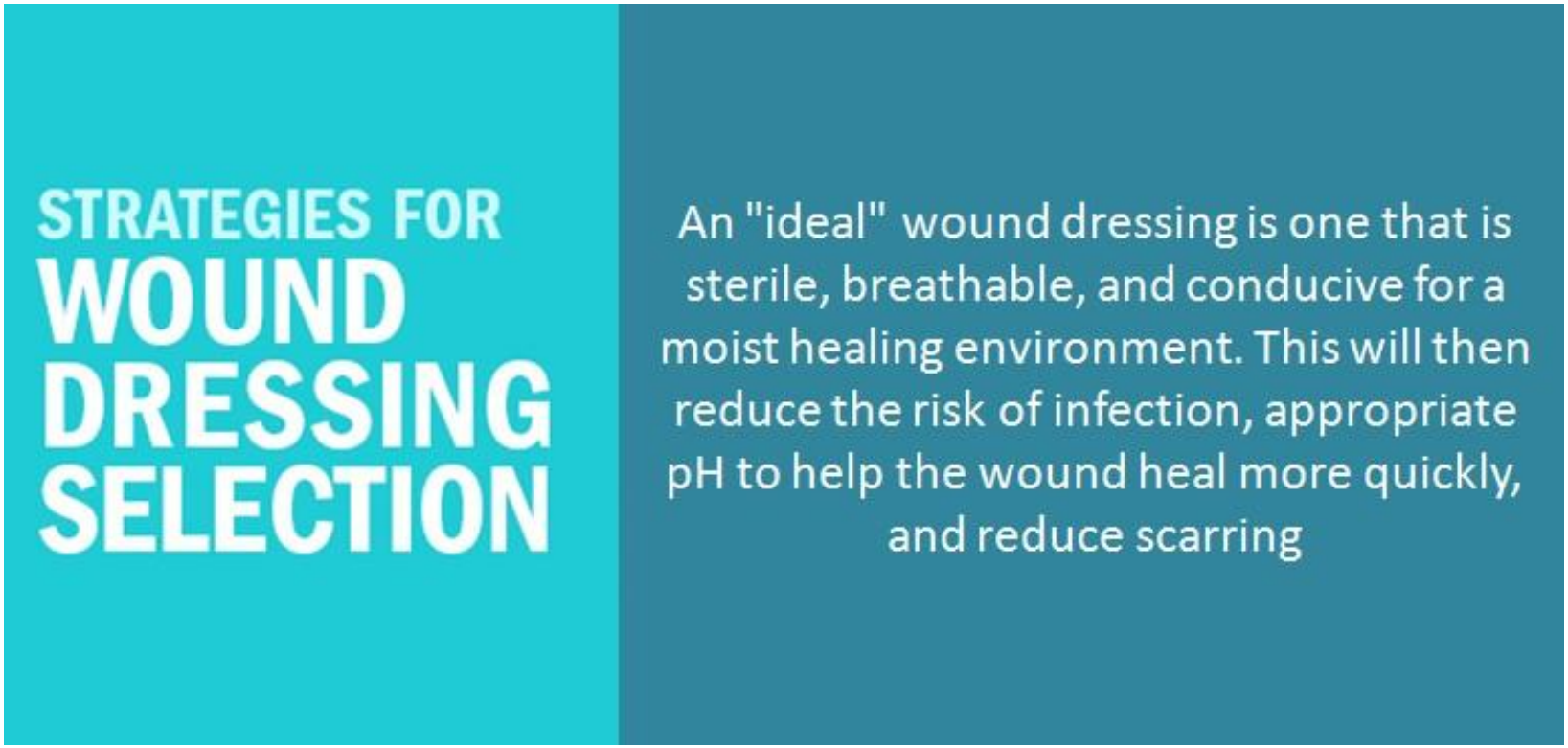
Bacterial Infection of Skin



Core purposes of a dressing

A dressing can have a number of purposes, depending on the type, severity and position of the wound, although all purposes are focused towards promoting recovery and preventing further harm from the wound. Key purposes of a dressing are:

Stem bleeding – to help to seal the wound to expedite the clotting process;

Absorb exudates – to soak up blood, plasma, and other fluids exuded from the wound, containing it/them in one place;

Ease pain – to have an actual pain-relieving effect, whereas some others may have a placebo effect;

Debride the wound – to remove slough and foreign objects from the wound;

Protection from infection – to defend the wound against germs and mechanical damage;

Promote healing – to contribute to recovery
via granulation and epithelialization; and

Reduce psychological stress – to obscure a healing wound from the view of others.

Chronic Wound Care

What Type of Wound is it? How long has it been there?

- **Acute**-generally heal in a couple weeks, but can become chronic:
  - Surgical
  - Trauma
- **Chronic**-do not heal by normal repair process-takes weeks to months:
  - Vascular-venous stasis, arterial ulcers
  - Pressure ulcers
  - Diabetic foot ulcers (neuropathic)

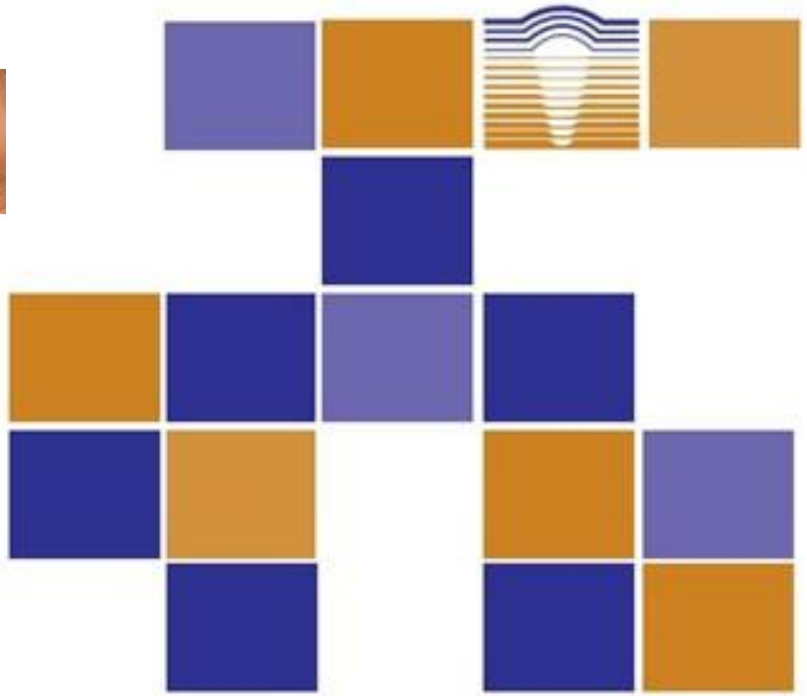
Venous Ulcer

Pressure Ulcer

Diabetic Ulcer

Arterial Insufficiency Ulcer

The most common chronic wounds



Chronic Wounds

The most common chronic wounds—pressure ulcers, venous stasis ulcers and diabetic foot ulcers—are increasing in prevalence in the U.S. population, owing primarily to an ever-increasing number of elderly patients.

Pressure Ulcer Staging

Specialty Dressings

- Antimicrobial dressings
  - **Tourmaline**
  - **Cadexomer Iodine**
- Specialty Treatments
  - **Vacuum-assisted wound tratments**
  - **Hyperbaric oxigen treatment**

Uses
Features
Change Frequency

Uses:

Absorbs drainage. (Highly absorbent)

Covers the wound.

Features:

Antimicrobial Tourmaline.

For wounds with fragile periwound skin.

Tourmaline provides antimicrobial barrier

Continuous antimicrobial protection

Conformable

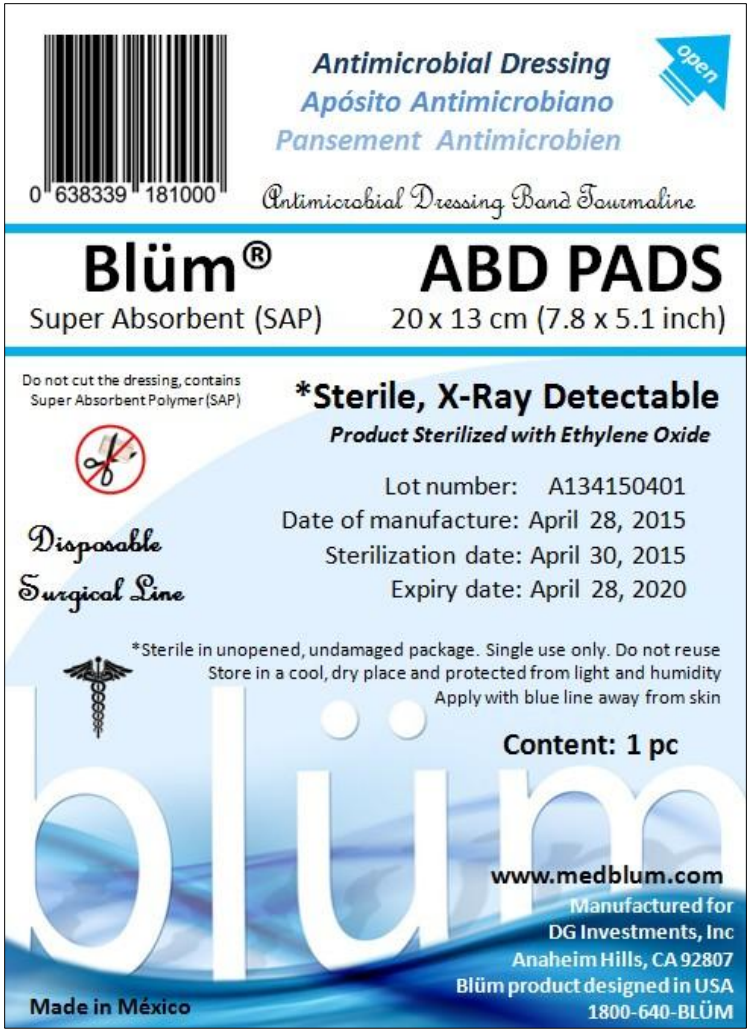
Can manage repeated bacteria introduction

Moisture vapor transmission rate (MVTR) adjusts to fluid level

Indications: pressure ulcers partial and full-thickness wounds, surgical wounds, wounds with colonization, leg ulcers, diabetic foot ulcers, donor sites, lacerations and abrasions, skin tears, first and second-degree and under compression bandages.

Contraindications: third-degreeburns, lesions with active vasculitis, individuals with a known sensitivity to tourmaline.

Change Frequency: May be left in place for up to 5 days; Dressing change frequency will depend on amount of drainage.



(Methicillin Resistant staphylococcus aureus)

MRSA

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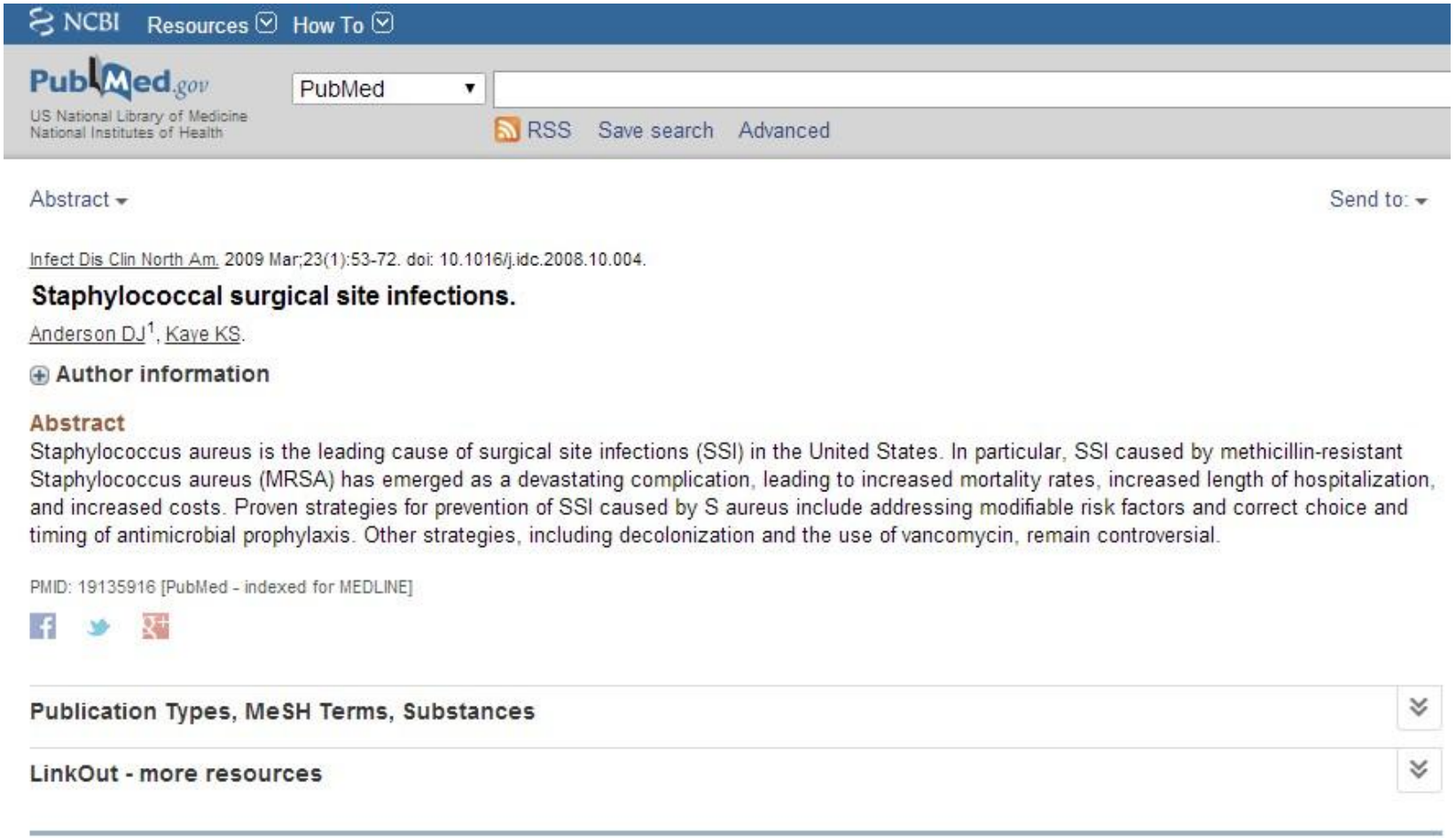
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Abstract

Send to:

Infect Dis Clin North Am. 2009 Mar;23(1):53-72. doi: 10.1016/j.idc.2008.10.004.

Staphylococcal surgical site infections.

Anderson DJ[1], Kaye KS.

Author information

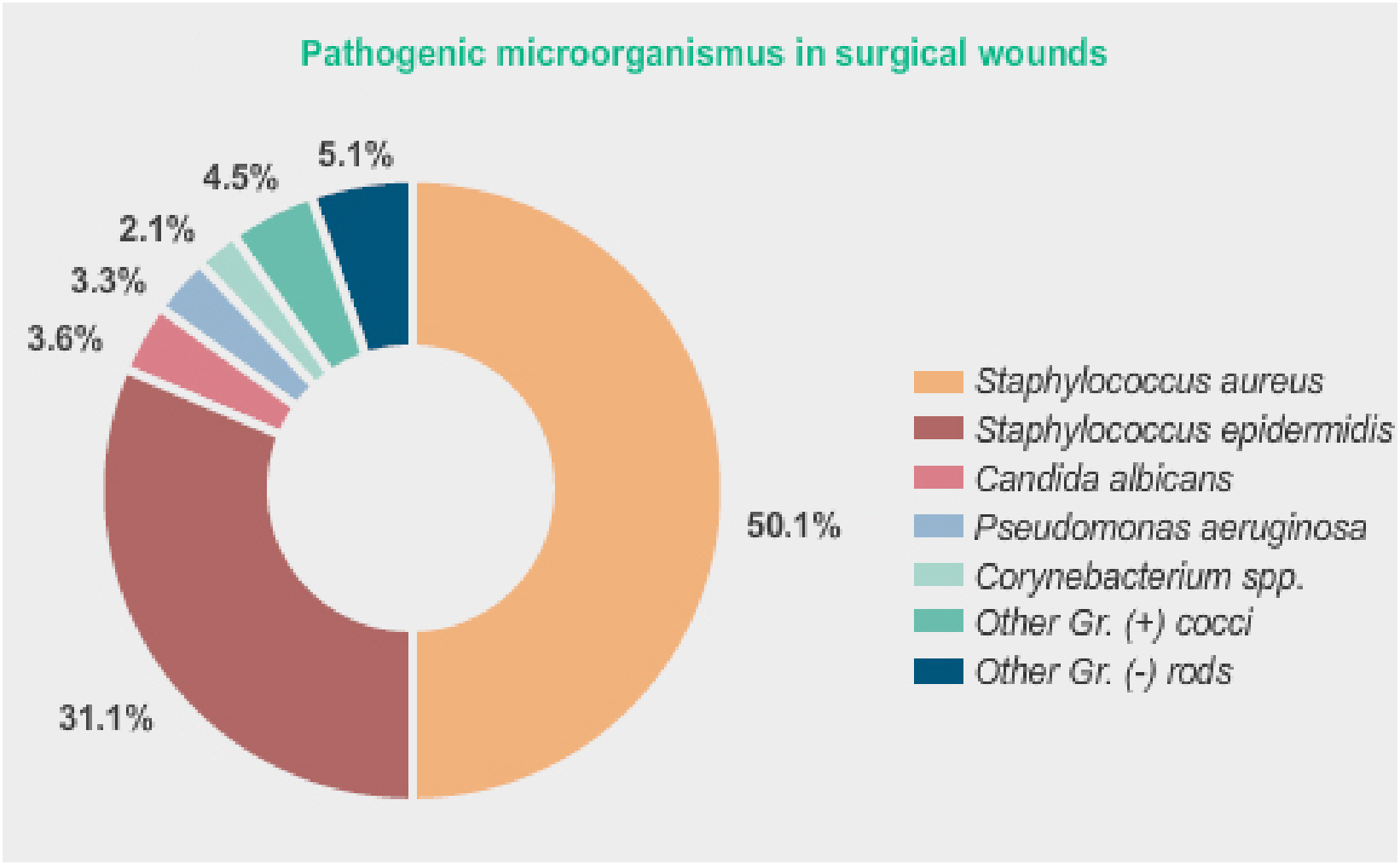
Abstract

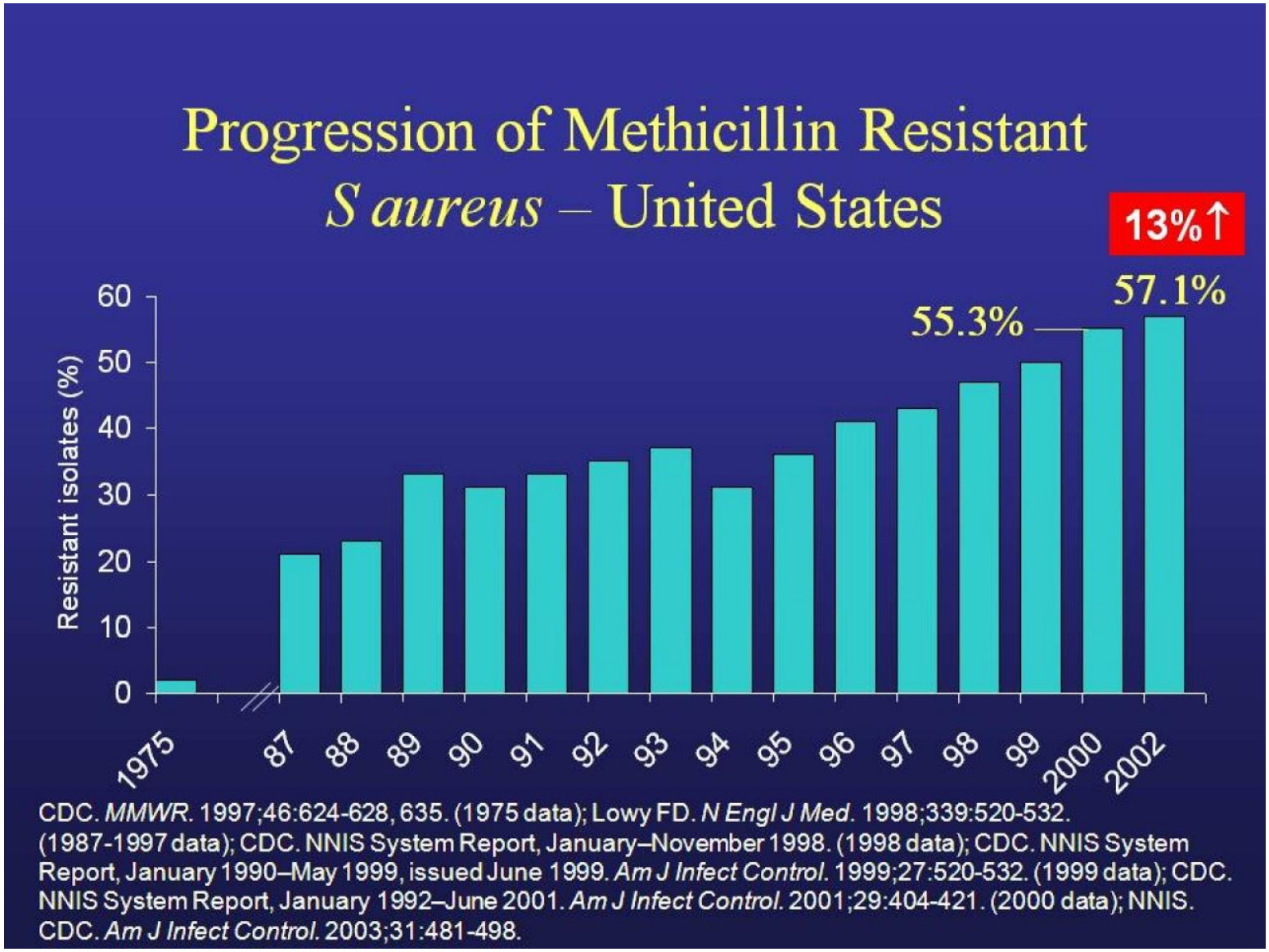
Staphylococcus aureus is the leading cause of surgical site infections (SSI) in the United States. In particular, SSI caused by methicillin-resistant Staphylococcus aureus (MRSA) has emerged as a devastating complication, leading to increased mortality rates, increased length of hospitalization, and increased costs. Proven strategies for prevention of SSI caused by S aureus include addressing modifiable risk factors and correct choice and timing of antimicrobial prophylaxis. Other strategies, including decolonization and the use of vancomycin, remain controversial.

PMID: 19135916 [PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Substances

LinkOut - more resources


Pathogenic microorganismus in surgical wounds
5.1%
4.5%
2.1%
3.3%
3.6%
50.1%
31.1%
Staphylococcus aureus
Staphylococcus epidermidis
Candida albicans
Pseudomonas aeruginosa
Corynebacterium spp.
Other Gr. (+) cocci
Other Gr. (-) rods


Progression of Methicillin Resistant
S aureus – United States
13%↑
57.1%
55.3%
Resistant isolates (%)
60
50
40
30
20
10
0
1975
87
88
89
90
91
92
93
94
95
96
97
98
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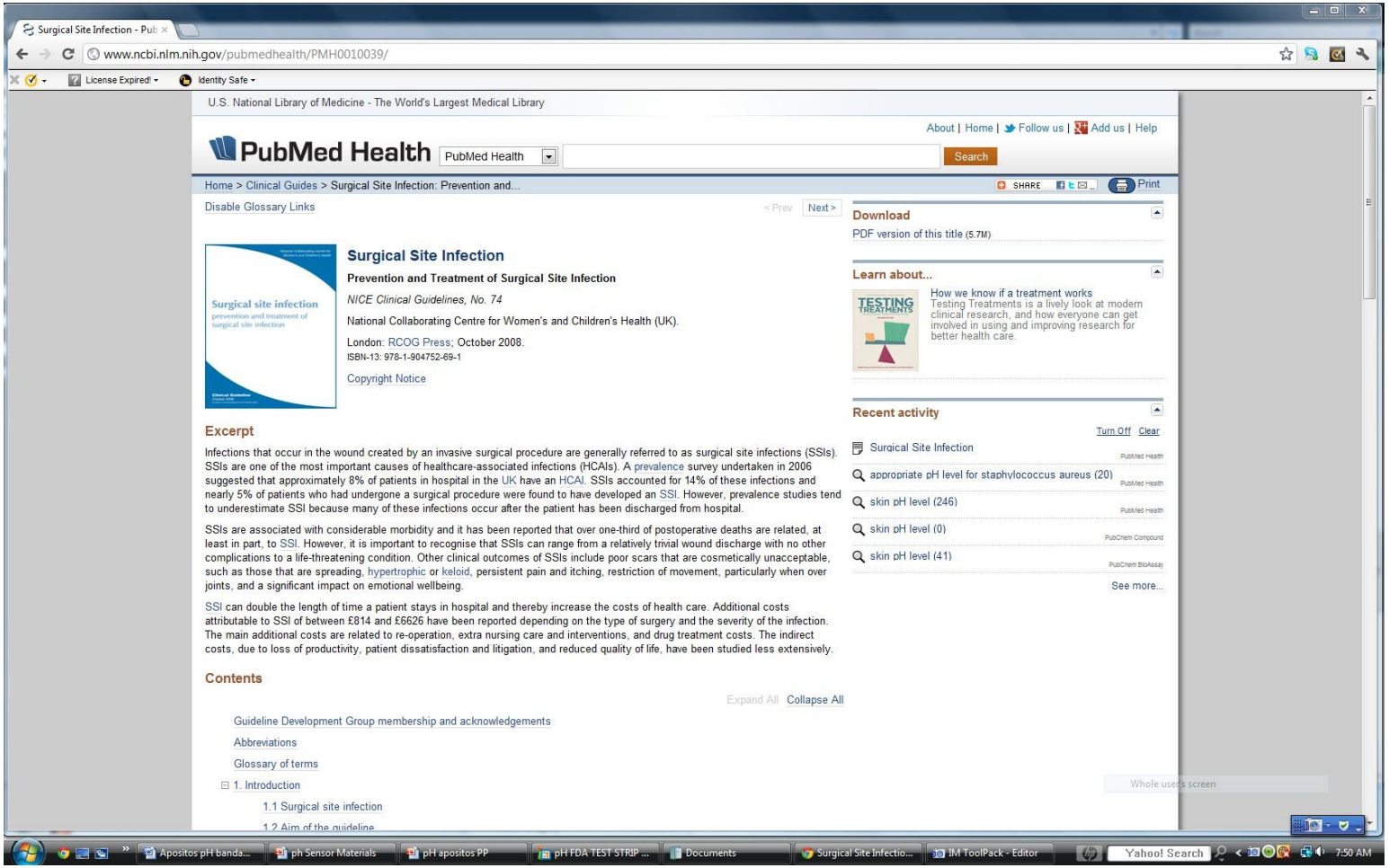
2000
2002
CDC. MMWR. 1997;46:624-628, 635. (1975 data); Lowy FD. N Engl J Med. 1998;339:520-532. (1987-1997 data); CDC. NNIS System Report, January–November 1998. (1998 data); CDC. NNIS System Report, January 1990–May 1999, issued June 1999. Am J Infect Control. 1999;27:520-532. (1999 data); CDC. NNIS System Report, January 1992–June 2001. Am J Infect Control. 2001;29:404-421. (2000 data); NNIS. CDC. Am J Infect Control. 2003;31:481-498.

Surgical Site Infection
Prevention and Treatment of Surgical Site Infection



Surgical Site Infection Prevention and Treatment of Surgical Site Infection

- Infections that occur in the wound created by an invasive surgical procedure generally refer to the surgical site infections (SSIs). The surgical site infection SSI is one of the most important causes of healthcare-associated (HAI) infections. A prevalence study conducted in 2006 suggests that approximately 8% of patients in hospital in the UK has an IRAS. SSI accounted for 14% of these infections and nearly 5% of patients who had undergone a surgical procedure were found to have developed a CSR. However, prevalence studies tend to underestimate SSI because many of these infections occur after the patient has been discharged from hospital.
- SSIs are associated with considerable morbidity and reported that more than a third of postoperative deaths are related, at least in part, to CSR however, is important to recognize that CSR can vary from relatively trivial wounds download, no other complications to a life-threatening condition. Other clinical results of SSI include poor scars are cosmetically unacceptable, such as those that are spreading, hypertrophic or keloid, persistent pain and itching, restricted movement, especially when over joints and a significant impact on the emotional wellbeing.
- SSI can double the length of time a patient stays in the hospital and thereby increasing the costs of health care. Additional costs attributable to SSI between £ 814 and £ 6,626 have been reported depending on the type of surgery and severity of infection. The main additional costs related to re-operation, nursing care and interventions, and costs of drug treatment. Indirect costs due to lost productivity, patient dissatisfaction and litigation and a lower quality of life, have been studied less extensively.

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Am J Infect Control. 2008 Nov;36(9):651-5. doi: 10.1016/j.ajic.2007.12.005. Epub 2008 Oct 3.

Impact of an antimicrobial-impregnated gauze dressing on surgical site infections including methicillin-resistant Staphylococcus aureus infections.

Mueller SW[1], Krebsbach LE.

Author information

Abstract

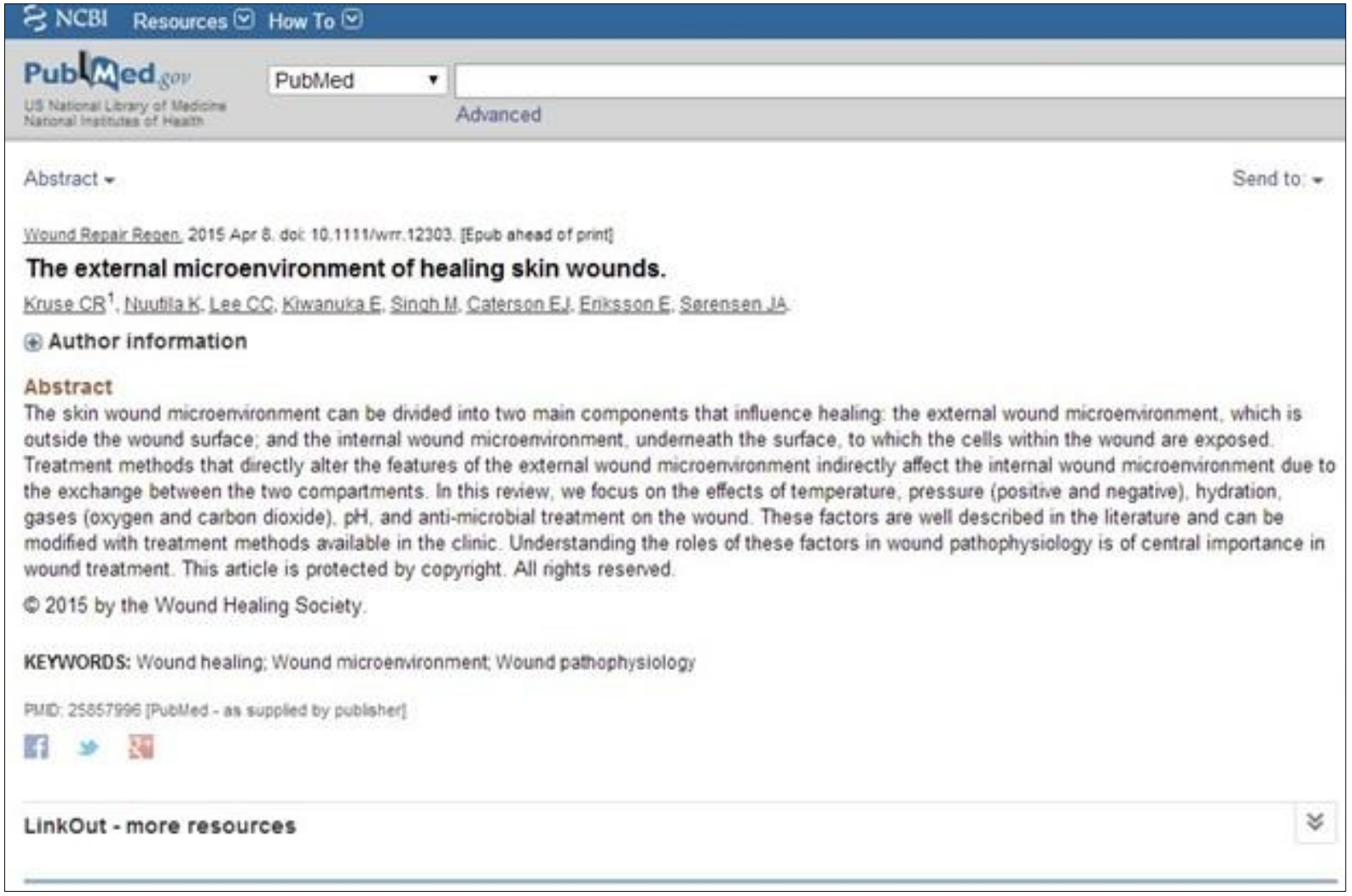
BACKGROUND: Surgical site infections (SSIs) are a common complication of surgery. Methicillin-resistant Staphylococcus aureus (MRSA) is a particularly troublesome infectious agent in this setting. SSIs contribute to increased morbidity and mortality, as well as increasing length of hospital stay and costs.

METHODS: Sterile plain gauze dressings were replaced institution-wide by a comparable sterile antimicrobial gauze dressing (AMD) impregnated with 0.2% polyhexamethylene biguaide. SSIs, and specifically MRSA-SSIs, were tracked for the 11-month periods before and after the dressing switch, using Centers for Disease Control and Prevention criteria.

RESULTS: Before the introduction of AMD, 101 SSIs occurred after 9372 surgical procedures (1.08%), 20 of which were identified as MRSA (0.21%). After introduction of AMD, 84 SSIs occurred after 10,202 surgical procedures (0.82%), representing a rate reduction of 24.07% (P = .035), with 11 identified as MRSA (0.11%), representing a reduction of 47.62% (P = .047). This reduction in SSIs represents an annual cost savings to the institution of $508,605.

CONCLUSION: A significant reduction in SSIs, and specifically MRSA-SSIs, resulted from a simple change from plain sterile gauze to a sterile comparable antimicrobial dressing. This change reduced morbidity and possibly mortality after surgery, shortened hospital stays, and reduced the costs of postsurgical care.

PMID: 18834734 [PubMed - indexed for MEDLINE]



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Abstract

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Wound Repair Regen. 2015 Apr 8. doi: 10.1111/wrr.12303. [Epub ahead of print]

The external microenvironment of healing skin wounds.

Kruse CR[1], Nuutila K, Lee CC, Kiwanuka E, Singh M, Caterson EJ, Eriksson E, Sørensen JA.

Author information

Abstract

The skin wound microenvironment can be divided into two main components that influence healing: the external wound microenvironment, which is outside the wound surface; and the internal wound microenvironment, underneath the surface, to which the cells within the wound are exposed. Treatment methods that directly alter the features of the external wound microenvironment indirectly affect the internal wound microenvironment due to the exchange between the two compartments. In this review, we focus on the effects of temperature, pressure (positive and negative), hydration, gases (oxygen and carbon dioxide), pH, and anti-microbial treatment on the wound. These factors are well described in the literature and can be modified with treatment methods available in the clinic. Understanding the roles of these factors in wound pathophysiology is of central importance in wound treatment. This article is protected by copyright. All rights reserved.

KEYWORDS: Wound healing; Wound microenvironment; Wound pathophysiology

PMID: 25857996 [PubMed - as supplied by publisher]

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Abstract

Send to:

Skin Pharmacol Physiol. 2014;27(6):283-92. doi: 10.1159/000357387. Epub 2014 Jun 26.

New strategies for preoperative skin antisepsis.

Ulmer M[1], Lademann J, Patzelt A, Knorr F, Kramer A, Koburger T, Assadian O, Daeschlein G, Lange-Asschenfeldt B.

Author information

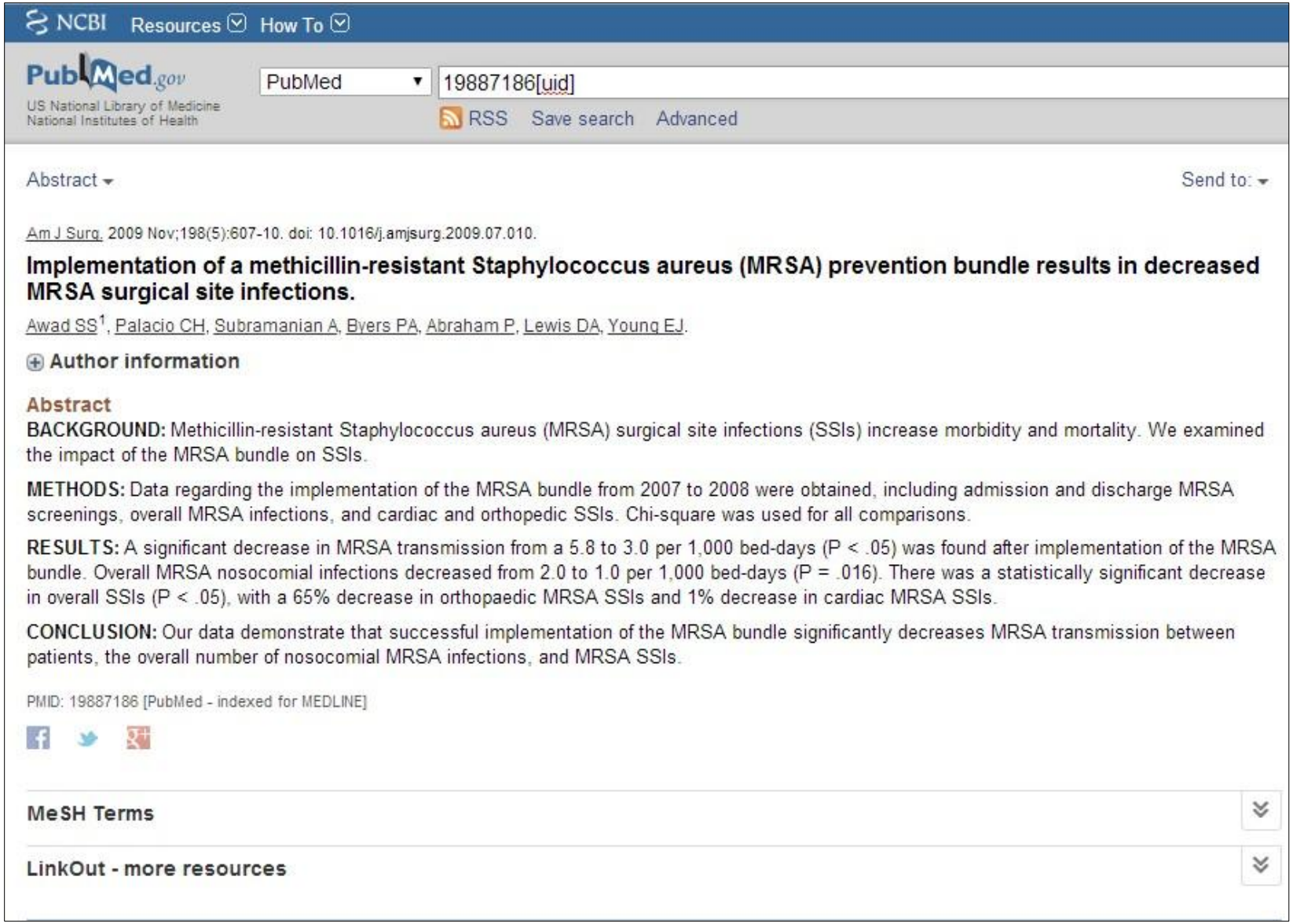
Abstract

During the past decades, encouraging progress has been made in the prevention of surgical site infections (SSI). However, as SSI still occur today, strategic prevention measures such as standardized skin antisepsis must be implemented and rigorously promoted. Recent discoveries in skin physiology necessitate the development of novel antiseptic agents and procedures in order to ameliorate their efficacy. In particular, alternate target structures in the skin need to be taken into consideration for the development of the next generation of antiseptics. Recent investigations have shown that a high number of microorganisms are located within and in the close vicinity of the hair follicles. This suggests that these structures are an important reservoir of bacterial growth and activity in human skin. To date, it has not been fully elucidated to what extent conventional liquid antiseptics sufficiently target the hair follicle-related microbial population. Modern technologies such as tissue-tolerable plasma (TTP) have been tested for their potential antiseptic efficiency by reducing the bacterial load in the skin and in the hair follicles. First experiments using liposomes to deliver antiseptics into the hair follicles have been evaluated for their potential clinical application. The present review evaluates these two innovative methods for their efficacy and applicability in preoperative skin antiseptics.

PMID: 24969555 [PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Substances

LinkOut - more resources



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PubMed 19887186[uid]

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Abstract Send to:

Am J Surg. 2009 Nov;198(5):607-10. doi: 10.1016/j.amjsurg.2009.07.010.

Implementation of a methicillin-resistant Staphylococcus aureus (MRSA) prevention bundle results in decreased MRSA surgical site infections.

Awad SS[1], Palacio CH, Subramanian A, Byers PA, Abraham P, Lewis DA, Young EJ.

Author information

Abstract

BACKGROUND: Methicillin-resistant Staphylococcus aureus (MRSA) surgical site infections (SSIs) increase morbidity and mortality. We examined the impact of the MRSA bundle on SSIs.

METHODS: Data regarding the implementation of the MRSA bundle from 2007 to 2008 were obtained, including admission and discharge MRSA screenings, overall MRSA infections, and cardiac and orthopedic SSIs. Chi-square was used for all comparisons.

RESULTS: A significant decrease in MRSA transmission from a 5.8 to 3.0 per 1,000 bed-days ($P < .05$) was found after implementation of the MRSA bundle. Overall MRSA nosocomial infections decreased from 2.0 to 1.0 per 1,000 bed-days ($P = .016$). There was a statistically significant decrease in overall SSIs ($P < .05$), with a 65% decrease in orthopaedic MRSA SSIs and 1% decrease in cardiac MRSA SSIs.

CONCLUSION: Our data demonstrate that successful implementation of the MRSA bundle significantly decreases MRSA transmission between patients, the overall number of nosocomial MRSA infections, and MRSA SSIs.

PMID: 19887186 [PubMed - indexed for MEDLINE]

MeSH Terms

LinkOut - more resources

NCBI Resources How To

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PubMed 25857996[uid]

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Abstract Send to:

Wound Repair Regen. 2015 Apr 8. doi: 10.1111/wrr.12303. [Epub ahead of print]

The external microenvironment of healing skin wounds.

Kruse CR[1], Nuutila K, Lee CC, Kiwanuka E, Singh M, Caterson EJ, Eriksson E, Sørensen JA.

Author information

Abstract

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KEYWORDS: Wound healing; Wound microenvironment; Wound pathophysiology

PMID: 25857996 [PubMed - as supplied by publisher]

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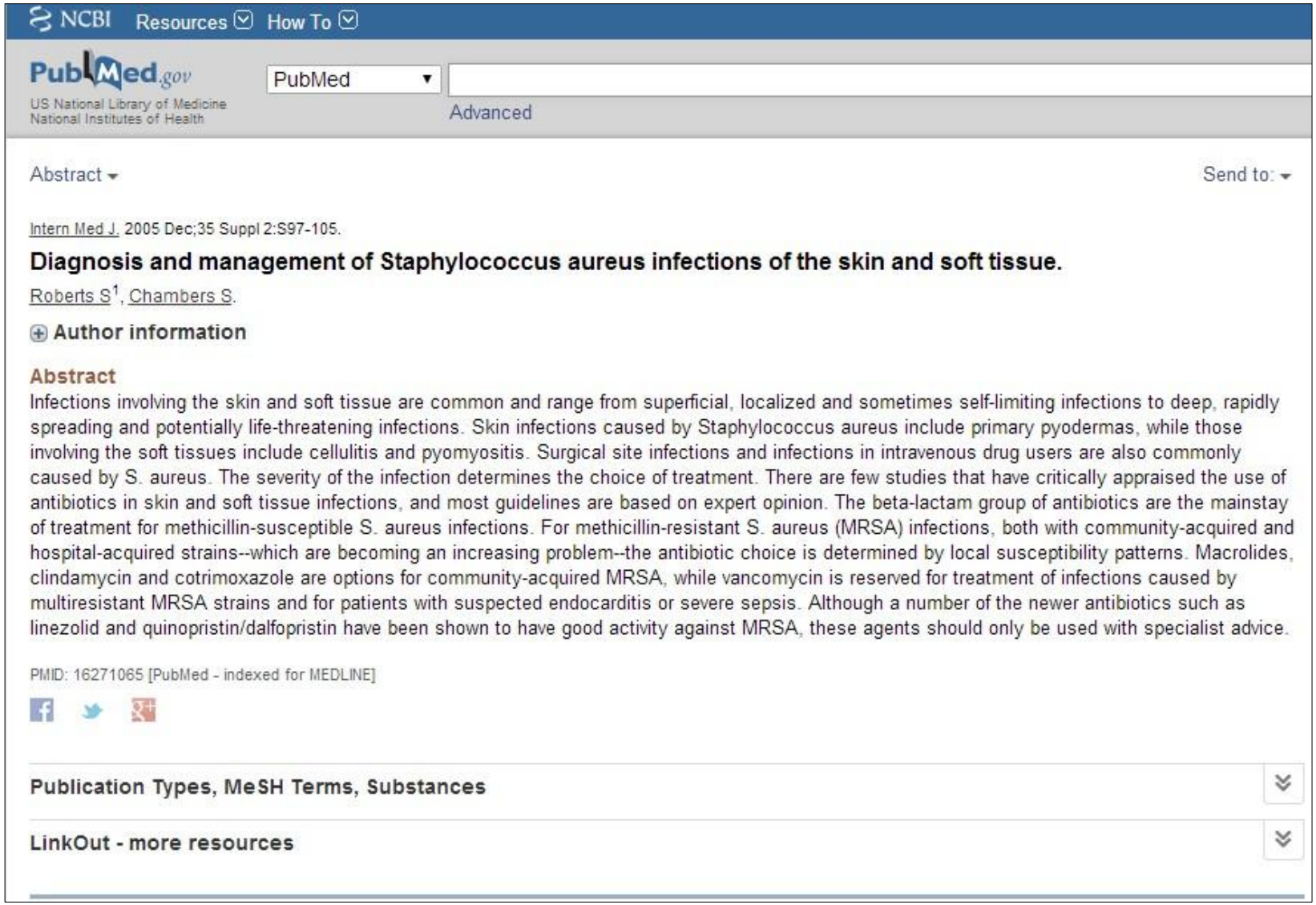
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Abstract
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Intern Med J. 2005 Dec;35 Suppl 2:S97-105.
Diagnosis and management of Staphylococcus aureus infections of the skin and soft tissue.
Roberts S[1], Chambers S.
Author information
Abstract
Infections involving the skin and soft tissue are common and range from superficial, localized and sometimes self-limiting infections to deep, rapidly spreading and potentially life-threatening infections. Skin infections caused by Staphylococcus aureus include primary pyodermas, while those involving the soft tissues include cellulitis and pyomyositis. Surgical site infections and infections in intravenous drug users are also commonly caused by S. aureus. The severity of the infection determines the choice of treatment. There are few studies that have critically appraised the use of antibiotics in skin and soft tissue infections, and most guidelines are based on expert opinion. The beta-lactam group of antibiotics are the mainstay of treatment for methicillin-susceptible S. aureus infections. For methicillin-resistant S. aureus (MRSA) infections, both with community-acquired and hospital-acquired strains--which are becoming an increasing problem--the antibiotic choice is determined by local susceptibility patterns. Macrolides, clindamycin and cotrimoxazole are options for community-acquired MRSA, while vancomycin is reserved for treatment of infections caused by multiresistant MRSA strains and for patients with suspected endocarditis or severe sepsis. Although a number of the newer antibiotics such as linezolid and quinopristin/dalfopristin have been shown to have good activity against MRSA, these agents should only be used with specialist advice.
PMID: 16271065 [PubMed - indexed for MEDLINE]
Publication Types, MeSH Terms, Substances
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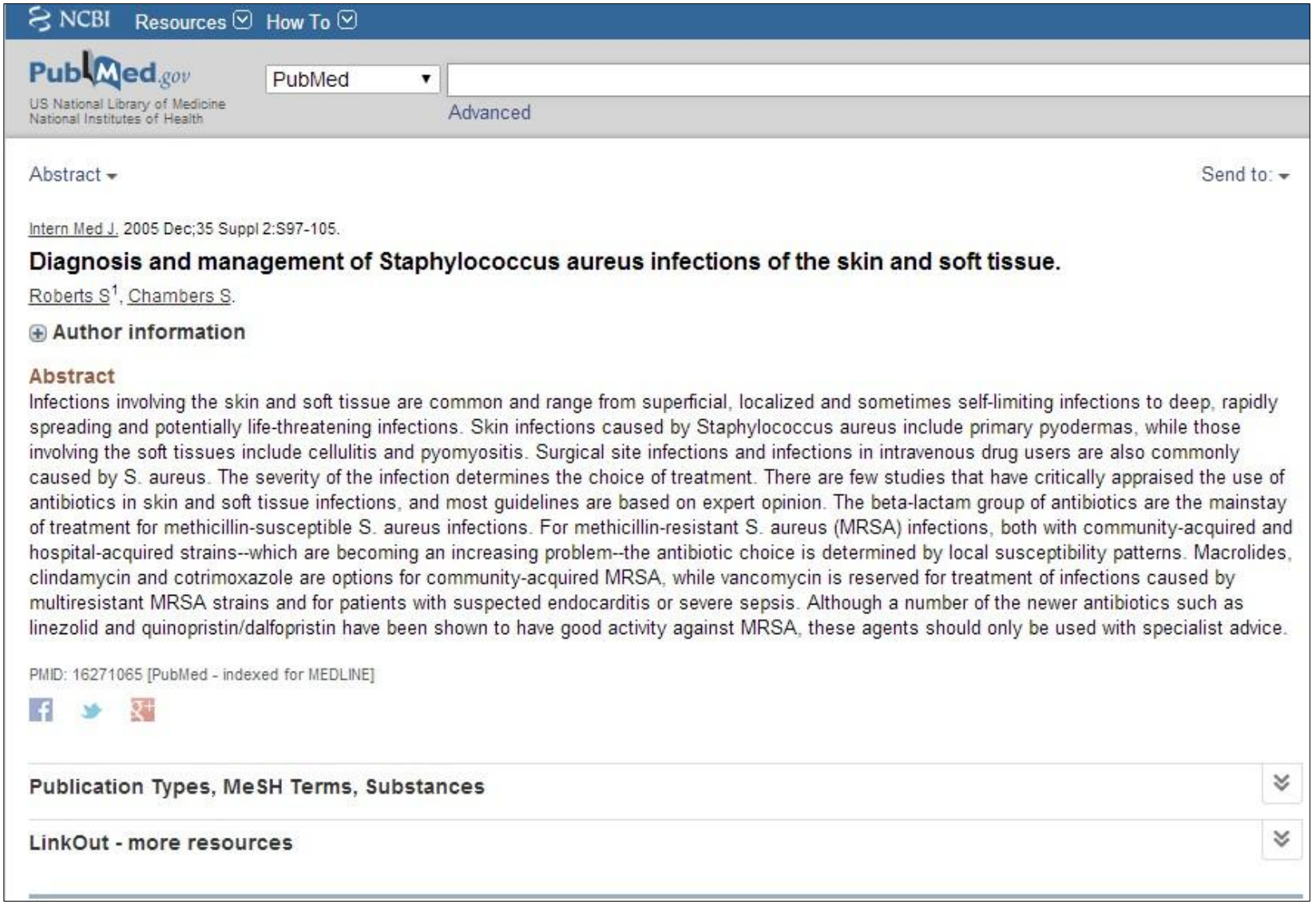

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Abstract

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Intern Med J. 2005 Dec;35 Suppl 2:S97-105.

Diagnosis and management of Staphylococcus aureus infections of the skin and soft tissue.

Roberts S[1], Chambers S.

Author information

Abstract

Infections involving the skin and soft tissue are common and range from superficial, localized and sometimes self-limiting infections to deep, rapidly spreading and potentially life-threatening infections. Skin infections caused by Staphylococcus aureus include primary pyodermas, while those involving the soft tissues include cellulitis and pyomyositis. Surgical site infections and infections in intravenous drug users are also commonly caused by S. aureus. The severity of the infection determines the choice of treatment. There are few studies that have critically appraised the use of antibiotics in skin and soft tissue infections, and most guidelines are based on expert opinion. The beta-lactam group of antibiotics are the mainstay of treatment for methicillin-susceptible S. aureus infections. For methicillin-resistant S. aureus (MRSA) infections, both with community-acquired and hospital-acquired strains--which are becoming an increasing problem--the antibiotic choice is determined by local susceptibility patterns. Macrolides, clindamycin and cotrimoxazole are options for community-acquired MRSA, while vancomycin is reserved for treatment of infections caused by multiresistant MRSA strains and for patients with suspected endocarditis or severe sepsis. Although a number of the newer antibiotics such as linezolid and quinopristin/dalfopristin have been shown to have good activity against MRSA, these agents should only be used with specialist advice.

PMID: 16271065 [PubMed - indexed for MEDLINE]

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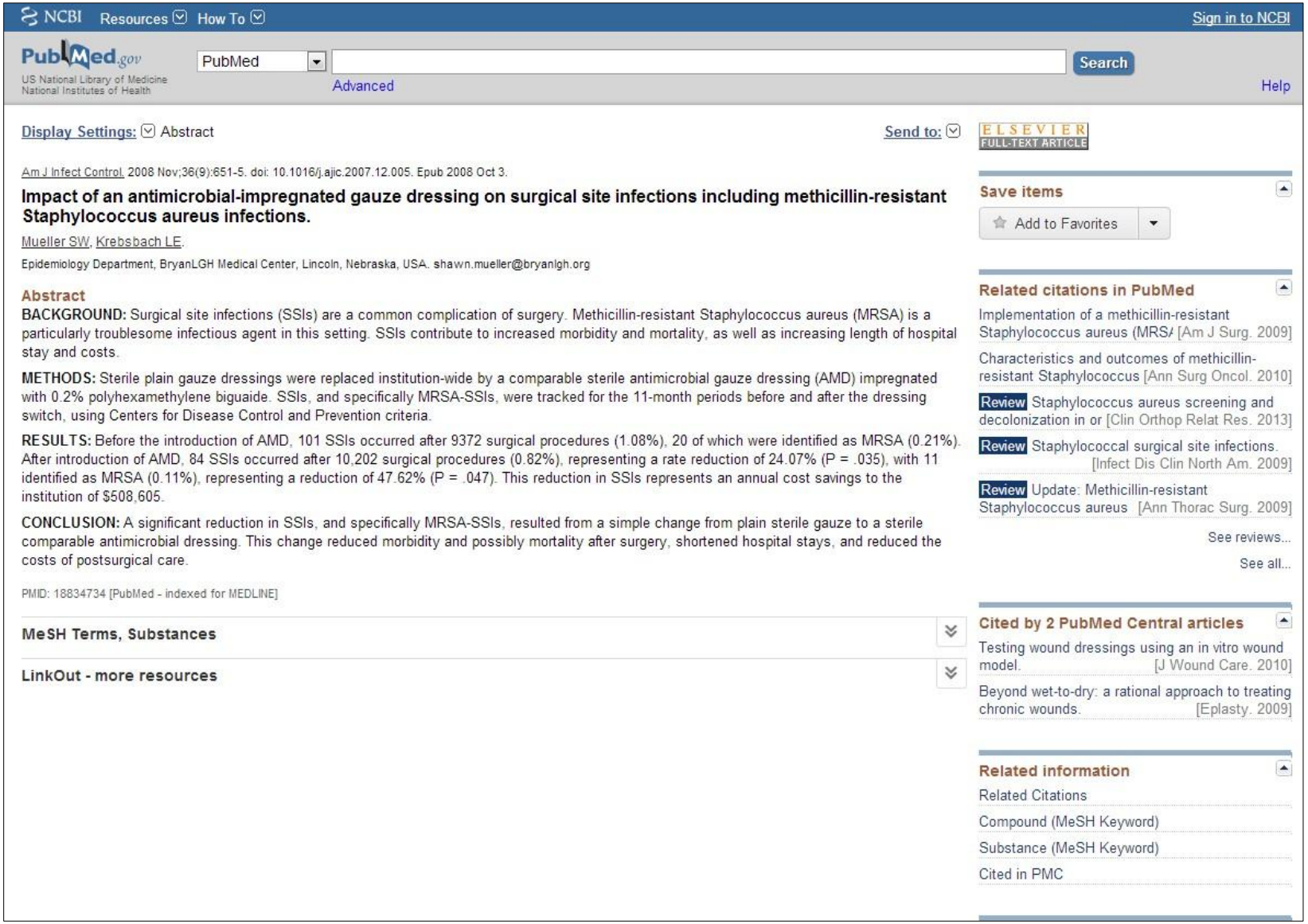

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ELSEVIER FULL-TEXT ARTICLE

Am J Infect Control. 2008 Nov;36(9):651-5. doi: 10.1016/j.ajic.2007.12.005. Epub 2008 Oct 3.

Impact of an antimicrobial-impregnated gauze dressing on surgical site infections including methicillin-resistant Staphylococcus aureus infections.

Mueller SW, Krebsbach LE.

Epidemiology Department, BryanLGH Medical Center, Lincoln, Nebraska, USA. shawn.mueller@bryanlgh.org

Abstract

BACKGROUND: Surgical site infections (SSIs) are a common complication of surgery. Methicillin-resistant Staphylococcus aureus (MRSA) is a particularly troublesome infectious agent in this setting. SSIs contribute to increased morbidity and mortality, as well as increasing length of hospital stay and costs.

METHODS: Sterile plain gauze dressings were replaced institution-wide by a comparable sterile antimicrobial gauze dressing (AMD) impregnated with 0.2% polyhexamethylene biguaide. SSIs, and specifically MRSA-SSIs, were tracked for the 11-month periods before and after the dressing switch, using Centers for Disease Control and Prevention criteria.

RESULTS: Before the introduction of AMD, 101 SSIs occurred after 9372 surgical procedures (1.08%), 20 of which were identified as MRSA (0.21%). After introduction of AMD, 84 SSIs occurred after 10,202 surgical procedures (0.82%), representing a rate reduction of 24.07% (P = .035), with 11 identified as MRSA (0.11%), representing a reduction of 47.62% (P = .047). This reduction in SSIs represents an annual cost savings to the institution of $508,605.

CONCLUSION: A significant reduction in SSIs, and specifically MRSA-SSIs, resulted from a simple change from plain sterile gauze to a sterile comparable antimicrobial dressing. This change reduced morbidity and possibly mortality after surgery, shortened hospital stays, and reduced the costs of postsurgical care.

PMID: 18834734 [PubMed - indexed for MEDLINE]

MeSH Terms, Substances

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Implementation of a methicillin-resistant Staphylococcus aureus (MRSA [Am J Surg. 2009]

Characteristics and outcomes of methicillin-resistant Staphylococcus [Ann Surg Oncol. 2010]

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Testing wound dressings using an in vitro wound model. [J Wound Care. 2010]

Beyond wet-to-dry: a rational approach to treating chronic wounds. [Eplasty. 2009]

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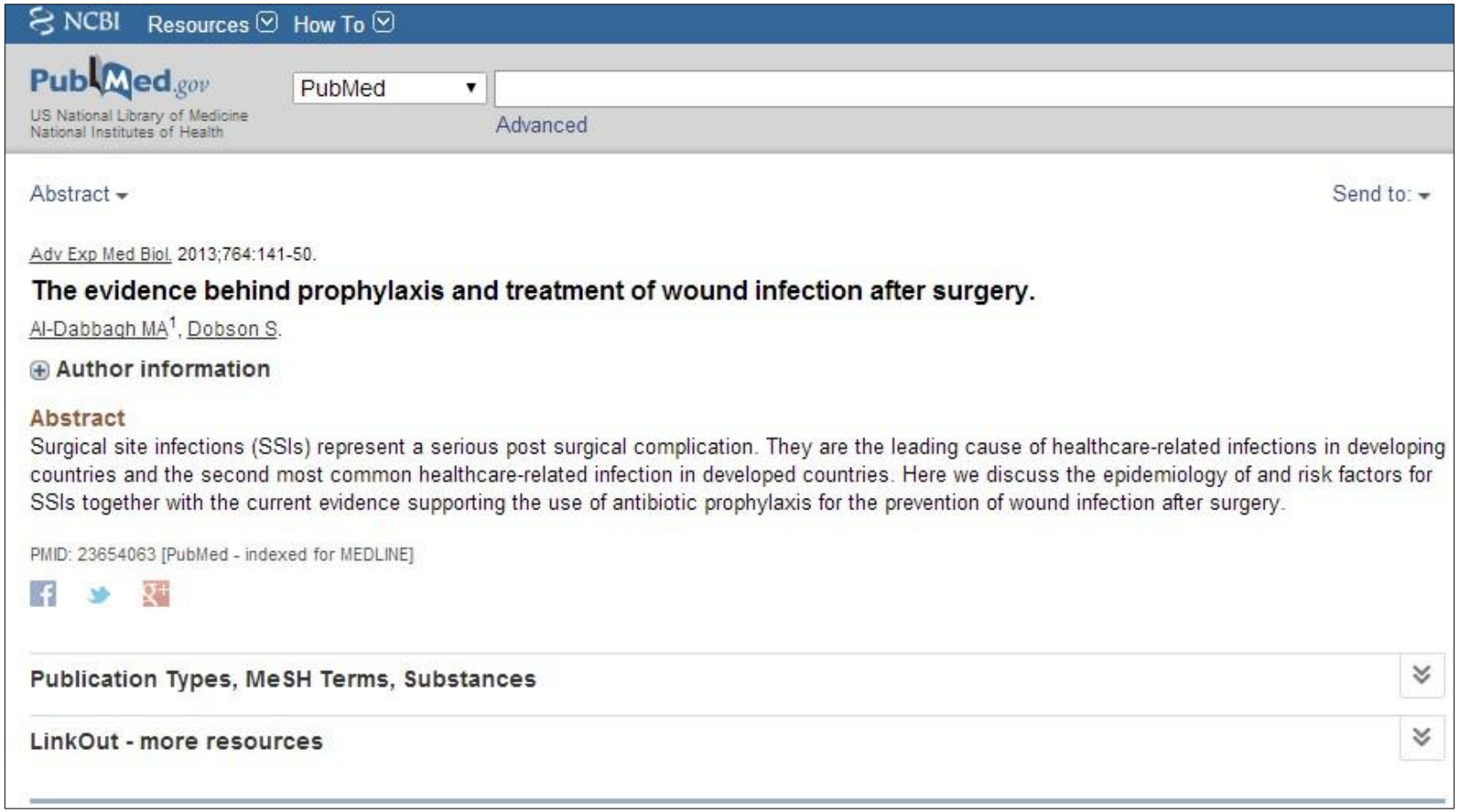
Substance (MeSH Keyword)

Cited in PMC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Adv Exp Med Biol. 2013;764:141-50.
The evidence behind prophylaxis and treatment of wound infection after surgery.
Al-Dabbagh MA[1], Dobson S.
Author information
Abstract
Surgical site infections (SSIs) represent a serious post surgical complication. They are the leading cause of healthcare-related infections in developing countries and the second most common healthcare-related infection in developed countries. Here we discuss the epidemiology of and risk factors for SSIs together with the current evidence supporting the use of antibiotic prophylaxis for the prevention of wound infection after surgery.
PMID: 23654063 [PubMed - indexed for MEDLINE]
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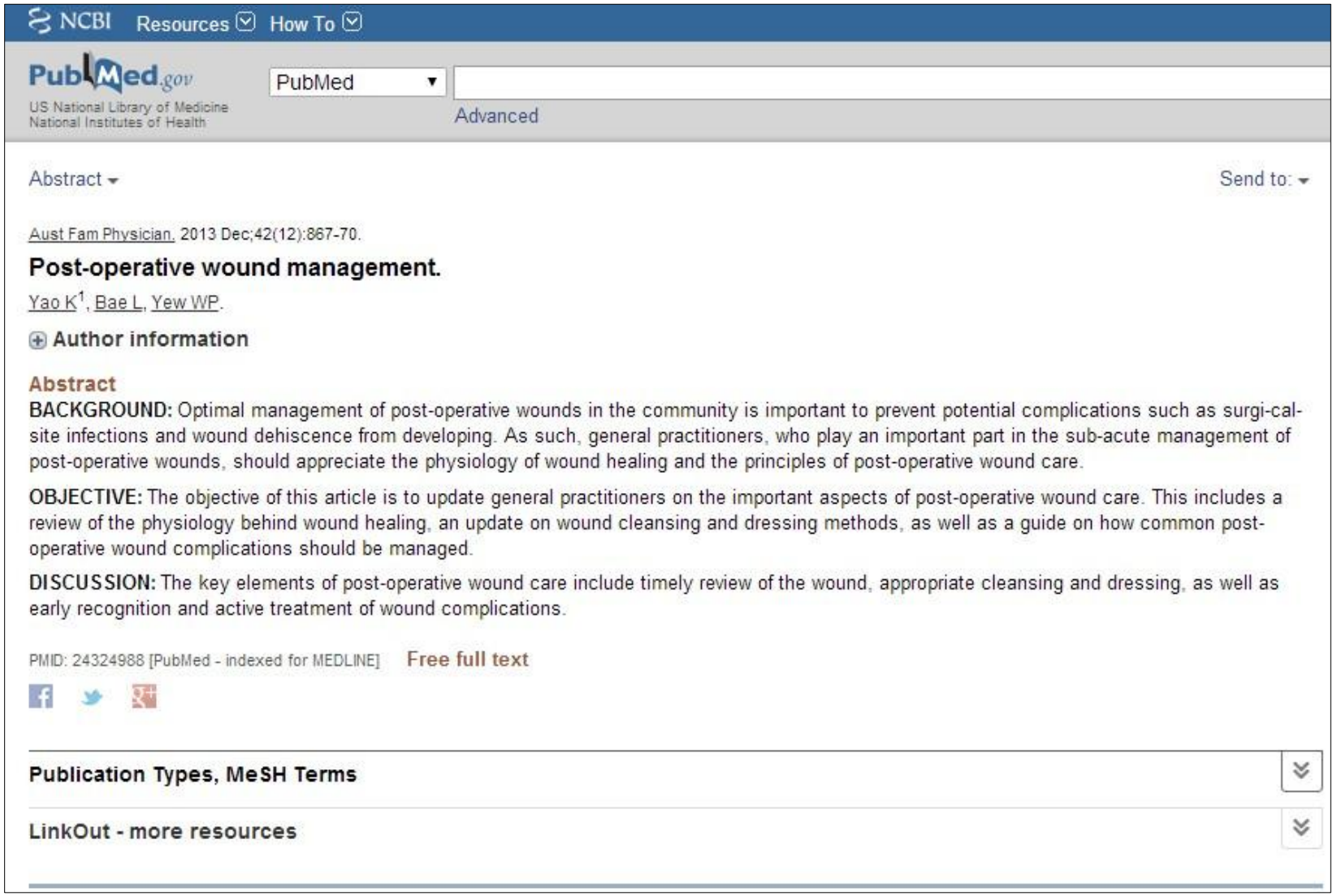

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Aust Fam Physician. 2013 Dec;42(12):867-70.

Post-operative wound management.

Yao K[1], Bae L, Yew WP.

Author information

Abstract

BACKGROUND: Optimal management of post-operative wounds in the community is important to prevent potential complications such as surgi-cal-site infections and wound dehiscence from developing. As such, general practitioners, who play an important part in the sub-acute management of post-operative wounds, should appreciate the physiology of wound healing and the principles of post-operative wound care.

OBJECTIVE: The objective of this article is to update general practitioners on the important aspects of post-operative wound care. This includes a review of the physiology behind wound healing, an update on wound cleansing and dressing methods, as well as a guide on how common post-operative wound complications should be managed.

DISCUSSION: The key elements of post-operative wound care include timely review of the wound, appropriate cleansing and dressing, as well as early recognition and active treatment of wound complications.

PMID: 24324988 [PubMed - indexed for MEDLINE]

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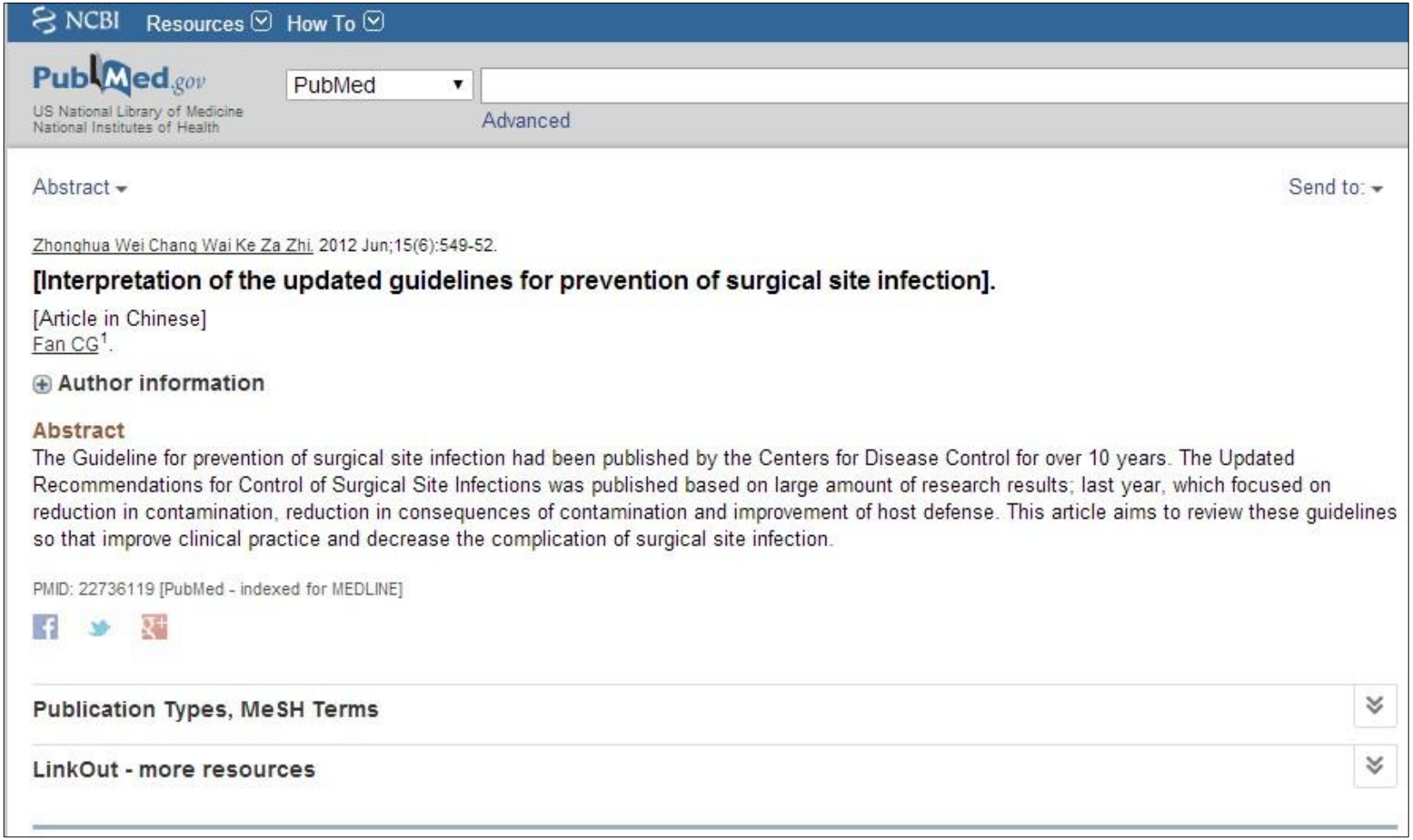
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Zhonghua Wei Chang Wai Ke Za Zhi. 2012 Jun;15(6):549-52.
[Interpretation of the updated guidelines for prevention of surgical site infection].
[Article in Chinese]
Fan CG[1].
Author information
Abstract
The Guideline for prevention of surgical site infection had been published by the Centers for Disease Control for over 10 years. The Updated Recommendations for Control of Surgical Site Infections was published based on large amount of research results; last year, which focused on reduction in contamination, reduction in consequences of contamination and improvement of host defense. This article aims to review these guidelines so that improve clinical practice and decrease the complication of surgical site infection.
PMID: 22736119 [PubMed - indexed for MEDLINE]
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J Thorac Cardiovasc Surg. 2015 Jan;149(1):323-8. doi: 10.1016/j.jtcvs.2014.08.076. Epub 2014 Sep 17.

Changing glucose control target and risk of surgical site infection in a Southeast Asian population.

Ng RR[1], Myat Oo A[2], Liu W[1], Tan TE[3], Ti LK[4], Chew ST[5].

Author information

Abstract

OBJECTIVE: Hyperglycemia is associated with surgical site infection and mortality in cardiac surgical patients. There is overriding evidence that glycemic control improves morbidity and mortality. However, the optimal glucose range in these patients remains controversial. Intensive glucose control can lead to mortality among critically ill adults because of episodic, moderate hypoglycemia. Therefore, we examined the effect of different glucose target control on the incidence of surgical site infection in our prospective cohort of diabetic and nondiabetic patients undergoing coronary artery bypass grafting.

METHODS: Data from 1442 patients who underwent elective coronary artery bypass grafting at a tertiary heart center in Singapore from 2009 to 2011 were obtained. The first glucose level on arrival in the cardiothoracic intensive care unit was set at 4 to 8 mmol/L in 2009 and 2010 and 4 to 10 mmol/L in 2011. Glucose control was achieved with intravenous insulin infusion with a strict glucose monitoring protocol. Clinical covariates were analyzed, with surgical site infection as the primary outcome.

RESULTS: The majority of patients presenting for coronary artery bypass grafting were male, Chinese, and diabetic. Diabetic patients had significantly higher glucose levels on arrival in the cardiothoracic intensive care unit. The change in target glucose control was independently associated with an increase in surgical site infection (odds ratio, 2.280; 95% confidence interval, 1.250-4.162; P = .007). Subgroup analysis revealed that unlike in nondiabetic patients, a less stringent target was independently associated with a significant increase in surgical site infection incidence from 2.2% to 6.9% for the diabetic patients (odds ratio, 3.131; 95% confidence interval, 1.431-6.851; P = .004).

CONCLUSIONS: A target blood glucose of less than 8 mmol/L was associated with a lower incidence of surgical site infection in diabetic patients presenting for elective coronary artery bypass grafting in the local Southeast Asian population.

Comment in

The pros and cons of intensive insulin therapy. [J Thorac Cardiovasc Surg. 2015]

PMID: 25439770 [PubMed - indexed for MEDLINE]

MeSH Terms, Substances

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Adv Exp Med Biol. 2015;830:47-67. doi: 10.1007/978-3-319-11038-7_3.

Clinical and microbiological aspects of biofilm-associated surgical site infections.

Edmiston CE Jr[1], McBain AJ, Roberts C, Leaper D.

Author information

Abstract

While microbial biofilms have been recognized as being ubiquitous in nature for the past 40 years, it has only been within the past 20 years that clinical practitioners have realized that biofilm play a significant role in both device-related and tissue-based infections. The global impact of surgical site infections (SSIs) is monumental and as many as 80 % of these infections may involve a microbial biofilm. Recent studies suggest that biofilm-producing organisms play a significant role in persistent skin and soft tissue wound infections in the postoperative surgical patient population. Biofilm, on an organizational level, allows bacteria to survive intrinsic and extrinsic defenses that would inactivate the dispersed (planktonic) bacteria. SSIs associated with biomedical implants are notoriously difficult to eradicate using antibiotic regimens that would typically be effective against the same bacteria growing under planktonic conditions. This biofilm-mediated phenomenon is characterized as antimicrobial recalcitrance, which is associated with the survival of a subset of cells including "persister" cells. The ideal method to manage a biofilm-mediated surgical site wound infection is to prevent it from occurring through rational use of antibiotic prophylaxis, adequate skin antisepsis prior to surgery and use of innovative in-situ irrigation procedures; together with antimicrobial suture technology in an effort to promote wound hygiene at the time of closure; once established, biofilm removal remains a significant clinical problem.

PMID: 25366220 [PubMed - indexed for MEDLINE]

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Am J Clin Nutr. 2014 Nov;100(5):1337-43. doi: 10.3945/ajcn.114.088609. Epub 2014 Sep 3.

Hypocaloric compared with eucaloric nutritional support and its effect on infection rates in a surgical intensive care unit: a randomized controlled trial.

Charles EJ[1], Petroze RT[1], Metzger R[1], Hranjec T[1], Rosenberger LH[1], Riccio LM[1], McLeod MD[1], Guidry CA[1], Stukenborg GJ[1], Swenson BR[1], Willcutts KF[1], O'Donnell KB[1], Sawyer RG[1].

Author information

Abstract

BACKGROUND: Proper caloric intake goals in critically ill surgical patients are unclear. It is possible that overnutrition can lead to hyperglycemia and an increased risk of infection.

OBJECTIVE: This study was conducted to determine whether surgical infection outcomes in the intensive care unit (ICU) could be improved with the use of hypocaloric nutritional support.

DESIGN: Eighty-three critically ill patients were randomly allocated to receive either the standard calculated daily caloric requirement of 25-30 kcal · kg(-1) · d(-1) (eucaloric) or 50% of that value (hypocaloric) via enteral tube feeds or parenteral nutrition, with an equal protein allocation in each group (1.5 g · kg(-1) · d(-1)).

RESULTS: There were 82 infections in the hypocaloric group and 66 in the eucaloric group, with no significant difference in the mean (± SE) number of infections per patient (2.0 ± 0.6 and 1.6 ± 0.2, respectively; P = 0.50), percentage of patients acquiring infection [70.7% (29 of 41) and 76.2% (32 of 42), respectively; P = 0.57], mean ICU length of stay (16.7 ± 2.7 and 13.5 ± 1.1 d, respectively; P = 0.28), mean hospital length of stay (35.2 ± 4.9 and 31.0 ± 2.5 d, respectively; P = 0.45), mean 0600 glucose concentration (132 ± 2.9 and 135 ± 3.1 mg/dL, respectively; P = 0.63), or number of mortalities [3 (7.3%) and 4 (9.5%), respectively; P = 0.72]. Further analyses revealed no differences when analyzed by sex, admission diagnosis, site of infection, or causative organism.

CONCLUSIONS: Among critically ill surgical patients, caloric provision across a wide acceptable range does not appear to be associated with major outcomes, including infectious complications. The optimum target for caloric provision remains elusive.

PMID: 25332331 [PubMed - indexed for MEDLINE] PMCID: PMC4196484 [Available on 2015-11-01]

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Abstract

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Gynecol Oncol. 2015 Jan;136(1):71-6. doi: 10.1016/j.ygyno.2014.09.013. Epub 2014 Sep 28.

Intensive postoperative glucose control reduces the surgical site infection rates in gynecologic oncology patients.

Al-Niaimi AN[1], Ahmed M[2], Burish N[3], Chackmakchy SA[3], Seo S[4], Rose S[3], Hartenbach E[3], Kushner DM[3], Safdar N[5], Rice L[3], Connor J[3].

Author information

Abstract

OBJECTIVE: SSI rates after gynecologic oncology surgery vary from 5% to 35%, but are up to 45% in patients with diabetes mellitus (DM). Strict postoperative glucose control by insulin infusion has been shown to lower morbidity, but not specifically SSI rates. Our project studied continuous postoperative insulin infusion for 24h for gynecologic oncology patients with DM and hyperglycemia with a target blood glucose of <139 mL/dL and a primary outcome of the protocol's impact on SSI rates.

METHODS: We compared SSI rates retrospectively among three groups. Group 1 was composed of patients with DM whose blood glucose was controlled with intermittent subcutaneous insulin injections. Group 2 was composed of patients with DM and postoperative hyperglycemia whose blood glucose was controlled by insulin infusion. Group 3 was composed of patients with neither DM nor hyperglycemia. We controlled for all relevant factors associated with SSI.

RESULTS: We studied a total of 372 patients. Patients in Group 2 had an SSI rate of 26/135 (19%), similar to patients in Group 3 whose rate was 19/89 (21%). Both were significantly lower than the SSI rate (43/148, 29%) of patients in Group 1. This reduction of 35% is significant (p = 0.02). Multivariate analysis showed an odd ratio = 0.5 (0.28-0.91) in reducing SSI rates after instituting this protocol.

CONCLUSIONS: Initiating intensive glycemic control for 24h after gynecologic oncology surgery in patients with DM and postoperative hyperglycemia lowers the SSI rate by 35% (OR = 0.5) compared to patients receiving intermittent sliding scale insulin and to a rate equivalent to non-diabetics.

KEYWORDS: Diabetes mellitus; Gynecologic oncology surgery; Intensive glycemic control; Post operative morbidity; Surgical outcome; Surgical site infection

PMID: 25263249 [PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Substances, Grant Support

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J Bone Joint Surg Am. 2014 Sep 17;96(18):e158. doi: 10.2106/JBJS.M.01363.

Risk factors for surgical site infection following total joint arthroplasty.

Rasouli MR[1], Restrepo C[1], Maltenfort MG[1], Purtill JJ[1], Parvizi J[1].

Author information

Abstract

BACKGROUND: Currently, most hospitals in the United States are obliged to report infections that occur following total joint arthroplasty to the Centers for Disease Control and Prevention through the National Healthcare Safety Network surveillance. The objective of this study was to identify the risk factors of surgical site infections that were reported to the Centers for Disease Control and Prevention from a single institution.

METHODS: For this study, 6111 primary and revision total joint arthroplasties performed from April 2010 to June 2012 were identified. Surgical site infection cases captured by infection surveillance staff on the basis of the Centers for Disease Control and Prevention definition were identified. Surgical site infection cases with index surgery performed at another institution were excluded. All cases were followed up for one year for development of surgical site infection. The model for predictors of surgical site infection was created by logistic regression and was validated by bootstrap resampling.

RESULTS: Of all performed total joint arthroplasties, surgical site infection developed in eighty cases (1.31% [95% confidence interval, 1.02% to 1.59%]). The highest rate of surgical site infection was observed in revision total knee arthroplasty (4.57% [95% confidence interval, 2.31% to 6.83%]) followed by revision total hip arthroplasty (1.94% [95% confidence interval, 0.75% to 3.13%]). Among the variables examined, the predictive factors of surgical site infection were higher Charlson Comorbidity Index (odds ratio for a Charlson Comorbidity Index of ≥ 2, 2.29 [95% confidence interval, 1.32 to 3.94] and odds ratio for a Charlson Comorbidity Index of 1, 2.09 [95% confidence interval, 1.06 to 4.10]), male sex (odds ratio, 1.79 [95% confidence interval, 1.11 to 2.89]), and revision total knee arthroplasty (odds ratio, 3.13 [95% confidence interval, 1.17 to 8.34]), and a higher level of preoperative hemoglobin (odds ratio, 0.85 per point [95% confidence interval, 0.73 to 0.98 per point]) was protective against surgical site infection. The C-statistic of the model was 0.709 without correction and 0.678 after bootstrap correction, indicating that the model has fair predictive power.

CONCLUSIONS: Low preoperative hemoglobin level is one of the risk factors for surgical site infection and preoperative correction of hemoglobin may reduce the likelihood of postoperative surgical site infection.

LEVEL OF EVIDENCE: Prognostic Level IV. See Instructions for Authors for a complete description of levels of evidence.

PMID: 25232088 [PubMed - indexed for MEDLINE]

Bibliography

↑ Dr. Jose Zavala, Editor of literature: "*pH of the skin and Surgical Site Infections (SSIs)*", Los Angeles, CA 2015.

Annotated bibliographies and listed with the description of other sources: PubMed, National Institutes of Health and United States National Library of Medicine. Building protocols or arguments that are useful for science. Creating these annotations, in order to enrich the content of the article cited, extending its information. In accordance with this descriptive and interpretive criteria and other scientific sources.

Dr. Jose Zavala professionally licensed in Mexico as Surgeon and Obstetrician and represents Blüm® worldwide.

Medical Research

Postpartum Recovery Pads

Regular Female Pads

{BLÜM}

During menstruation, a woman's most sensitive areas of the skin are vulnerable to pH changes, and the reproductive and urinary system is also particularly vulnerable to the invasion of bacteria and viruses. Choosing high-quality sanitary pads will not only promote safe and effective hygiene, but will also assist in maintaining the highest degree of gynecological health.

{BLÜM}

Presented by:
Dr. Jose Zavala
Research Medical Director
Medblüm & Blüm

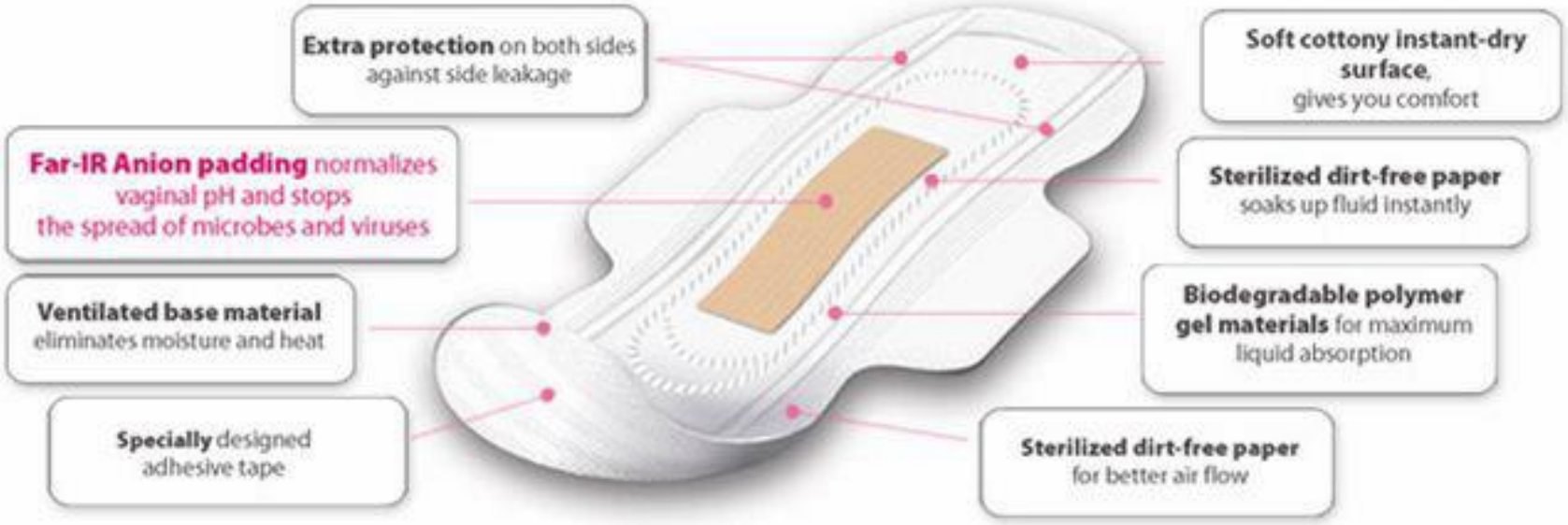
DG Investments, Inc. mission is to provide the highest quality sanitary pads and support women's comfort and healthy well-being. **Blüm pads are a new generation of sanitary pads with NEW nanotechnology.** The pads can be used not only for feminine hygiene, but are useful as support help for various gynecological conditions. **Blüm sanitary pads** have several main characteristics that make them unique:

*Quickly absorbs and locks in moisture, keeping surface dry **
*Permeable to air, which allows the skin to breathe**
*Thin, soft, gentle and very comfortable to wear**
*Encourages and supports normal healthy skin and feeling of personal freshness**

Blüm pads have three important characteristics: They stay dry, are super absorbent and permeable.

The unique sealed individual packaging of every pad protects them from exposure to moisture and microorganisms while in storage in your bathroom, purse, or travel bag.

Blüm pads are a new generation of sanitary pads with a new nanotechnology strip, which may improve your perspective.*



Blüm pads may support and normalize vaginal pH and stop the spread of microbial infections. The emission of Far-IR and negative ions Anion chip is 6190↑/cm³

Bacteria Growth and reproduction

Unlike multicellular organisms, increases in the size of bacteria (cell growth) and their reproduction by cell division are tightly linked in unicellular organisms. Bacteria grow to a fixed size and then reproduce through binary fission, a form of asexual reproduction. **Under optimal conditions, bacteria can grow and divide extremely rapidly, and bacterial populations can double as quickly as every 9.8 minutes.** In cell division, two identical clone daughter cells are produced. Some bacteria, while still reproducing asexually, form more complex reproductive structures that help disperse the newly formed daughter cells. **The majority of bacteria are anaerobes, meaning they survive in an environment with no oxygen.**

Bacterial vaginosis (BV) is the name of a condition in women where the normal balance of bacteria in the vagina is disrupted and replaced by an overgrowth of certain bacteria. It is sometimes accompanied by discharge, odor, pain, itching, or burning .

Main Components of the Product:

· **Chip with a new nanotechnology. :**The Far-IR rays and anion chip are embedded in the MSM layer of the sanitary pads. This is a distinctive technological feature of Blüm products, and when the product is used, high concentrations of negative ions (6190↑/cm3) can be launched. The antibacterial function, superior odor reduction and other positive effects can be attained by pure physics. The Far-IR rays system can improve an individual's metabolism and microcirculation, activate cells and strengthen the immune system. The Blüm Technology is designed for anti-inflammatory and antiseptic functions with no side effects.

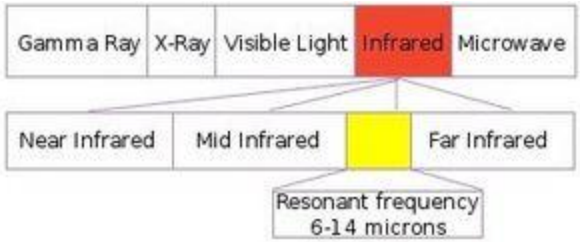
· **The soft organic cotton top layer** is made with a very thin, soft cottony material which maintains optimal comfort and dryness at all times. Specially designed side walls prevent side leakage.

· **The absorbent layer,** which contains absorbent environmentally safe polymer, can solidify liquid immediately when it is absorbed into the material. At the same time, it can prevent infiltration and leakage and can facilitate a higher degree of performance and comfort during exercise and activities.

· **The breathable bottom layer** is made of special materials to ensure the ultimate degree of moisture absorbance to maintain dryness.

· **Non-toxic adhesive tape** (the kind used in the food industry) is specially designed for air flow. The outer packaging is easy to open, and each individual pad is fully sealed to prevent possible contamination.

· **Manufacturing:** Blüm permeable sanitary pads are manufactured in strict compliance with National Health Standard GB15979-2002 in the People's Republic of China. To ensure that the automated production and packaging process is free from contamination, they are manufactured in a closed production advanced environment.



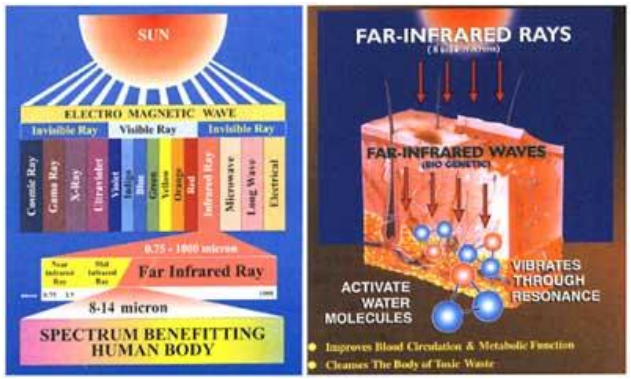
WHAT ARE FAR INFRARED RAYS (Far-IR)?

- **Far infrared** (**FIR**) is a region in the infrared spectrum of electromagnetic radiation. Far infrared is often defined as any radiation with a wavelength of 15 micrometers (μm) to 1 mm (corresponding to a range of about 20 THz to 300 GHz), which places far infrared radiation within the CIE IR-B and IR-C bands. Different sources use different boundaries for the far infrared spectrum; for example, astronomers sometimes define far infrared as wavelengths between 25 μm and 350 μm. Visible light includes radiation with wavelengths between 400 nm and 700 nm, meaning that far infrared photons have less energy than visible light photons.

Far Infrared rays (FIR) are just like the heat from our sun or that which our own bodies produce as they burn fuel to keep us warm. We live in an environment of FIR waves and our body receives and radiates them. Among the energy spectrum coming from the sun, the FIR waves are the safest and the most beneficial electromagnetic energy sources available; especially when the resonant frequency is from (λ =3-100 microns).. In fact, panels that produce similar infrared rays are used in hospitals to warm newborn babies. Even NASA has used infrared heat to keep their astronauts warm. So no need to worry. Infrared energy has nothing to do with either ultraviolet radiation (which gives you a sunburn and damages your skin) or atomic radiation (the kind from a nuclear bomb).

The human body contains more than 70% water (H2O) by weight and a lot of proteins. FIR waves cause resonance with water molecules. It ionizes and activates water molecules in our cells and blood thus improving our blood circulation. Based on these effects, FIR waves will be able to dilate capillary vessels, and ultimately increase blood circulation and active metabolism in tissues and cells. It also promotes elimination of waste matters and harmful heavy metals out of human body.

Far-IR SCIENCE



Far INFRARED (Far-IR) rays.

The far infrared ray is a type of energy ray. The far infrared rays have some medical benefits as well. The light touches deep down the cells, stimulating blood circulation as well as enhancing immune systems to the extent of keeping the body in good health. The far infrared ray has soothing effects on the pains and helps with perspiration and sleeping problems.

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Photonics Lasers Med. 2012 Nov 1;4:255-266.

Far infrared radiation (FIR): its biological effects and medical applications.

Vatansever F[1], Hamblin MR.

Author information

Abstract

Far infrared (FIR) radiation (λ = 3-100 μm) is a subdivision of the electromagnetic spectrum that has been investigated for biological effects. The goal of this review is to cover the use of a further sub-division (3- 12 μm) of this waveband, that has been observed in both *in vitro* and *in vivo* studies, to stimulate cells and tissue, and is considered a promising treatment modality for certain medical conditions. Technological advances have provided new techniques for delivering FIR radiation to the human body. Specialty lamps and saunas, delivering pure FIR radiation (eliminating completely the near and mid infrared bands), have became safe, effective, and widely used sources to generate therapeutic effects. Fibers impregnated with FIR emitting ceramic nanoparticles and woven into fabrics, are being used as garments and wraps to generate FIR radiation, and attain health benefits from its effects.

KEYWORDS: FIR emitting ceramics and fibers; biogenetic rays; blackbody radiation; far infrared radiation; infrared sauna; radiant heat

PMID: 23833705 [PubMed] PMCID: PMC3699878 **Free PMC Article**

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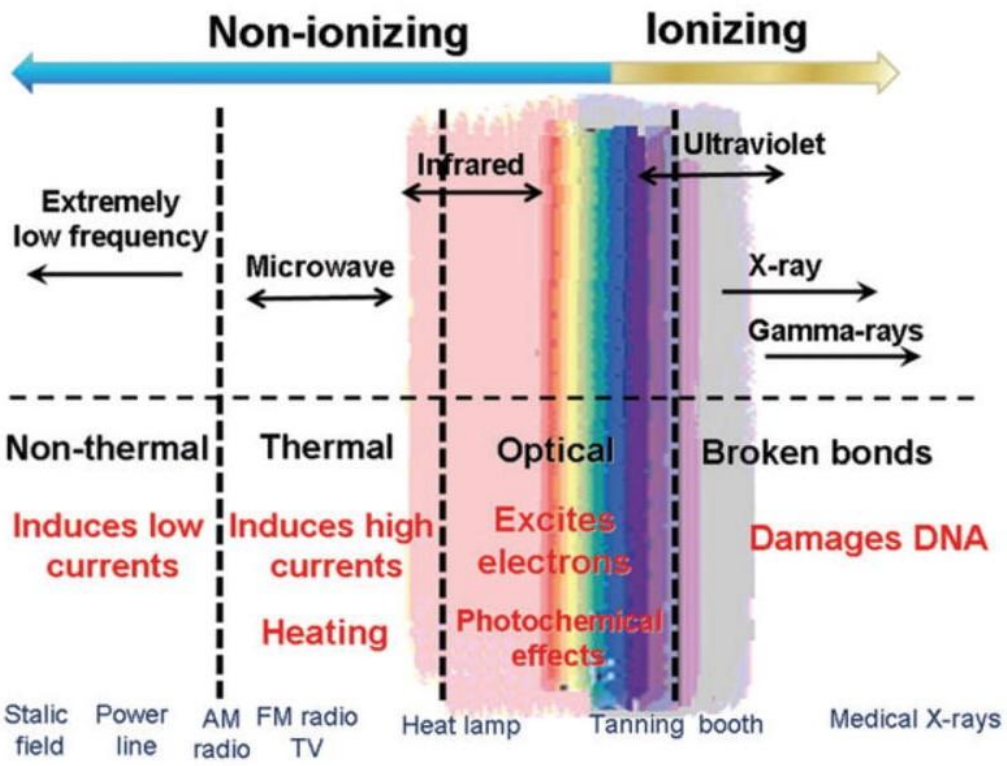

The spectrum of electromagnetic radiation and some biological changes it may induce.

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Abstract

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J Photochem Photobiol B. 2012 Jan 5;106:61-8. doi: 10.1016/j.jphotobiol.2011.10.006. Epub 2011 Oct 20.

Far infrared ray irradiation attenuates apoptosis and cell death of cultured keratinocytes stressed by dehydration.

Chen YC[1], Lai LC, Tu YP, Wu SD, Chen CF, Li B.

Author information

Abstract

Far infrared (FIR) irradiation has been widely applied in health promotion. The aims of this study were to investigate the protective effect of FIR irradiation on stressed keratinocytes and the signaling pathways involved. HaCaT was subjected to sorbitol dehydration with or without 40min pretreatment with FIR radiation 4h earlier. Western blots of cell lysates were analyzed for caspase-3, HO-1, BCL2, Bax, ERK, and Akt. The incidence of apoptosis was also assessed by TUNEL staining. Evaluation of cell viability was determined using MTT. mRNAs were extracted and compared using Illumina Human Ref-8 v2 BeadChips. Hyperosomotic injury of HaCaT cells caused by sorbitol resulted in increased cleaved caspase-3 expression and this effect was decreased by FIR pretreatment; these findings were confirmed by TUNEL staining and MTT tests. Pre-treatment with FIR irradiation before sorbitol-induced dehydration significantly upregulated phosphorylated Akt (p-Akt) levels and A6730, an Akt kinase inhibitor (5μM), attenuated the protective effect of FIR irradiation. A microarray study showed FIR irradiation had far less effect at the transcriptional level. FIR pretreatment attenuates apoptosis and cell death in dehydration-stressed cultured keratinocytes through the PI-3K/Akt pathway, this protective effect of FIR irradiation is not at the transcriptional level.

PMID: 22062776 [PubMed - indexed for MEDLINE]

MeSH Terms, Substances

LinkOut - more resources

Title:
Biological activities caused by far-infrared radiation**Authors:**
Inoué, Shojiro; Kabaya, Morihiro**Affiliation:**
AA(Institute for Medical and Dental Engineering, Tokyo Medical and Dental University), AB(Japan Research Laboratory of Sleep Science)**Publication:**
International Journal of Biometeorology, Volume 33, Issue 3, pp.145-150**Publication Date:**
09/1989**Origin:**
SPRINGER**Keywords:**
Far-infrared radiation, Growth, Health, Skin blood flow, Sleep**DOI:**
10.1007/BF01084598**Bibliographic Code:**
1989IJBm...33..145I

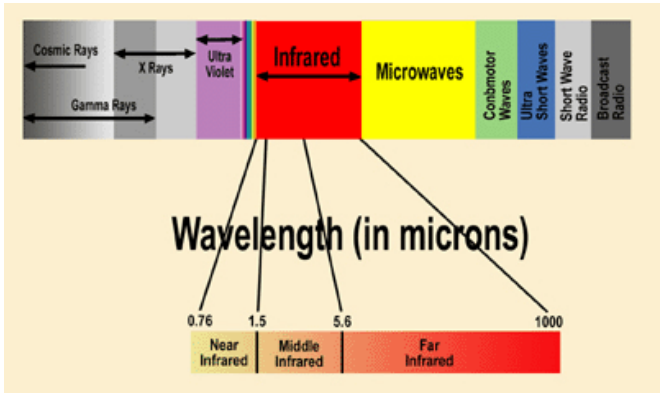
Abstract

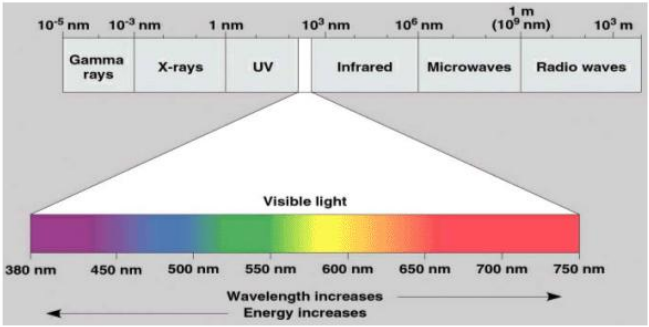
- Contrary to previous presumption, accumulated evidence indicates that far-infrared rays are biologically active. A small ceramic disk that emist far-infrared rays (4 16 µm) has commonly been applied to a local spot or a whole part of the body for exposure. Pioneering attempts to experimentally analyze an effect of acute and chronic radiation of far-infrared rays on living organisms have detected a growth-promoting effect in growing rats, a sleep-modulatory effect in freely behaving rats and an insomiac patient, and a blood circulation-enhancing effect in human skin. Question-paires to 542 users of far-infrared radiator disks embedded in bedelothes revealed that the majority of the users subjectively evaluated an improvement of their health. These effects on living organisms appear to be non-specifically triggered by an exposure to far-infrared rays, which eventually induce an increase in temperature of the body tissues or, more basically, an elevated motility of body fluids due to decrease in size of water clusters.

FAR INFRARED RAY

General Features: Far infrared ray is the longest wavelength, one among the light beams, whose spectrum (4-16 micron) is most benefiting to human body. These rays have their own characteristic feature to penetrate deep into our body. This beneficial ray vitalizing the biological function is known as the mystery with its action of heat balancing, ripening, intellectual, drying, neutralizing, and resonance. The rays not only benefit the skin and muscles but all cells including blood vessels, lymph & sweat glands and nerves in the deep part of the body. Especially, in contact with the molecule of water and protein inside of our body, it shakes the cells 2,000 times a minute. Accordingly, these unique typical actions enable our cells being activated to get the effect of prevention of all kinds of geriatric diseases by increasing the blood circulation, metabolism, anti-aging, relief of neuralgia, chronic fatigue, backache, arthritis pain with it's more practical further benefit, smooth blood circulation, toxins removal, calories burning, pain relief, higher immune system and free-fatigue.

More than 20 ceramic and various mineral oxides powders are mixed and preheated to 1600°C to get into fine powders like cosmetic materials being shaped into a variety of bio ceramic and negative ion products radiating 13M wave band altered rays as the originated one from mother nature.



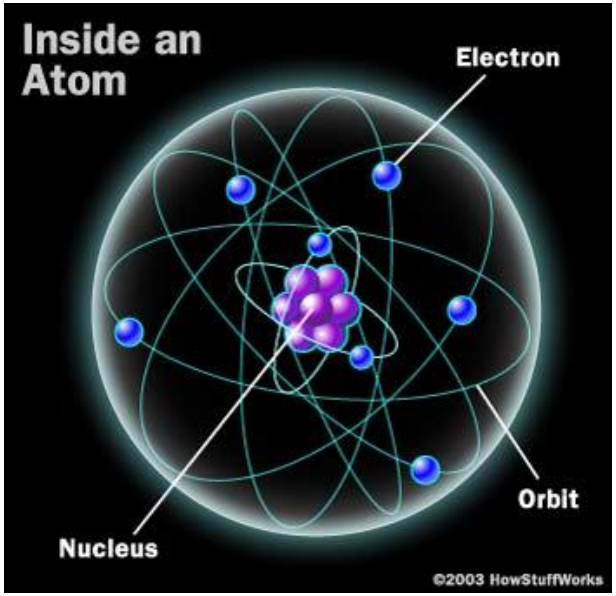


· **Far-IR activates water molecules in the body**
· **These active molecules increase blood circulation**
· **Increase metabolism efficiency**
· **Get rid of waste products more quickly and efficiently**
· **Decrease acidity in the blood**
· **Increase the blood's Oxygen contents**

Far-IR was first discovered through spectroscopes by German scientist in 1800. Since then, many researchers from Italy, United States of America and Germany have found that it helps to promote health profoundly. Since 1980's researchers and experts from United State of America, Japan, Korea and China have started to accumulate scientific proofs on the contributions of FIR waves to human health. FIR waves are popular in Japan and Korea and recently numerous research papers on clinical experimentation and application of FIR waves are published. In depth research by the Japanese expert has shown that FIR waves is similar to the average ”qi" (8 micron) wavelength emitted during ”qi gong" therapy which has been practiced by ancient Chinese since 3000 years ago.

Conclusion

Although we cannot see Far-IR, they are beneficial and necessary for all living things. America, Japan and some European countries realized this long ago. Some examples are Far-Infrared Saunas, Far-Infrared Treatment Lamps, Far-Infrared wraps, Far-Infrared clothing, Far-Infrared ovens, and a variety of Far-Infrared Treatments are ongoing in clinical studies.



WHAT ARE NEGATIVE IONS (ANIONS)?

Anions are created in nature with air molecules broken apart from sunlight, far infrared rays and moving air or water. Anions are odorless tasteless ions that are breathed into our respiratory system. High concentrations of anions can be found in nature in mountain forests, waterfalls, and beaches where people feel energized and invigorated, which helps relieve stress, alleviate depression, and boost energy.

Indian Journal of Psychiatry
Official Publication of the Indian Psychiatric Society

Indian J Psychiatry. 1992 Jul-Sep; 34(3): 253–259. PMCID: PMC2982078

EFFECT OF NEGATIVE ION ATMOSPHERIC LOADING ON COGNITIVE PERFORMANCE IN HUMAN VOLUNTEERS

A. Chitra Andrade,[1] Charlotte Fernandes,[1] Leila Verghese,[1] and Chittaranjan Andrade*[,2]

Author information ► Copyright and License information ►

Abstract

Negative ion atmospheric loading has been reported to affect a range of psychological functions, from alertness to circadian rhythms, and has been suggested to benefit a variety of medical conditions, from allergies to migraine. In a double-blind study planned to assess the effect of negative ions on cognitive performance in human volunteers, 65 female graduate course students were randomized into ionized atmosphere (n = 34) and control (n = 31) groups. The following cognitive tasks were administered: Digit Symbol Substitution Test, Addition Test, Visual Memory (Complex Figure) Test, Verbal Memeory (Complex Passage) Test, Ideational Fluency Test and Clerical Speed and Accuracy test. On all but the last two tests, the negative ion groupperfonned significantly better (to a 15-40% extent) than controls. It is concluded that negative ionization of the atmosphere by artificial means may be of benefit in certain common, practical situation in which depletion of these ions occurs.

How Negative and Positive Ions Affect our Bodies

Negative Ions	*Positive Ions*
Dilate blood vessels	Constrict blood vessels
Stabilize blood pressure	Increase blood pressure
Increase blood akalinity	Increase blood acidity
Strengthen bones	Weaken bones
Promote urination, increase nitrogen in urine	Suppress urination, decrease nitrogen in urine
Stabilize respiration, makes breathing easier	Accelerates respiration, makes breathing more difficult
Decrease pulse rate	Increase pulse rate
Enhance heart function	Impair heart function
Speed physical recovery	Prolong physical recovery
Calm and relax nerves	Tense and strain the nervous system

The relationship between anion quantity with human health.

Environment Anion Consistency (/cm³) Relation

* Forests & waterfalls Above 10000 Cure disease
* Alpines & Sea sides 2000-10000 Against disease
* Outskirts & fields 1000-2000 Increase immunity
* Parks of cities 500-1000 Keep healthy needs
* Greenbelts of cities 100-300 Easy to be sick
* Houses of cities 40-100 Cause some diseases
* Using Air conditioning 0-25 Disease can flourish

Table 1 - Main causes of metabolic acidosis according to serum anion gap

High anion gap	Normal anion gap
Diabetic ketoacidosis	Diarrhea
Uremia and acute renal failure	Renal tubular acidosis
Lactic acidosis (types A and B): inborn errors of metabolism, shock, hypoxia, ischemia, etc. Lactic acidosis-D	Ureterosigmoidostomy Villous adenoma
Toxins (exogenous anions): methanol, ethylenglycol, salicylates, paraldehyde, formaldehyde, penicillin, carbenicillin, etc.	HypoaldosteronismUse of aldosterone inhibitors
Massive rhabdomyolysis	Uremia (initial stage)
Fasting ketosis	Increase in cations: K^{+}, Ca^{++}, Mg^{++} Cation retention: IgG, lithium
Hyperalbuminemia (transitory)	Hypoalbuminemia (low anion gap)
Late metabolic acidosis of the neonate	Some cases of diabetic ketoacidosis receiving insulin therapy

Source: Adapted from Halperin & Goldstein[9] and Rose.[10]

SOURCES: Review of PubMed/MEDLINE, LILACS and Cochrane Library databases for articles published between 1996 and 2006 using the following keywords: metabolic acidosis, lactic acidosis, ketoacidosis, diabetic ketoacidosis, cardiopulmonary resuscitation, sodium bicarbonate, treatment. Classical publications concerning the topic were also reviewed. The most recent and representative were selected, with emphasis on consensus statements and guidelines.

The emission of Blüm Far-IR negative ions (Anion chip) is 6190↑/cm³

For over half a century, experts have studied the relationship between anions and health. And they have all agreed that in this day and age, our health is greatly influenced by the quantity and quality of ions, which saturate our environment. A.D. Moore (a professor at Michigan University), a world renown authority in the ongoing study of ions, wrote that the control of anion quantity in the air can induce good effects on the human body, and that the intake of anion-saturated air can be helpful in curing patients. Thus, it has become common knowledge among scientists today that the anion is an integral factor in health improvement and sustenance, and the best source for anions is Far-IR. Among the many ions that constantly float in the surrounding air, the very light anion is one of the most active. This activity of anions (bio-energy) is the core of better and healthier living.

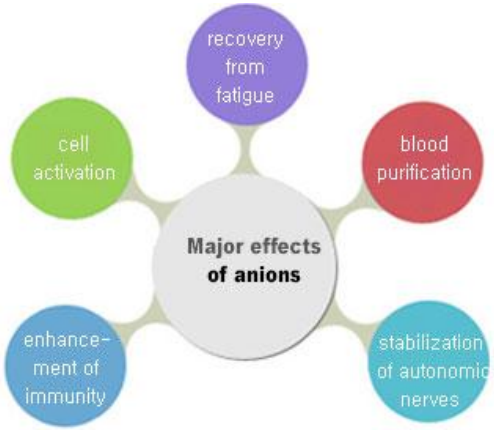
Negative (-) and Positive (+) ion levels Measured in various locations

Location	Negative Ions (-)	Positive Ions (+)
Offices	70	14,000
Industrial Areas	50	300
Shopping Malls	220	280
Residential Areas	200	180
Forests	2,500	800

Negative ions are beneficial to human body in four major ways:

1. Strengthen the functions of autonomic nerves
2. Reinforces collagen (tissues that are resilient and tension-related)
3. Improves the permeability of the cell's prototype plasma membranes (improves metabolism)
4. Strengthens the body's immune system

Metabolism, which is the process of acquiring nutrients from the blood and excreting waste out of the body, is extremely important to the human cells. The more anions there are in the blood, the more efficient the cell's metabolism process.



Blüm, Far-Infrared & Anion Sanitary Pads F.A.Q

Q1: Why are Blüm sanitary pads antibacterial?
A: The **new Nanotechnology** chip with far infrared radiation (in the frequency range of human body radiation) has the ability to generate a flow of anions with concentration of 6190↑/cm³ (The highest in this industry) negative ions in a cubic centimeter of air due to the **friction** and the heat emitted from the body. This promotes the killing of bacteria and eliminates the unpleasant odor. The far infrared rays strengthen and heal the skin and stimulate blood circulation.

Q2: Why are Blüm sanitary pads breathable?
A: The base layer has the ability to let air through but not liquids. The majority of bacteria are **anaerobes**, meaning they survive in an environment with **no oxygen**.

Q3: Why aren't Blüm sanitary pads scented?
A: Scent does not mean cleanliness and hygiene. Besides, it is well known that there are women prone to allergic reactions to scented sanitary pads. Post-menstrual women and pre post-menstrual women may experience increasing genital itching.

Q4: What are the advantages of the materials used for their production?
A: The fine cottony surface provides for a pleasant feel, freely permeates liquids and does not provoke allergic reactions. The absorbent material has the ability to absorb 4 times more than common female pads , thus providing better protection. The absorbent is wrapped in dust-free non-recycled paper (recycled paper from cartons, newspapers, magazines, etc. are not used as, despite the processing, they may contain substances that are harmful to the woman's health). The glue used is food-based and if it stays on the undergarments after their washing it is not harmful at all.

Q5: What additions to Blüm sanitary pads are available?
A: When you buy a pack of Day or Night Blüm sanitary pads from a pharmacy you also get a self-test card for pH which is attached to each pack. Blüm pads normalize vaginal pH and stop the spread of microbial infections. To control bacterial growth, the vagina is normally slightly acidic with a pH of 3.8–4.2. A swab of the discharge is put onto litmus paper to check its acidity. A pH greater than 4.5 is considered alkaline and is suggestive of bacterial vaginosis.

Q6: For how long do the sanitary pads generate anions?
A: The duration of anion generation by Blüm sanitary pads is 10-12 hours.

Q7: What are the advantages of the packaging?
A: Normally the sanitary pads are kept in the sanitation units – bathrooms and toilets. It is well known that warm and humid rooms are a favorable environment for proliferation of various bacteria. Blüm sanitary pads packaging is made of foil that is used in the food industry and is suitable for reuse, it can be opened and closed many times.

Q8: What are the advantages of packing every individual pad within the packaging?
A: Even if you leave the pack open, the individual pads are hermetically sealed which preserves their sterility. They can be kept in a handbag or another place without compromising their sterility.

Q9: What is the purpose of the self-test card accompanying each pack?
A: The purpose of the self-test card is to allow you to test your genital pH yourself in a convenient time and comfortable place and if necessary to see a specialist. To obtain correct results from your self-test please read the instructions for use on the back of the packaging.

Q10: Why sanitary pads play an important role in female's physical well-being?
A: According to studies conducted by the World Health Organization, the hygiene of female sanitary products is especially important to a woman, as the pelvis, uterus, vagina of a women's body are all inter-connected, thus it increases the chances of bacteria infection if sanitary pads of low hygiene standards were used during the menstruation period.

Q11: Why is it important to replace sanitary pads on a regular basis?
A: Menstruation flow and secretion are highly prone to bacteria growing, therefore sanitary pads should be replaced on a regular basis. Under normal circumstances, bacteria start to grow 15 minutes after a new pad is used. In two hours, the pad can be filled with bacteria. It is strongly advised that a new pad is replaced once every two hours during the menstruation period.

Q12: Why are medicated or scented sanitary pads not necessarily good for women?
A: Being scented does not mean a product is sterilized. Likewise, medicated pads can bring about allergies if a person is allergic to the medical ingredients. We therefore strongly advise against using scented or medicated sanitary pads.

Q13: In what ways do Blüm products differ from conventional choices at the market?

A: First of all, we are truly committed to manufacturing health products under stringent quality control standards and bringing women better health, better value and an unprecedented level of comfort. Blum pads are light, odorless, bacteria-killing and can be used assured of no side effects. Unlike many of the brands who have devoted their resources in doing commercials and hiring celebrities in their promotion, we devote all of resources in our product development, in pursuit of real quality and benefits for women.

Q14: What are the special characteristics of the packaging of Blum pads?

A: Most customers tend to store sanitary pads in the bathroom, which is rather unhygienic. Under the moist environment, pads will be prone to bacteria growth. For Blüm pads. We have adopted the highest standards in packaging which are comparable to those used for food packaging. This ensures that every piece of Blüm pads remains dry and more resistant to bacteria growth.

Q16: What are the benefits of far-infrared and anion technologies that are used in Blüm pads?

A: The effects of far-infrared and anion technologies are amazing. The effectiveness of far-infrared and its therapeutic properties have been studied worldwide for an extended period of time and is now beginning to become very popular in many countries. Far-infrared is very helpful for healing the skin, blood circulation, and skin cell revitalizing. While anion is proven to be effective in inactivating mold, viruses, allergens, and other harmful airborne substances in the air.

Q17: Does the Blüm brand of products offer the right value for money?

A: In choosing the right kind of sanitary pads, one can be surprised by the benefits it brings about because in a number of studies it is proven that 61% of diseases were caused by or related to use of sanitary pads. The birth of Blüm pads is to provide a product of superior quality, one that is comfortable for the customers to use, while offering an aspect of health-improving features such as the far-infrared and anion elements.

Blum pads are available in the network of pharmacies. They posses the following certificates:

- Quality certificate ISO 9001:2000 awarded by the International Standards Organization.

- EU – certificate of compliance № SZE0901001015 in accordance with directive 93/42/EEC of the Council of the European Communities.

- Certificate of national quality standard issued by the United Arabian Emirates in 2008

- Certificate for Control RIOKOZ (RIPC PH- Regional Inspectorate for Protection and Control of Public Health).

You will feel confident and secure with **Blüm!**

SOUTH-CHINA TESTING CENTER (Shanghai)

STC

Tel:+86-21-55213553, 55211172 . Fax:+86-21-65891647

Service contains: Auto parts reliability tests, Environmental tests, Auto materials tests

Test Report

Test Item	Concentration of anion Testing
Report No	55643-1
Sample Name	Multi function non-woven fabric
Sample Receive Date	May . 7, 2013
Test Performing Date	May. 17, 2013
Applicant	DG Investments Inc

TEST METHOD

SFJJ-QWX25-2006

RESULTS:

Concentration of anion	6190 个/cm^3

*** End of report ***

Reported by:.....

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TEST REPORT

{BLÜM}  {BLÜM}

SOUTH-CHINA TESTING CENTER (Shanghai)

Tel:+86-21-55213553, 55211172 . Fax:+86-21-65891647

Service contains: Auto parts reliability tests, Environmental tests, Auto materials tests

Test Report

Test Item	Antimicrobial Testing
Report No	55643
Sample Name	Multi function non-woven fabric
Sample Receive Date	May . 7, 2013
Test Performing Date	May. 17, 2013
Applicant	DG Investments Inc

TEST METHOD

GB/T 20944.3-2008 Textiles - Evaluation for antibacterial activity - Part3: Shake flask method

TEST BACTERIA

Staphylococcus aureus, ATCC No. 6538 Gram-positive organism

RESULTS:

Test Specimen [1]	Organism	CFU/ml at"0" HR contact time	CFU/ml at 24HR contact time	Reduction rate[2] (%)
Test Specimen		/	1.0×10^2	> 99%
Control Specimen[3]	6538	1.1×10^4	6.4×10^6	/
Reproductive value		2.8		

1. Test Specimen were incubated at 25℃ for 18 hours under dynamic contact conditions
2. The active value in percentage was calculated as follows
   Reduction rate =100×(C-A)/C% Reproductive value=logC-logB
   Where A=the number of bacteria recovered from the samples after 18 hours contact.
   B= the number of bacteria recovered from the control at "0" time contact.
   C=the number of bacteria recovered from the control at 24hs contact.
3. Compared with the untreated cloth sample

CONCLUSION

The sample has the antibacterial effect

*** End of report ***

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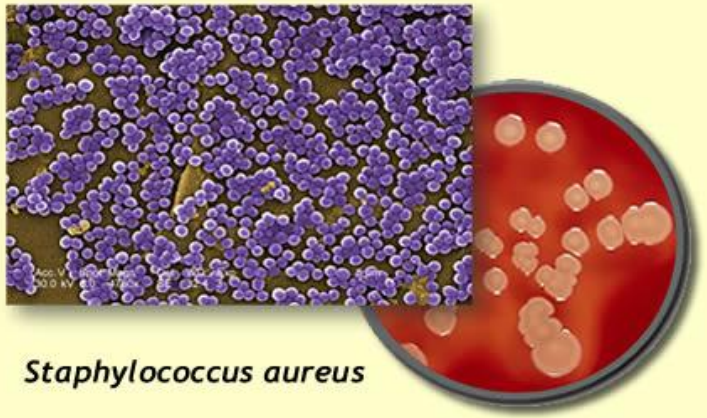
TEST REPORT



The **Food and Drug Administration** (**FDA** or **USFDA**) is an agency of the United States Department of Health and Human Services, one of the United States federal executive departments, responsible for protecting and promoting public health through the regulation and supervision of food safety, tobacco products, dietary supplements, prescription and over-the-counter pharmaceutical drugs (medications), vaccines, biopharmaceuticals, blood transfusions, medical devices, electromagnetic radiation emitting devices (ERED), veterinary products, and cosmetics.

Author: Dra. Monica Lopez & Dr. Astorga Ex-Minister of Health Department in Mexico.
DG Investments Inc. & Blum, Inc.

BACKGROUND

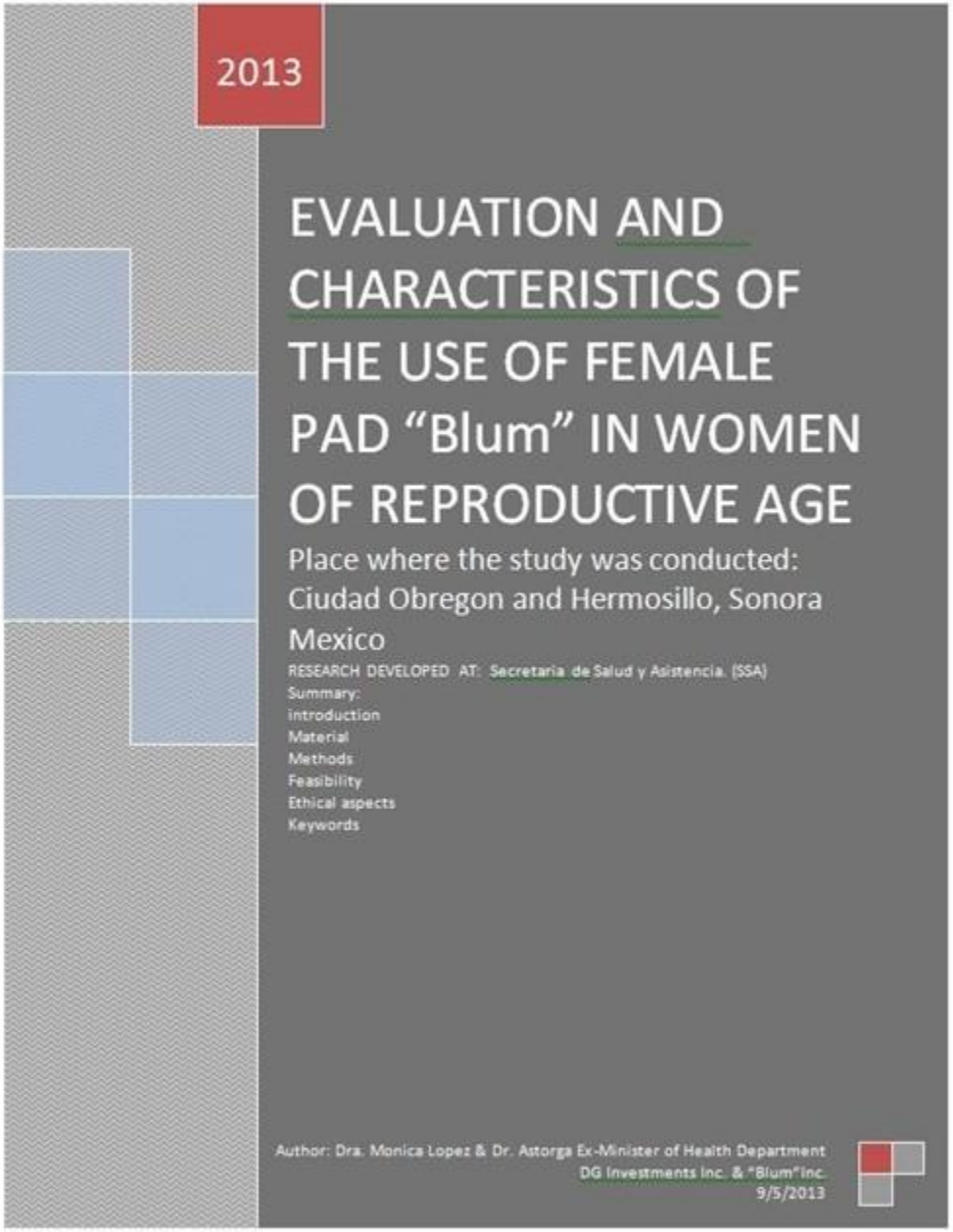
In Mexico we have a female population according to the Census of Population and Housing 2013. 117 millions 409 Thousand 830 , of these about 28 million are at reproductive age in the general population.

The menarche or first menstruation usually occurs between 11 to 14 years old, with an average of 12 years 6 months, the stability of menstrual cycles is reached after six years (18-20 years) at the start of the menstrual cycle. The menstruation has a range of duration of 3-7 days with an average of 5.2 days, the average blood loss per day varies from 35 to 43 ml.

The disposable pads are commonly used in the female population of childbearing age during the phase secretion of the menstrual cycle, in order to stem the blood flow. The female pads has evolved over the years perfected in the sense of offering the wearer comfort and absorption, which is why there have been many options in the market, using various materials. Although the purpose of the sanitary pad is to encourage and support the phase secretion, but has also become a source of contamination and cause infection and local dermatitis wearers.

The World Health Organization estimates that 87% of used pads after two hours have more than 107 bacteria's by square centimeter, producing bacterial infection, if we add the temperature, humidity and menstrual bleeding also favors the growth of microorganisms producing infection.

Vaginal infections: 80% of women suffer at least once in their life and 63% of the infections are caused by repetitive and continuous use of bad quality pads as a primary source of contamination. It is also important to consider the pH of chemicals in these products.



General Direction for Education and Quality Research Department Registration Form

Studies have shown that the tourmaline and other infrared producing elements significantly increase the intracellular concentration of calcium ions , phagocytosis , and the generation of reactive oxygen species on neutrophils , and lymphocytes blastogenetic response to mitogens . Despite the increase in reactive oxygen species generated by neutrophils , lipid peroxidation from unsaturated fatty acid is inhibited. The results suggest that the materials which emit electromagnetic radiation in the far infrared range , have the ability to potentiate leukocyte function without promoting oxidative damage , favoring the presence of permanent defenses in the application site .

Due to the heat produced by the tourmaline and which causes local vasodilatation decreased dysmenorrhea ,

Besides the afore mentioned effect , it has also been demonstrated antibacterial and antifungal activity , either as a promoter and / or agonist of the activity in combination with already tested products , even without a mechanism of action tested , microorganisms which have demonstrated activity are in pseudomonas , staphylococcus aureus , actinobacter sp , involved in this activity primarily negative ions .

Currently in the Tourmaline pads presented favorable results in preventing vaginal infections producing local changes in pH , no improvement being measured so far , however the product is already registered by the FDA (Food and Drug Administration) as demonstrating that it meets the quality requirements necessary for use.

SALUD

DIRECCIÓN GENERAL DE ENSEÑANZA Y CALIDAD
DEPARTAMENTO DE INVESTIGACIÓN
Formato de Registro

1. Institución: DG INVESTMENTS, INC
2. Unidad Administrativa:
3. Protocolos de Investigación:
   a) Título: **Evaluación de las Características de uso de la Toalla Femenina BLUM en las Mujeres de Edad Reproductiva**
   b) Autor Principal(es): **M.C. Mónica López Morales**
   c) Colaborador(es): **Lic. María Elena Romero Arredondo**
4. Tesis:
   d) Título:
   e) Autor Principal(es):
   f) Tutor(es):
5. Avalado por el Comité de:
   Nota: con fundamento en el Artículo 23 del Reglamento de la Ley de Salud General en Materia de Investigación, se dispensa al investigador la obtención del consentimiento informado.

Investigación:	( )
Ética en Investigación:	( )
Bioseguridad:	( )

6. Línea de Investigación:

Biomédica:	( )
Clínica:	( )
Salud Pública:	( )
Educación:	( )

7. Registro:	Folio	Año	Mes
	192	**2013**	**09**

Director General de Enseñanza y Calidad
Dr. Ariel Vázquez Gálvez

Director de Enseñanza Capacitación e Investigación
Dr. Ricardo Franco Hernández

Bibliography

↑ Dr. Jose Zavala, Editor of literature: *"Female Sanitary Pads with Tourmaline".* Los Angeles, CA 2015.

Annotated bibliographies and listed with the description of other sources: PubMed, National Institutes of Health and United States National Library of Medicine. Building protocols or arguments that are useful for science. Creating these annotations, in order to enrich the content of the article cited, extending its information. In accordance with this descriptive and interpretive criteria and other scientific sources.

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