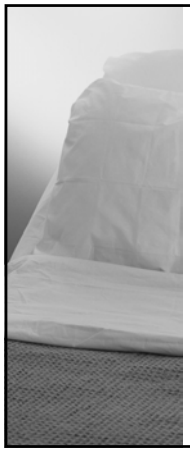
Disinfecting Soft Goods

Dr. Curt White

A Webber Training Teleclass



Disinfecting Soft Goods - Microbial Problems on Fabrics and Foams Used in Healthcare Settings … Proactive and Reactive Strategies

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Disinfecting Soft Goods - Microbial Problems on Fabrics and Foams Used in Healthcare Settings – Proactive and Reactive Strategies.

1. Introduction
2. Microbes – Life and Habits/Types
3. The Consequences of Microbial Growth
4. Microbes are everywhere
5. Microbial Habitats
   - Soft Goods
   - Building Materials
   - Rooms
   - Services
   - People
   - Wounds

Disinfecting Soft Goods - Microbial Problems on Fabrics and Foams Used in Healthcare Settings – Proactive and Reactive Strategies.

6. Microbial Control
   - Infection Control Variables
   - Infection Control Realities
   - Dose Reduction Strategies
   - Antimicrobial Agents
7. Proactive Strategies
8. Reactive Strategies
9. Conclusions
10. Summary

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Introduction

Enter the world of "wee beasties"

The World Around Us – Healthcare Environments

The Good, The Bad, and the Ugly

This is personal and affects caregivers and Patients

Fight or Flight?

Disinfecting Soft Goods

NOT A SIMPLE LAUNDRY LECTURE

NOT A SIMPLE DISINFECTION LECTURE

NOT A SIMPLE MICROBIOLOGY LECTURE

NOT A SIMPLE SOFT GOODS LECTURE

THIS IS: ALL OF THE ABOVE

MICROBES

Bacteria
- Gram (+)
- Gram (-)

Fungi
- Mycelial
- Yeast

Algae

MICROBES Life Needs

MOISTURE

NUTRIENTS

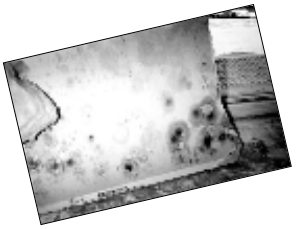
PROPER TEMPERATURE

RECEPTIVE SURFACES

If humans are comfortable, so are a wide range of microbes.

The Consequence of Microbial Growth

BUILDING INFECTION:

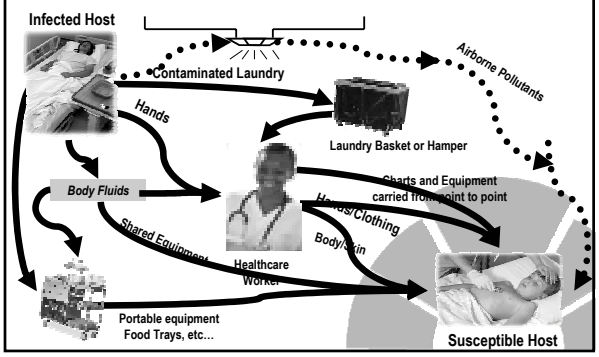


ODORS
STAINS
DETERIORATION
BIOFILMS

FINANCIAL LOSS
FUNCTIONAL TIME LOST
LIFE OF MATERIALS LOST

The Consequence of Microbial Growth

HUMAN INFECTION:



The Consequence of Microbial Growth

HUMAN INFECTION:

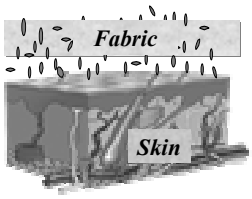
ADDED COSTS

BED USE EXTENDED

INFECTION CONTROL PROBLEMS

EXPOSURE RISKS TO STAFF, VISITORS, AND OTHER PATIENTS

Microbes are Everywhere



Amplification
(Source of Growth)

Transfer (Vector)

Work Space

Work Products

Microbial Habitats

Soft Goods are EVERYWHERE in the healthcare environment

Woven Fabric
Nonwoven Fabric
Foams
- Open Celled
- Closed Celled

Microbial Habitats

Roofing Felts

Insulations:
Walls
Roof
Pipes
Ducts
HVAC

BUILDING MATERIALS AND FURNISHINGS

Wall partitions
Upholstery
Foam Cushions
Carpets
Mats
Toys (pediatrics)

Microbial Habitats

ROOMS

Wall Coverings
Mats
Bedding
Blankets
Towels
Bed Pads
Linens

Microbial Habitats

SERVICES

Lapidus Pads
Masks
Mayo Stand Covers
Tuck Towels
Incise Drapes
Surgical Drapes
CSR Wraps

CLEANING:

Wipes
Rags
Mops

CAFETERIA

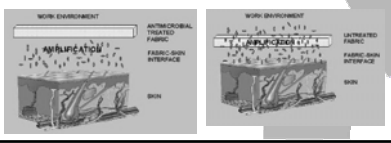
Linens
Wipes
Rags
Uniforms

Microbial Habitats

PEOPLE

Gloves
Shirts
Scrubs
Underwear
Socks
Smocks

Uniforms
Hats
Shoes
Pants
Incontinence Diapers
Baby Diapers



Microbial Habitats

WOUNDS

Stockinettes
Wraps
Garments
Gauze
Band-Aids

Microbial Control

DOSE

VIRULENCE

SUSCEPTIBILITY

DOSE REDUCTION WITH BEST AVAILABLE TECHNOLOGIES

Microbial Control: Infection Control Realities

ALL OF THE HANDWASHING PROTOCOLS

ALL OF THE DISINFECTING PROTOCOLS

ALL OF THE STERILIZING

ALL OF THE SPECIALIZED TRAINING

ALL OF THE SPECIAILIZED FILTERS

AND....

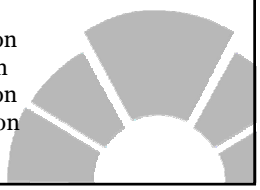
STILL THERE ARE RISING HOSPITAL ACQUIRED DISEASE STATISTICS!

Microbial Control: Dose Reduction Strategies

Preventative Treatment
After Contamination
During Use

Antimicrobial or Antibiotics

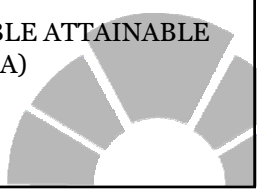
Sterilization
Sanitation
Disinfection
Preservation



Microbial Control: Dose Reduction Strategies

People seeking zero defect (infection), design to minimize human error by controlling what is controllable – hence, controlling dose of microbes from all sources seeking:

AS LOW AS REASONABLE ATTAINABLE (ALARA)



Cleaning Practices

Microbial Habitats –
Out-of-Sight and Out-of-Mind?

Laundry Practices

Housekeeping Practices

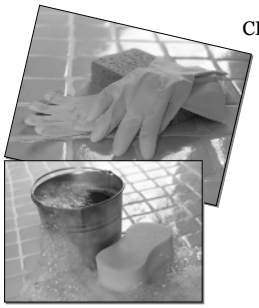
In-Service Practices

Cleaning Practices

ALTER THE PRODUCTS AND NOT THEIR FUNCTION

- Product Design (use and abuse)
- Covers
- Soil Release/Builders
- Stain Repellent/Stain Release
- Safe Antimicrobial Treatments

Cleaning Practices



CLEAN UP THE DIRT

- Physical wiping
- Surfactants
- Oxidizing Agents
- Bicarb or CO_2 (“Blasting”)

Cleaning Practices

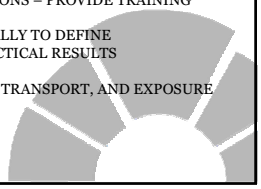
KILL THE MICROBES/KEEP THEM KILLED

- Oxidizing Agents
- Sterilants
- Autoclaving
- Safe Antimicrobial Treatment

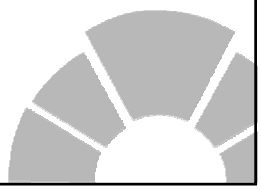
FOLLOW AND POST CARE INSTRUCTIONS – PROVIDE TRAINING

WORK CROSS FUNCTIONALLY TO DEFINE
BEST PRODUCTS AND PRACTICAL RESULTS

REDUCING DOSE=REDUCING SOURCES, TRANSPORT, AND EXPOSURE



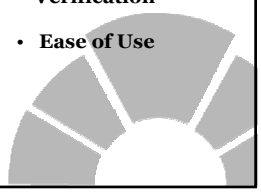
Microbial Control: Antimicrobial Agents



Antimicrobial Agents

Differ in Their:

- **Chemical Nature**
- **Durability**
- **Safety**
- **Mode of Operation**
- **Regulatory Compliance**
- **Effectiveness**
- **Cost**
- **Verification**
- **Ease of Use**



Antimicrobial Types

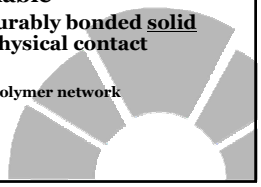
Leachable

Leach out of substrate to inhibit growth

Non-Leachable

A unique technology is a durably bonded solid that inhibits growth by physical contact

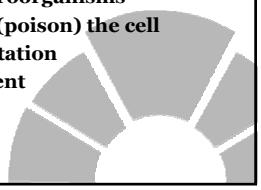
The solid is a micropolymer network



Conventional Antimicrobials

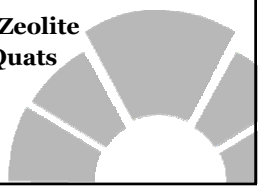
Diffuse from the product to come in contact with the microbe

- **Leach or migrate off the product**
- **Are consumed by microorganisms**
- **Chemically interrupt (poison) the cell**
- **Cause microbial adaptation**
- **No means of attachment**

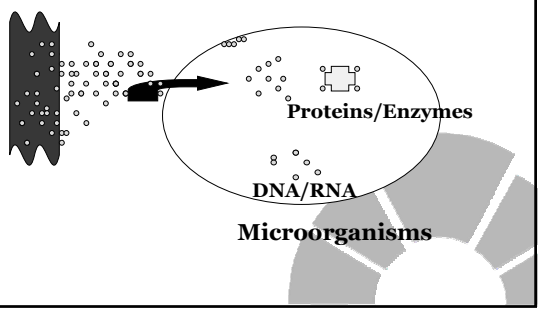


Conventional Antimicrobials - Examples

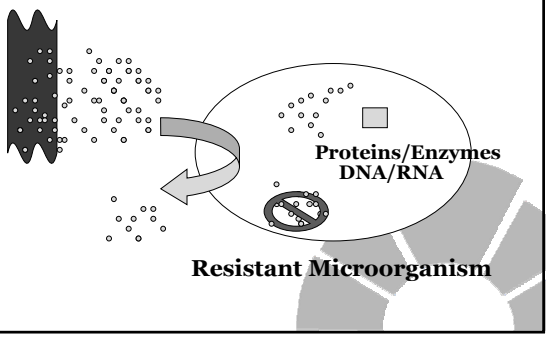
- **Bis chlorinated phenols**
- **Organo tins (i.e. TBT)**
- **Organo metallics (Pb, As, Hg)**
- **Chitin**
- **Silver Copper/ Zeolite**
- **Water soluble Quats**
- **Biguanide**
- **Isothiozolione**



Mode of Action: Traditional Antimicrobials



Mechanisms of Resistance: Traditional Antimicrobials

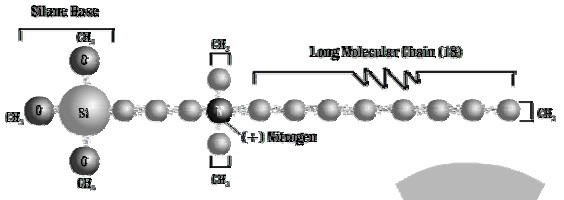


Bonded Technology

Bound to the product controlling microbes on contact

- **Bonded to the product surface**
- **Not consumed by microbes**
- **Mechanically stabs the cell**
- **Extended functional life**
- **Will not cause an environment to promote microbial adaptation**

Silane Technology

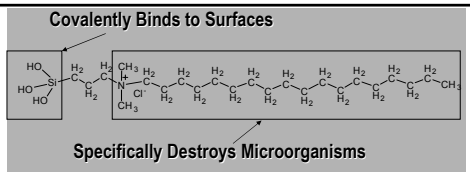


3-(trimethoxysilyl) propyldimethyloctadecyl ammonium chloride

EPA Registration Number 34292-1

C.A.S. Number 27668-52-6

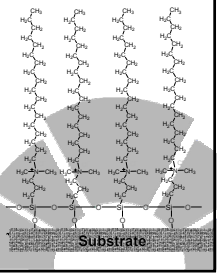
Empirical Formula C26 H58 Cl N O3 Si



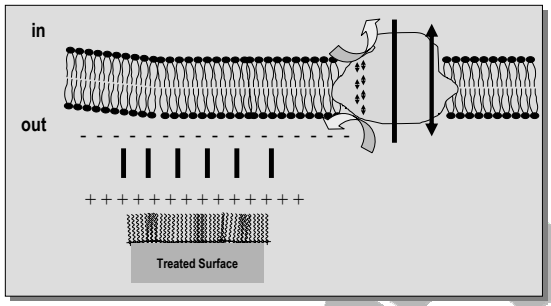
Antimicrobial is covalently bound to substrate…

Functionality stays intact and active through washing and repeated exposure to microbes

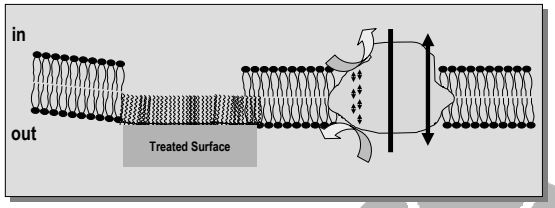
Extends functional life of goods by resisting deterioration



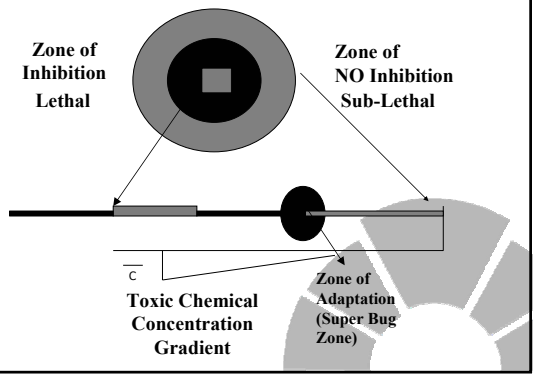
Ionic Association with Biological Membrane Surface



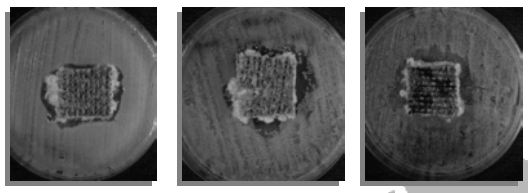
Physical (Integral) Association with Biological Membrane Surface



Zone of Inhibition Story

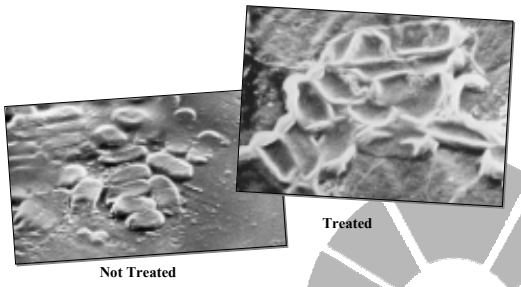


Microbial Adaptation

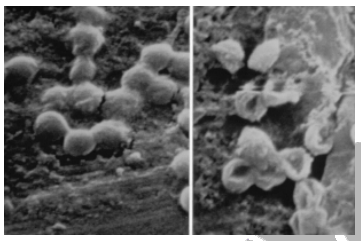


Initial Zone | Adapting Cells in the Zone | Fully Adapted Cells with Ghost Zone

Photographs taken by electronic microscope



Photographs taken by electronic microscope



Microbial Control: Proactive Strategies

Control Microbial Growth Conditions

MOISTURE
TEMPERATURE
NUTRIENTS
RECEPTIVE SURFACES
TREAT WITH A DURABLE LONG-LASTING ANTIMICROBIAL

Microbial Control – Reactive Strategies

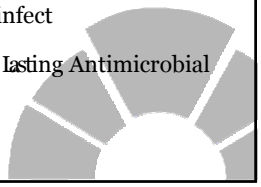
Throw out (burn or landfill)

Dry Out

Clean (Laundry, w/wo Sanitizers

Sanitize/Disinfect

Treat with a Durable Long Lasting Antimicrobial



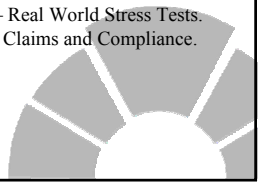
Conclusion

You MUST know:

- **Your Enemy** – The Problem Microbes.
- **The Antimicrobial** – "Womb to Tomb" Properties.
- **The Desired Substrate** – Compatibility and Durability.
- **The Manufacturing Process** – Safety, Compatibility, and Quality Assurance.
- **The Use and Abuse Conditions** – Real World Stress Tests.
- **The Regulatory Requirements** – Claims and Compliance.

AND…….

DO NO HARM



The Next Few Teleclasses

September 20 *(South Pacific Teleclass)*
SARS in Singapore – What Can We Learn
... with Dr. Chris Wynne, New Zealand

October 5 ***Neonatal Sepsis, A 2006 Update***
… with Dr. Anne Matlow, Hospital for Sick Children

October 12 ***The Changing Role of Infection Prevention and Control as Documented by the CBIC Practice Analysis***
… with members of the CBIC Board

Infection Control Week

October 19 ***Hand Hygiene – Improving Compliance***
… with Dr. John Boyce, Hospital of St. Raphael

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