



# AAHID Education Session November 12, 2018

## A16 Vinyl, Polyurethane, or Silicone? What you need to know to specify Durable Coated Fabrics for Healthcare

# AAHD CHID Certification





## The American Academy of Healthcare Interior Designers is a nonprofit organization committed to the development and administration of the <u>only certification program</u> for healthcare interior designers.

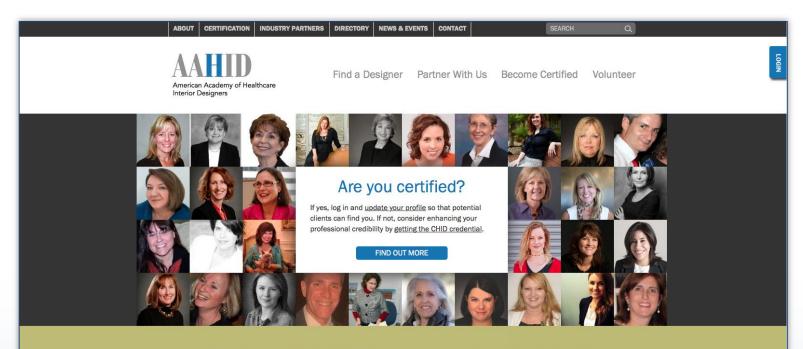




#### CHID Certified Healthcare Interior Designers® are the most qualified to ensure the health, safety, and welfare of patients, residents, and staff in hospitals, clinics, and residential care facilities.



## **Connect with AAHID**



#### Recognizing excellence, commitment, and knowledge

Whether you're a healthcare interior designer looking to boost your professional credibility and help advance the field; or someone looking for a highly qualified healthcare interior designer to join your team, you've come to the right place. AAHID's Certified Healthcare Interior Designer (CHID) credential recognizes excellence, commitment, and knowledge of this complex discipline.

# aahid.org

# AAHID

# Distinguish Yourself.







• Learn about durable coated fabric construction, performance characteristics, to inform your upholstery specifications.





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- Discuss findings from current durable coated fabrics durability test, including expectations vs. realistic lifespan of upholstered items, and the effect of premature failures on your current business model.



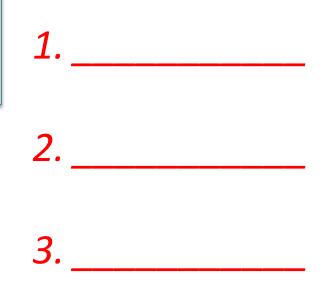


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- Discuss findings from current durable coated fabrics durability test, including expectations vs. realistic lifespan of upholstered items, and the effect of premature failures on your current business model.
- Realize the benefit of a multi-disciplinary group of industry partners coming together with shared purpose to creatively and collaboratively solve common problems.



# When selecting an upholstery material (fabric) for a public/patient healthcare environment...

#### What are your top three issues?





**#HCDcon** innovation + insight + inspiration



Shari Solomon, Industrial Hygienist & President, CleanHealth Environmental, LLC.



Janan Rabiah, Executive Director, Association for Contract Textiles, ACT



Ronnie Bell, Technical Manager, OMNOVA Solutions; Current Chair of Chemical Fabrics & Film Association, CFFA



Barbara Dellinger, Director Design & Research, Adventist Healthcare





#### ... Jargon Alert!



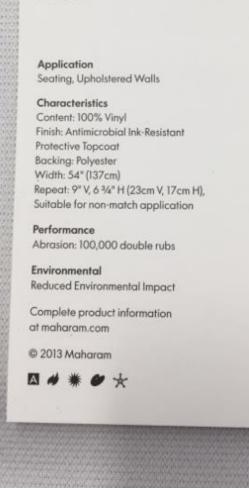


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#### QUIZ TIME!



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A. Sample Ticket

B. Memo Tag

C. Hang Tag



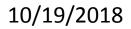


What are the particular challenges and issues we will be addressing with this educational session?





#### Have you ever seen a room like this?







#### What is the elephant in the room?





#### What is the elephant in the room?

## Cleaning and disinfecting agents requiring dwell time, with final rinse, which is not necessarily occurring.





# Manufacturer testing, standards, and warranties based on cleaning/disinfecting paradigms ...*that aren't happening!*





The result is premature upholstery fails, disgusted patients & visitors, and staff who are managing furniture instead of patients! (3 years)



#### **Durable Coated Fabrics Task Group**

In February 2017, a group of designers, manufacturers, distributors, and other industry partners were at a healthcare design conference when the subject of real world experiences of failure of durable coated fabrics came up.

We all felt the pain, so decided to get together and see if we can find an answer!



#### **Durable Coated Fabrics Task Group**

Our group is comprised of manufacturers, distributors, healthcare designers, trade association and environmental services representatives. Through conference calls and meetings we discuss issues of durability, including polling the industry for information on current practices, upholstery specification checklists, durability testing, and industry advancements. Our findings are posted on the AAHID LinkedIn page to help continue the dialog.







Ronnie Bell, Technical Manager, OMNOVA Solutions; Current Chair of Chemical Fabrics & Film Association, CFFA What are the major types of durable coated fabrics and how are their specifications different from one another?







# COATED FABRICS

101

# How to make the **right** choice for your healthcare upholstery



#### What are durable coated fabrics?

#### **Coated Fabrics**

represent a family of fully coated textiles that can be considered "nonporous".

#### **Coated Fabrics**

Are NOT a textile with a coating applied to the yarn.

#### Choices are:

PVC – Polyvinyl chloride (vinyl)

PU – Polyurethane (PU)

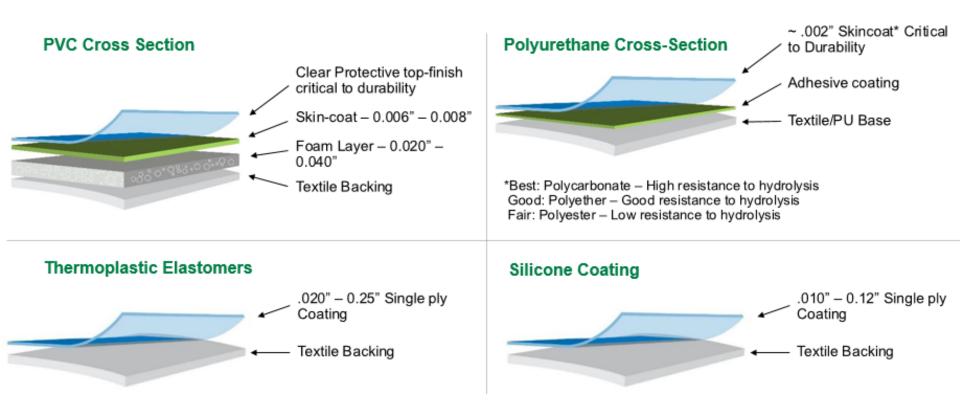
Silicone – relatively new to the Coated Fabrics market

Thermoplastic Elastomers – very new, used in roofing products for years



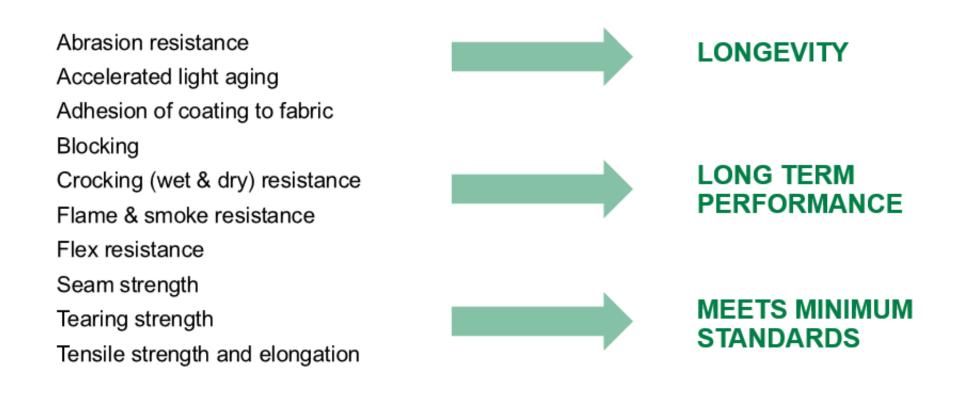


#### **Construction Basics**





#### **Coated Fabrics Specifications = Durability**





#### Coated Fabrics Specifications *≠* Chem Resistance

- Abrasion resistance
- Accelerated light aging
- Adhesion of coating to fabric
- Blocking
- Crocking (wet & dry) resistance
- CFFA-9 flame & smoke resistance
- Flex resistance
- Seam strength
- Tearing strength
- Tensile strength and elongation







#### **Chemical Resistance**





#### **Chemical Disinfectants**

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#### **Marketing Confusion?**



#### "Designed for Healthcare"

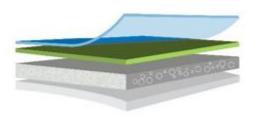




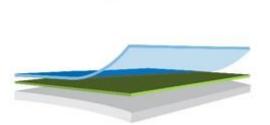


#### How do I select the best product?

#### PVC



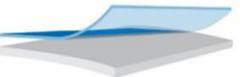
- Proven in field
- Chemical Resistance
- Long Life Cycle
- Wear resistance top finish
- · Minimally textured
- Water resistant



Polyurethane

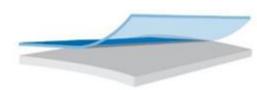
- Aesthetically pleasing
- Many are subject to hydrolysis
- Polycarbonates are the best for Chemical Resistance

#### Thermoplastic Elastomer



- Chemical Resistant
- Relatively new
- High Cost

#### Silicone Coating with ID of each ply



- Highly chemical resistant
- High cost
- Long term performance unknown
- Water repellant



#### **Chemical Resistance Testing & Certification**





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Test protocols are available

CFFA-100 – Accelerated Exposure to Disinfectants Ask for Technical bulletin listing specific disinfectants Request a letter of certification

Products are available today that are both durable and chemical resistant from the CFFA members below















Shari L. Solomon, Esq.

**Industrial Hygienist** 

President CleanHealth Environmental, LLC How is upholstery cleaning currently being done? Industry standards vs Real World applications. CleanHealth Environmental= Risk Management Training Solutions

## The Real World Challenges of Healthcare Cleaning & Disinfection

Presented by: Shari Solomon, Esq 301-377-9555

solomon@cleanhealthenv.com



### CleanHealth Environmental Risk Management Training Solutions

www.cleanhealthenv.com

Clean Health Environmental Risk Management Training Solutions

# The Most Recent Statistics

(Published March 2014)

- HAIs in U.S Acute Care
- Hospitals in 2011

10/19/2018

- 722,000 HAIs; 75,000 deaths during their hospitalizations.
- 1 in 25 hospital patients on any given day has at least one HAI.
- More than half of all HAIs occurred outside of the intensive care unit.

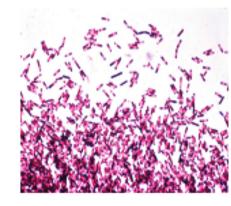
- U.S. Centers for Disease Control and Prevention (CDC)



eanHealth Environmenta Risk Management Training Solutions

# Surface Contamination

 Over the past decade, substantial scientific evidence has accumulated indicating that contamination of environmental surfaces plays an important role in the transmission of several key healthcare-associated pathogens, including MRSA,VRE, Clostridium difficile, Acinetobacter, and norovirus



Understanding and Preventing Transmission of Healthcare-Associated Pathogens Due to the Contaminated Hospital Environment - David J. Weber, MD, MPH (May 2013)





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НАІ Туре	Cost in Dollars
MRSA Infection	\$35,000-\$60,000
C.diff Infection (CDI)	\$18,000-\$90,000
Surgical Site Infection (SSI) (Knee or Hip)	\$30,000-\$50,000
Central Line Associated Blood Stream Infection (CLABSI)	\$16,000-\$20,000
Catheter associated Urinary Tract Infection (CAUTI)	\$5,000-\$10,000
Ventilator associated pneumonia (VAP)	\$15,000-\$25,000
Infect Control Hosp Epidemiol 2010; 31:365-373 <u>J Hosp Infect.</u> 2010 Apr;74(4):309-18 Merollini et al. BMC Health Services Research 2013, 13:91	<u>http://www.cdc.gov/mmwr/preview/m</u> <u>mwrhtml/mm6008a4.htm</u> http://www.cdc.gov/hai/pdfs/hai/scott _costpaper.pdf

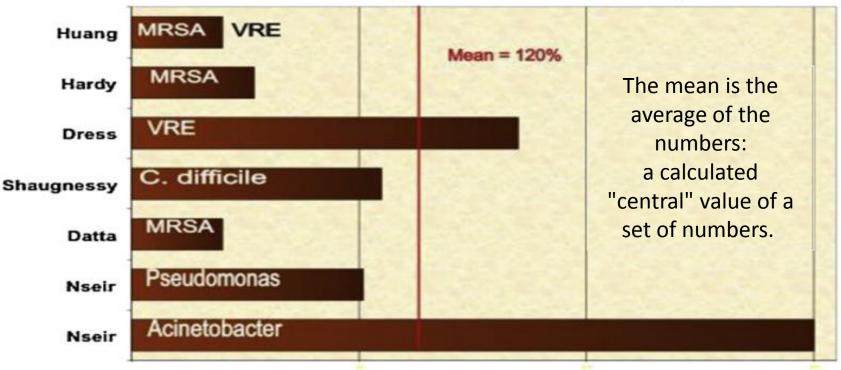
# Organisms Outside Human Body

Microbe	Survival time outside human body				
Clostridium difficile (spores)	5 months				
Acinetobacter spp.	3 days to 5 months				
Enterococcus spp. including VRE	5 days – 4 months				
Pseudomonas aeruginosa	6 hours – 16 months				
Klebsiella spp.	2 hours to > 30 months				
Staphylococcus aureus, inc. MRSA	7 days – 7 months				
Norovirus (and feline calicivirus)	8 hours to > 2 weeks <sup>1</sup>				
SARS Coronavirus	72 hours to >28 days <sup>2</sup>				
Influenza	Hours to several days <sup>3</sup>				
Adapted from Kramer et al. BMC Infect Dis 2006;6:130.	<ol> <li>Doultree et al. J Hosp Infect 1999;41:51-57.</li> <li>Rabenau et al. Med Microbial Immunol 2005;194:1-6.</li> <li>Bean et al. J Infect Dis 1982;146:47-51.</li> </ol>				



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# Increased HAI Acquisition Risk from Prior Room Occupant



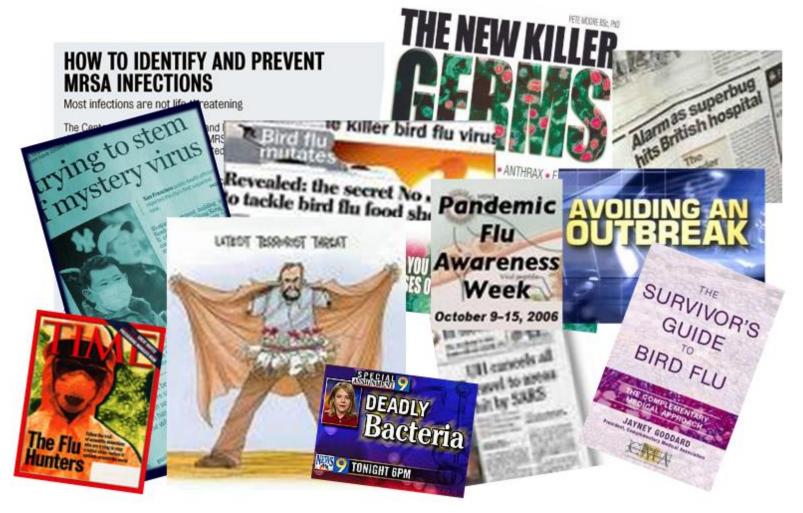
#### Increased Risk of Aquisition (%)

Carling P. Methods for assessing the adequacy of practice and improving room disinfection. AJIC. 2013.



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# Germ Awareness is On The Rise



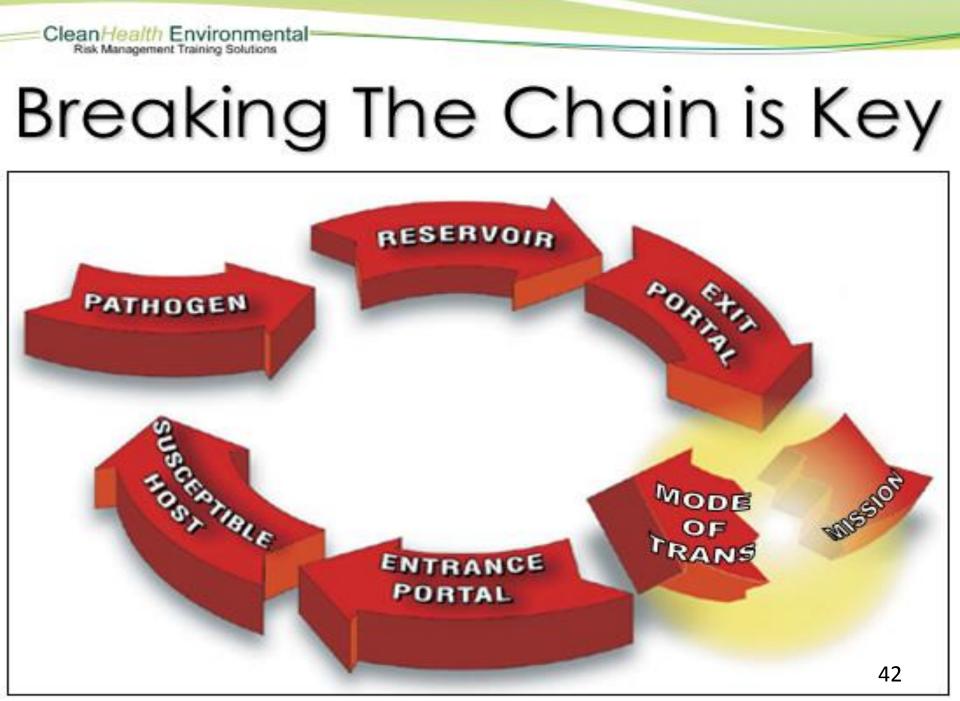
Clean Health Environmental Risk Management Training Solutions

# Specific Pathogens of Concern











## **Cleaning vs. disinfecting**

## Cleaning

- The removal of material like dust, soil, blood, and bodily fluid.
- Physically removes rather than kills microorganisms. Accomplished with water, detergents, and mechanical action.
- Always essential prior to disinfection or sterilization.
- A surface that has not been cleaned effectively cannot be properly disinfected or sterilized.

## Disinfecting

- The inactivation of pathogens.
- Usually involves chemicals, heat, or ultraviolet light.
- Sterilization destroys microbial life including bacteria, viruses, spores, and fungi and is not performed by environmental services.
- The most common disinfectants used are quaternary ammonium compound products, hydrogen peroxide-based products, and sodium hypochlorite (bleach).

#### Certified Healthcare Environmental Services Technician

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## **Resistance of pathogens to disinfectants**

Hard-to-Kill	J	
	Prions	Mad Dise
	Bacterial Spores	Clostr diffi
	Mycobacteria	Tubero
	Nonlipid or small viruses	Noro
	Fungi	Athlete
	Vegetative bacteria	MRSA
Easy-to-Kill	Lipid or medium viruses	Н

Pathogens	Example	Disinfectants					
Prions	Mad Cow Disease	Low-level Disinfection	level	ermediate- level sinfection		High-level Disinfection	
Bacterial Spores	Clostridium difficile			Ble	ach	Peracetic acid / hydrogen peroxide blends	
Mycobacteria	Tuberculosis		Quat / alcohol	Hydr	nd ogen		
Nonlipid or small	Norovirus			peroxide		Dielius	
viruses	viruses		Quat /				
Fungi	Athletes foot		alcohol blends				
		Quats					
Vegetative bacteria	MRSA, VRE						
Lipid or medium viruses	HIV						

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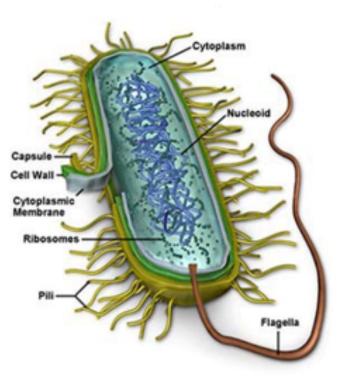
# How Disinfectants Work

### Surface Disinfectants

- Break down outer and inner cell walls
- Disrupt the physical properties of the cell
- Literally fry the inner cell components and do so much damage that the cell dies

### To Work Properly, Disinfectants Need

- Concentration/proper. dilution
- Contact time
- pH (high-alkaline or low-acid)
- Temperature (in fact extreme high temperatures alone can kill bacteria)





## What are dwell times?



## Dwell Time

The amount of time that a disinfectant must remain wet on a surface to kill microorganisms.

## Why does dwell time matter?

Knowing the dwell time impacts how much disinfectant to use and how long to leave it wet on the surface!





# In the Real World

### Timeframes for Cleaning

- > Occupied Rooms
  - AHE Best Practice 15-20 minutes
  - o Real World 10-12 minutes
- Discharge Cleaning
  - AHE Best Practice 45-60 minutes
  - o Real World 30-40 minutes



AHE – Association for the Healthcare Environment





# In the Real World

- The CDC recommends using, "a one-step process and an Environmental Protection Agency (EPA)registered hospital disinfectant designed for housekeeping purposes in patient care areas where:
  - 1) uncertainty exists about the nature of the soil on the surfaces (e.g., blood or body fluid contamination versus routine dust or dirt);

0ľ

 uncertainty exists about the presence of multidrug resistant organisms on such surfaces."



CENTERS FOR DISEASE" CONTROL AND PREVENTION





# In the Real World

- The primary method of combating HAIs in healthcare facilities is cleaning regimens using very strong chemical cleaners and disinfectants.
- These cleaners are designed to be used strictly on hard surfaces, but end up being used on almost all surfaces, including furniture upholstery.
- The result is that over time, repeated cleanings cause even the best urethane products to breakdown, usually by delamination of the surface layer.







How a cleaning product is actually used is dependent on the cleaning protocols set up by the individual healthcare facility. Some of problems that exist with how these chemicals are used in healthcare facilities include:

- 1. The cleaning solution used is much more concentrated than stated in the directions.
- 2. The cleaning solution is allowed to remain on the surface for longer than the prescribed time.



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3. The cleaning solution is not rinsed off with water.

It is still unclear what the long-term effect may be if the active ingredient of a disinfectant builds up on the fabric.

# High Touch Surface Areas

 Surfaces with regular hand-contact are called high touch surfaces.

CleanHealth Environmental

 These surfaces must be cleaned and disinfected daily to protect the patient and reduce the spread of HAIs



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# Trends and Technologies Use of Materials - Considerations

- Furniture and fabrics
- Privacy curtains and window treatments
- Soft Surface "Disinfectants"



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# New Surface Disinfection Technologies

UV disinfection

Hydrogen peroxide vapor





# **Cleaning Validation Tools**

ATP Cleaning Verification System

Clean Health Environmental Risk Management Training Solutions

Fluorescent Marking Gel







"The patient in the next bed is highly infectious. Thank God for these curtains."





# Contact Information

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www.cleanhealthenv.com

## CleanHealth Environmental Risk Management Training Solutions







Janan Rabiah

Executive Director, Association for Contract Textiles (ACT) What is the role of ACT; History of current testing guidelines and what informs the next iterations?







### association for contract textiles



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#### Principal Members

#### Associate Members

Anzea Arc-Com Architex Avant Garde Fabrics Baumann Dekor USA Bernhardt Textiles Brentano Burch Camira Fabrics Carnegie CF Stinson Charles Samelson Chilewich Concertex D.L. Couch Design Within Reach Designtex Donghia Eykon Design Resources

Fabric Innovations Geiger Textiles Guilford of Maine Harmel Home HBF Textiles J. Ennis Fabrics KB Contract KnollTextiles Kravet Contract Lebatex Leslie Jee Textiles Luna Textiles LUUM Maharam Mayer Fabrics Momentum Group P/Kaufmann Contract Pallas Textiles Pindler Pollack/Weitzner

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Buzzispace Groupe Lacasse Haworth Herman Miller HNI Irwin Seating Keilhauer Medline Industries Mitchell Gold Room & Board Steelcase Stylex Seating





## **ACT Certification Marks**

### Flammability



Durability









Sustainability





## History

#### ACT Survey 2010

Lifespan and appearance retention heavily impacted by cleaning. Now harsher cleaners and disinfectants being used.

#### **BIFMA 2014**

Cleaning and disinfecting pushes the performance requirements into a different realm. Products are being damaged by chemicals.

#### Interact 2014

Beauty Vs. Functionality: The Healthcare Challenge

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#### Interact 2017

The Healthcare Challenge: Cleaning & Disinfecting Soft Surfaces





## What We Know

- Hard surface cleaners
- Wiping preserves fabrics
- Rinsing takes time = \$
- Not rinsing = failures = \$
- Chemistry Incompatibility
- Failures can be catastrophic





## What We Are Doing

- ACT Cleaning Subcommittee
- Vinyl Institute Task Group
- Educational Tool for Specifiers





## **Fabric Selection Guide**

#### **Acute Care Patient Room Upholstered Seating**

#### 1. Fundamental Considerations

When selecting fabrics for this application it is essential to understand the unique demands that the fabric will encounter during its usage and life span. Assessing durability and appearance retention requires consideration of multiple factors *beyond abrasion resistance*.

- Review the facility's past experience and issues related to upholstered furniture applications.
- D Ensure that the fabric meets the minimum requirements for all ACT Voluntary Performance Guidelines.





#### Acute Care Patient Room Upholstered Seating

#### 2. Cleaning and Disinfecting

The most rigorous demand will be frequent cleaning and disinfecting protocols used by the facility's environmental services team to comply with Center for Disease Control and Prevention (CDC) requirements. Coated fabrics such as vinyl, polyurethane and silicone that are smooth and non-permeable can be suitable options; however, facilities may use different cleaning and disinfecting chemistries and application protocols. To help make the best selection for your project, ACT recommends the following:

Review the facility's cleaning and disinfection protocols and compare them with the recommended cleaning instructions provided by the fabric supplier. Determine if the fabric supplier has a Product Technical Bulletin available showing approved cleaners and disinfectants.

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- Identify the cleaning and disinfecting products that the facility will use and check with the fabric supplier to ensure the fabric can withstand and is compatible with those chemicals when applied according to the manufacturer's instructions for use. Cleaners and disinfectants intended for use on hard surfaces are generally not suitable for use on soft surfaces such as vinyl, polyurethane and silicone upholstery fabrics.
- Field testing of the material being considered with the facilities standard cleaning and disinfection protocols is recommended.
- Identify the most likely types of stains that will occur and determine if and how they can be cleaned without damaging the upholstery material. Review Care and Maintenance guidelines from your fabric supplier with the environmental services staff to compare facility-based practices with upholstery manufacturer recommendations.
- Remember that denim dye transfer can present a particularly challenging problem. Determine if the coated fabric has sufficient dye transfer resistance or is dye transfer cleanable. If not, choose a dark color that will help mask the dye transfer.

Real life experience has shown that fabrics which are exposed to incompatible chemistries and/or not rinsed properly after applying cleaners/disinfectants may become damaged to the extent that the furniture may need to be removed from service. Cleaning and disinfecting chemistries may also impact a fabric's appearance retention, which may result in lower scores from patients related to a facility's cleanliness and aesthetics impacting reimbursement and downtime costs to the facility.





#### Acute Care Patient Room Upholstered Seating

#### 3. Furniture Design/Manufacturing

Vinyl, polyurethane and silicone have varying physical characteristics that should be addressed with the furniture manufacturer to ensure the most appropriate upholstering processes for the specific material to minimize the potential for appearance and performance issues in actual field application. To help make the best selection for your project, ACT recommends that you do the following:

Review the furniture quality, style, design features and upholstery details while considering potential wear and appearance retention issues.

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- Confirm that the textile has been approved for use as a COM. Note: COM approval, testing and any special handling may require extra time in the manufacturing process.
- Carefully review furniture and textile warranties.





#### Acute Care Patient Room Upholstered Seating

#### 4. Material Ingredients/Chemicals Transparency

When selecting fabrics, you may need to factor in the individual facility's priorities addressing sustainability, environmental issues, and the possible risk of exposure to certain chemicals. A decision to voluntarily comply with material ingredient criteria in certification programs such as LEED, WELL Building Standard, Healthier Hospitals Initiative, Practice Greenhealth, Healthcare without Harm, Green Globes and Living Building Challenge may limit fabric choices and require compromise regarding fabric performance issues particularly resistance to cleaners and disinfectants.

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- Determine if the individual facility is seeking a certification.
- Determine if meeting a material ingredient list or other protocol is required and ask your supplier to document their product accordingly.
- If the fabric selected based on meeting material ingredient criteria in a certification program, determine if the fabric will meet field performance requirements and expectations.





#### **Fabric Selection Guide**

Acute Care Patient Room Upholstered Seating

#### 5. Whom to Contact for Additional Information

Textile Supplier (Upholstery supplier)

- Information on textile end-use
- Information on textile test results

Furniture Manufacturer

- Textile's suitability for application on specific product
- Customer's Own Material (COM) approval
- ACT www.contracttextiles.org
  - ACT Voluntary Performance Guidelines
  - Descriptions for test methods
  - Technical white papers
  - FAQs
  - Glossaries
- BIFMA www.bifma.org
  - BIFMA HCF8.1, Health Care Furniture Design Guidelines for Cleanability
  - ANSI/BIFMA e3 Furniture Sustainability Standard/LEVEL® Certification Program
- CFFA -www.cffaperformanceproducts.org
  - Technical Publications





Market innovation is always ongoing, always evolving.

Market innovation is good and great things are probably being developed behind closed doors, even as we speak.

Demands of the market place drive improvements and product direction.







Barbara Dellinger, MA, FIIDA, CHID, CID, EDAC, NCIDQ

Director Design & Research, Adventist Healthcare How do these factors inform research designed to help improve real world performance of durable coated fabrics?

Realize the benefits of a multidisciplinary team of industry partners to solve common problems. Use research results.





## As Healthcare Interior designers we:

• Are often the link between disciplines

C-suite EVS Facilities Nursing /clinicians A/E and ID Sales reps End users Patients Patient's families Life safety Infection control Security

- Develop goals/objectives for interior design; balancing reality with design desires BUT
  - Objectives of various groups are different AND
  - Designers and sales reps want to try new products/designs AND
  - Money is usually an issue



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## Conflicting Objectives of Multi-disciplinary Teams

Not in order of priority, and every Healthcare system is different

Interior Designers Nursing staff	EVS	Patients	DCF Manufacturers & Distributors	Facilities
Comfort Aesthetics Safety Cleanability Fair Price Durability Longevity Warranty Sustainability Research and Documentation	Cleanability	Comfort Safety Aesthetics	Desirable product Profit Repeat Business Safety Aesthetics Comfort Sustainability Cleanability Research	Durability Longevity Cleanability Warranty Safety



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### Many hospital systems have the same problems: We are not alone!!

Adventist HealthCare

Johns Hopkins

Life Bridge

Inova Health Systems

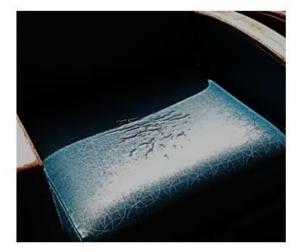
Medstar

New York Presbyterian

LSU

UMMS

**Cleveland Clinic** 













## Uncover the problems and find the answers

- ID's participate in monthly DCF conference calls: Volunteer to help do research, develop questionnaires, do field tests, share information
- Review/share credible research;
- Gather data: cost of failures, warranty issues and wording, understanding jargon and testing procedures
- Talk to interdisciplinary teams to get answers:
  - Stretch our comfort level of knowledge
  - Speak up when things are mysterious, or "unknowable"
  - Ask WHY???
  - Consult the experts: Researchers, scientists, clinicians, safety and infection control staff, industrial hygienists, and other designers.

### SHARE OFTEN. LEARN NEW INFORMATION. PASS IT ON.





## AHC – Shady Grove Medical Center Evergreen Lounge Field Test

- ICU/ CVIR Lounge 12 years old, all furniture is upholstered in fabric.
- Many "accidents" have occurred
- Some families stay for days, eat all meals, sleep on furniture.







## AHC Coated-fabric Field Test

- Using Evidence-based design steps
- Spec Furniture providing labor for new cushions triples, doubles and singles
- DCF Manufacturers/Distributors providing testing products: Vinyls PU's PUs 100% Polycarbonate Silicones TPE's Vinyl with PU topcoat
- AHC cleaning daily with Ecolab 456 standard cleaning process.





## AAHID will post info on their website and LinkedIn page as it becomes available.

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## Encourage all Interior designers to discuss this with your peers, clients, etc.

### We don't have all the answers yet, but we do have partners to help find the solutions!





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## What are our Next Steps?

## Results of "Three Concerns" ?





### Contact Information

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Shari Solomon: Solomon@cleanhealthenv.com

Teri Lura Bennett: tbennet2@jhmi.edu





- Session Evaluation HCD Mobile App
- All session evaluations will be done through the new HCD Mobile App.
- If you have not done so already please download the app through your device's app store. If you have any questions or need assistance please visit the help desk.

- Individual Session Evaluation Instructions –
- On the home screen, click Show Schedule
- Find the session you are attending
- After selecting an individual session, a navigation bar will appear on the left. Click the clipboard icon and evaluation/survey will begin.





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(www.facebook.com/HealthcareDesignMag) and tell us something you've learned or a unique product you've seen at this year's Healthcare Design Expo & Conference.





Shank you! - Questions?