

# NSF MUSES PROJECT

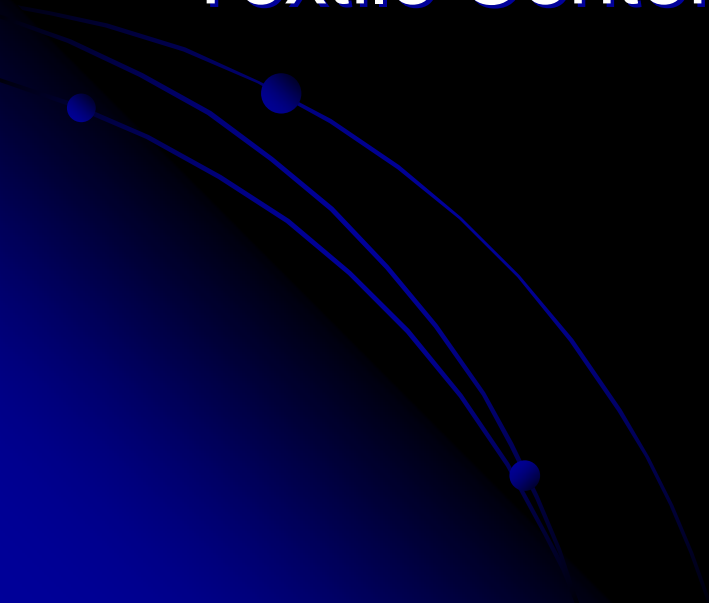
## Materials Use: Science, Engineering, and Society

Health Protective Textiles:  
Bridging the  
Disposable/Reusable Divide

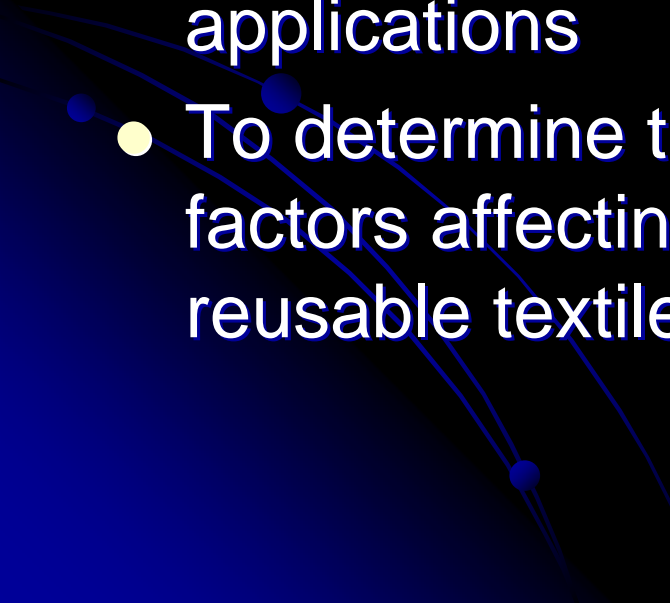


# Project Partners

ARTA, INDA, American Association of Textile Chemists and Colorists, American Society for Testing and Materials, American Hospital Association, National Textile Center, NIOSH, USEPA, etc.

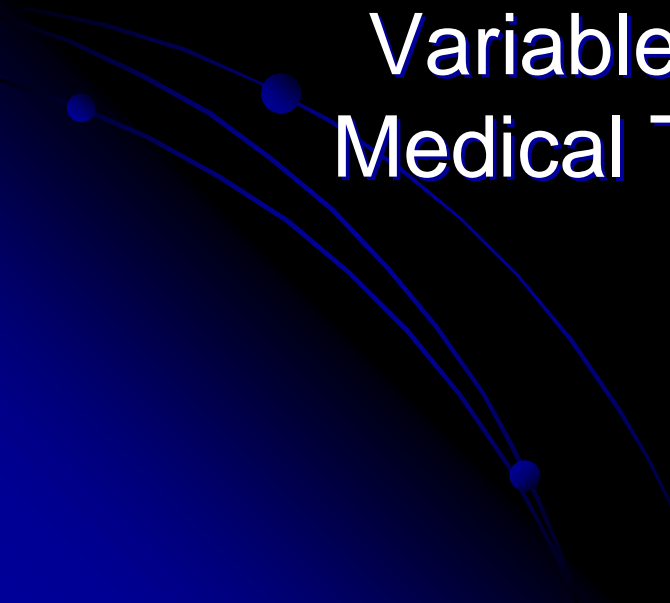


# General Research Objectives

- To determine the most effective materials for different medical applications
  - To quantitatively assess the economic, environmental, and health risks associated with use of various materials for different medical applications
  - To determine the social and psychological factors affecting acceptance of disposable and reusable textile products in healthcare settings
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# Past and Ongoing Projects: Rucker's Laboratory

Variables Affecting Selection of  
Medical Textiles: Voices from the  
Hospitals



# Data Collection and Analysis

- Mail questionnaires and interviews with infection control professionals, hospital purchasing agents, doctors, nurses, etc.
- Observations



# Attitudes toward Medical Textiles: Purchasing Agents and Doctors

Yifan Lu and Margaret Rucker  
University of California, Davis



# Preliminary Study

- Questionnaires were mailed to a nationwide sample of 200 purchasing agents and doctors – 4 from each state. The return rate was close to 50%
- One goal of the preliminary study was to select a small number of important medical textile properties from a large number of potentially important properties
- Another goal was to determine extent of switching from one type of product to another and reasons for switching

# Frequency of Use of Reusable and Disposable Products

- 72% used all disposable surgical gowns, 4% used all reusable gowns
- 71% used all disposable drapes, 4% used all reusable drapes
- 81% used all reusable scrubs, 13% used all disposable scrubs
- 88% used all reusable bed linens, 5% used all disposable bed linen



# Switching Behavior

- For surgical gowns, 8% switched to more disposables and 5% switched to more reusables
- The reason given for switching to disposable gowns was cost.
- Cost was also mentioned as a reason for switching to reusables along with concern about strikethrough problems with disposables

# How Are Purchasing Decisions Made?

- 25% made by a committee
- 22% made by unit supervisors
- 21% made by unit supervisors with user input
- 32% other responses



# Main Study Sample

- A sample of 800 purchasing agents and 800 surgeons were randomly selected from the American Hospital Association Directory
- A total of 195 questionnaires were returned from purchasing agents and 174 from surgeons

# Demographic Profiles of Hospital Purchasing Agents (n=195) and Health Care Workers (n=174).

<b>Size of Hospital</b>	Hospital purchasing agents sample	Health care workers sample	<b>Location of Hospital</b>	Hospital purchasing agents sample	Health care workers sample
Small hospitals (beds<=50)	33%	43.1%	Midwest	26.4%	33.3%
Medium hospitals (50<bed<=250)	39.3%	33.5%	North	20.2%	19.9%
Large hospitals (bed>250)	27.7%	23.4%	West	29.0%	26.3%
			South	24.4%	20.5%

# Importance of Price in Previous Research

Previous research has found price to  
be a dominant factor in sales of  
surgical apparel



# Cross Tabulation of Levels of Willingness to Pay for a New Biocidal Medical Textile by Profession of Respondent

	Hospital purchasing agents	Health care workers
Don't want to pay more	58.5%	36.1%
Willing to pay 0%-5% more	2.3%	4.8%
Willing to pay 5% more	23.4%	28.6%
Willing to pay 10% more	7.6%	22.4%
Willing to pay 10%-15% more	1.2%	0.7%
Willing to pay 15% more	7.0%	7.5%

# Mean Importance Rankings of Selected Properties of Medical Textiles from the Main Study

Rank	Purchasing agent	Mean	Health care workers	Mean
1	Quality	6.00	Barrier protection	6.60
2	Compliance with regulations	5.63	Comfort	5.88
3	Comfort	5.61	Quality	4.97
4	Price	5.03	Compliance with regulations	4.51
5	Barrier protection	4.77	Price	4.31
6	Antimicrobial properties	3.26	Antimicrobial properties	3.72

# Analysis of Variance for Effect of Hospital Size on Willingness to Pay for Biocidal Medical Textiles (medium sized hospitals were willing to pay more)

Source	Mean Square	df	F	P
Between Groups	6.48E-03	2	3.175	.043
Error				



# Satisfaction with Current Medical Textiles

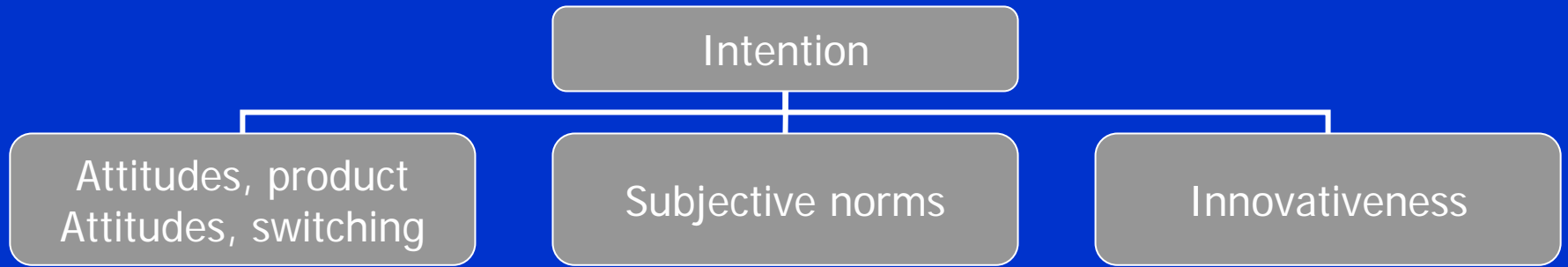
Level of Satisfaction	Purchasing Agents	Doctors
Satisfied	80.0%	73.6%
Neutral	15.4%	20.1%
Dissatisfied	4.1%	6.3%

# Some Sources of Dissatisfaction

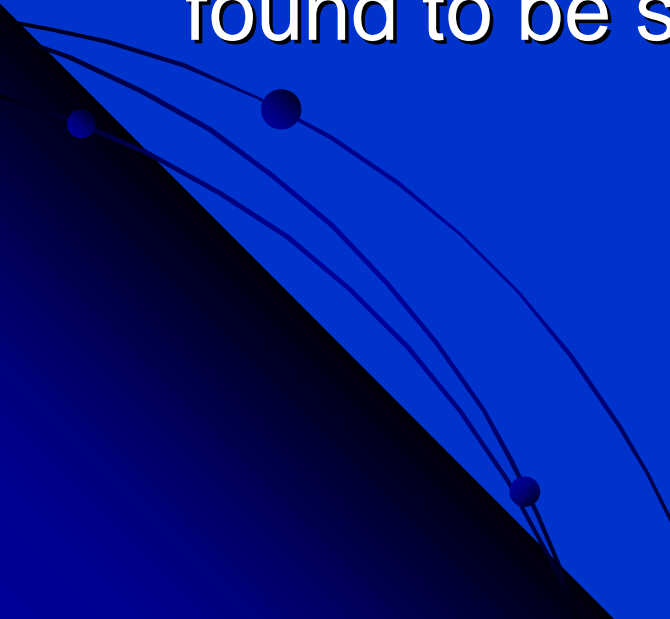
- Quality, cost too high for the quality
- Staining, off white (yellow) color
- Durability, some items are torn, products start to fray after one washing
- Sizing
- Delivery problems



# Factors Related to Intention to Purchase a New Medical Textile Product



# Predictors of Intention to Purchase New Product

- Purchasing agents – Attitude toward switching and subjective norms were found to be significant
  - Doctors – None of the variables were found to be significant predictors
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# Attitudes toward Medical Textiles: Nurses

Randi Alfrey and Margaret Rucker  
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# Objectives

- To assess nurses' perceptions concerning transmission of infections in hospitals
- To examine their willingness to take various types of preventive action to reduce their level of risk

# Sample Selection

- Nurse managers at a major western university were asked to distribute questionnaires to registered nurses in their units for completion and mailing back to the researcher
- Of the 129 questionnaires that were distributed, 55 were returned for a response rate of 41%

# Demographic Data

- Years in specialty ranged from 1 to 34 with a mean of 14.1
- The most common specialties were medical/surgical (33%), intensive care (33%), and transplantation (11%)



# Attitudes toward Nosocomial Infection and Protective Clothing

- The majority (58%) indicated their level of knowledge about nosocomial infection to be moderate.
- About half (49%) felt that the type of protective clothing currently available to them in the workplace was adequate to protect them from all unhealthy job conditions

# Attitudes toward Nosocomial Infection and Protective Clothing

- Textile products, including nurses' uniforms and patients' gowns, scored relatively low in terms of perceived infection transmission.
- Hands scored the highest in terms of perceived infection transmission.

# Factors Influencing Decisions about Use of Protective Clothing (scored above 3 on 4-point scale)

- Patient safety 3.43
- Inservice/health education 3.36
- Hospital protocol 3.35
- Fear of contaminatiton 3.25