



# That Skimpy Hospital Gown Patients Hate: Project Seeks to Find an Alternative

Developing a new health care garment for patients

## SUMMARY

During 2006–2008, a team at [North Carolina State University College of Textiles](#) in Raleigh investigated possible designs for a new patient gown and the market opportunity for such a product.

The work was the first phase of an effort to create an innovative, functional and aesthetically pleasing health care garment to replace the skimpy, tie-in-the-back gowns now widely used by hospitals and—for reasons of modesty and comfort—widely disliked by the people who wear them: the patients.

The team surveyed patients, health care providers and hospital purchasing agents to get their perspectives on the issue. The team also:

- Conducted focus groups with hospital nurses.
- Interviewed those who manufacture and distribute patient gowns.
- Reviewed existing patents on health care garments as well as academic and popular literature on the topic.

## Key Results and Findings

- Analysis of survey results revealed that patients, health care providers and those in the supply chain had different priorities for the design of a new patient garment. The team's synthesis of the relationship of these priorities will inform the next phases of the effort to develop a new patient garment.
- There have been many past attempts to introduce new patient garments and "modesty accessories," such as supplemental robes, but none of these products has won broad acceptance.
- Sixty percent of the former hospital patients surveyed said they "disliked" or "disliked very much" wearing the traditional hospital gown; 45 percent reported the gown was uncomfortable.

- Of the physicians, nurses and other hospital caregivers surveyed, 79 percent said the patient gown "sometimes" interfered with administering IVs, catheters, feeding tubes or other medical devices. Asked if they thought the gown affected the patient's emotional well being, 69 percent said "sometimes" and 19 percent said "always."

## Funding

The Robert Wood Johnson Foundation (RWJF) supported this *solicited* project with a \$225,532 grant.

## THE PROBLEM

Anyone who has been a hospital patient or undergone an outpatient procedure has worn it—the thin, flimsy tie-at-the-back smock that does so little to shield the posterior from drafty air and wondering eyes. Probably no piece of clothing known to humankind evokes a response more universal than the patient gown: "You want me to wear *that*?"

Rosemary Gibson, a senior program officer at RWJF, calls this immodest apparel "cadaver cloth." The punch line: "Because it must have been designed for people who would never get up and walk around in it."

Yet, despite the embarrassment and discomfort it unfailingly engenders, the patient gown is a staple of American health care and has been for years. While medical procedures, technology and facilities continually undergo revolutionary innovation, the standard, hospital-issued gown has remained essentially unchanged since it was originally designed in the 1920s.

While abhorred by the people who wear it, the patient gown has qualities that account for its widespread use: it is simple, low in cost and maintenance and provides health care providers easy access to the patient's body for monitoring and procedures.

## CONTEXT

The Pioneer Portfolio, one of RWJF's seven major areas of funding, supports innovative ideas that may promote breakthrough changes that can improve the health and health care of the American people.

RWJF staff saw such potential in a redesigned patient gown. Given near-universal dissatisfaction with the style now widely used, its retirement offered an opportunity to enhance people's feelings of dignity and comfort when seeking medical treatment.

However, members of the Pioneer team also understood that if a new gown were to be designed and brought to market for large-scale use, it would have to meet the needs of

not just patients but also clinicians and the various interests along the supply chain: manufacturers, distributors, hospitals and other purchasers.

Staff discussed the issue with the leadership of the [North Carolina State University College of Textiles](#), a leading research institution in textile science, technology and industry practice. Subsequently, the college proposed to develop an innovative, functional and aesthetically pleasing health care garment.

## THE PROJECT

During 2006–2008, a team at North Carolina State University College of Textiles in Raleigh investigated the requirements for a new patient garment and the market opportunity for such a product.

The team surveyed patients, health care providers and hospital purchasing agents and conducted focus groups with nurses and interviewed stakeholders in the supply chain. The team also reviewed the existing patents on health care garments as well as academic and popular literature on the topic.

The work was the first phase of a planned multiphase effort to develop a garment that would satisfy patients' desire for modesty and dignity and also meet the needs of caregivers and suppliers.

A. Blanton Godfrey, PhD, dean of the college, and Traci A.M. Lamar, PhD, associate professor, co-directed the project. The team also included three graduate students and three undergraduates.

## Surveys

The project team conducted four surveys:

- **Patients:** The team surveyed a random sample of 2,600 individuals drawn from a mailing list of patients who had had recent stays (December 2007 or January 2008) at an 870-bed health care system based in Raleigh, N.C.

The questionnaire, which could be returned by mail or filled out online, focused on respondents' views of—and experiences with—the gown. The response rate was 20 percent, and the average age 54.

- **College community:** Because older people dominated the hospital patient sample, the team subsequently surveyed a convenience sample of 66 College of Textiles students, professors and other staff on their personal feelings associated with wearing a patient gown.

Unlike the original patient sample, these respondents—who were solicited through the college listserv—had not necessarily been hospitalized recently. Also, 85 percent were under the age of 30.

- **Caregivers:** The team surveyed a sample of 1,200 health care facility employees on their views of the patient gown. The sample included 72 physicians, 530 registered nurses and various other clinical professional and support staff—all with direct contact with patients. The response rate was 17 percent.
- **Purchasers:** The team developed a survey to identify the needs and views of individuals responsible for purchasing patient gowns for hospitals and hospital alliances. The response, however, was disappointing.

The team solicited survey participation by telephoning a total of 192 medical facilities in North Carolina and three geographically dispersed states: Alaska, California and Texas. Based on contacts identified by those calls, the team sent out 70 questionnaires, only a few of which were returned, the team reported.

## Qualitative Data

In addition to the purchaser survey, the team interviewed hospital purchasing directors and agents and sales representatives for companies that supply health care garments. Team members also attended an industry trade show in Nashville, Tenn., and visited a hospital laundry operation to learn about the patient garment business and make contacts in it. An area health care alliance helped provide access to those in the supply chain.

To better understand caregiver requirements, the team conducted six focus groups with personnel—primarily nurses—at four hospitals, three in North Carolina and one in Massachusetts.

## Communications

Team members made three presentations on the project at the annual meeting of the International Textile & Apparel Association in November 2008. The *Wall Street Journal* described the project in an article published on May 11, 2009. (See the [Bibliography](#) for details on both.) As of early 2009, preparation of journal articles on the project was ongoing, the team said.

## RESULTS AND FINDINGS

The team reported the following at the end of the project:

### Results

- **The team identified and prioritized the key requirements of patients, health care providers and those in the supply chain for a new patient garment and**

**synthesized the relationship of these priorities.** The synthesis will inform the subsequent phases of the effort to develop a new patient garment, the team told RWJF.

In an end-of-project report to the Foundation, the team illustrated this synthesis with a table showing the relative importance (strong, moderate or weak) that each of the three groups attached to 17 key requirements. For example, the table showed:

- The requirement for *dignity/modesty* had a strong relationship to patients and a moderate relationship to health care providers and supply chain participants.
- *Accessibility* to the patient for medical procedures had a strong relationship for providers, a moderate relationship for patients and a weak relationship for the supply chain.
- *Life-cycle cost* and *life-cycle durability* each had a strong relationship for suppliers, a moderate relationship for providers and a weak relationship for patients.

See [Appendix 1](#) for the table.

Elaborating in a March 2009 interview, Lamar, the co-director, said that identifying these 17 key requirements and the differing priorities attached to them will enable the team to design a prototype garment that addresses the needs of all three interests—the two user groups (patients and caregivers) and the suppliers.

Lamar conceded it is a challenging task but said the requirements of the three groups, while different, are not diametrically opposed or mutually exclusive. As an example, she cited durability, saying patients have little interest in how many times a garment can be used but are not opposed to one that is durable.

## Findings

The project team reported these findings:

- **There have been many past attempts to introduce new patient garments and "modesty accessories," such as supplemental robes, but none of these products has won broad acceptance.**

"Even garments that received extensive publicity with their introduction into specific hospitals were not as extensively adopted as anticipated," the team said in its report to RWJF.

This finding—which was based on the review of literature and patents—makes it apparent that a garment must provide more than patient modesty if it is to be successful, the report said.

While attractive as clothing, many of the attempted new designs proved to be of limited use because of cost considerations or because they restricted caregiver access to the patient's body, Lamar said.

- **Most facilities use mainly the "center back tie with overlap" style of gown.** The life cycle of this garment was reported to be between 41 and 60 washings under harsh conditions. Other market-opportunity information included:
  - *Pricing:* One vendor quoted \$60 per dozen gowns, another \$3 to \$9 per single gown.
  - *Laundry costs:* From 26 cents to 60 cents a pound.
  - *Potential usage:* More than 30 million in-patient visits per year, based on 2001 data.
- **There are "hidden costs" to the traditional patient gown.** Lamar said these include the tendency of some patients to wear—for reasons of modesty—more than one garment at a time. Also, the tie closures can become knotted, in which case hospital personnel sometimes cut the ties because of time constraints or frustration, according to Lamar, one of the investigators.
- **Most purchasing agents have no accurate way to measure satisfaction with the hospital gowns used in their facilities.** One hospital laundry service operator noted the subject was not included in the satisfaction survey given patients when they leave.
- **Purchasing agents seem to receive information about newly patented garments mainly from their suppliers.**
- **Sixty percent of the respondents in the patient survey "disliked" or "disliked very much" wearing the traditional hospital gown; 45 percent reported the gown was uncomfortable.**

Half of the respondents said they wore the gown while walking the hospital hallways and 85 percent of those said they disliked that experience. The team's report to RWJF added, "It is important to note that research suggests a link between walking and the rate of healing."

— See [Appendix 2](#) for more complete survey results.

- **Of the 66 college community survey respondents, the team reported that 75 percent "provided a negative comment" about the gown, and "many shared that their mobility was limited because they feared exposure."**
- **Of the surveyed caregivers, 79 percent said the patient gown "sometimes" interfered with administering IVs, catheters, feeding tubes or other medical devices.** Another 8 percent of the respondents indicated that it always interfered. Asked if they thought the gown affected the patient's emotional well being, 69 percent said "sometimes" and 19 percent said "always."

Almost all of the caregivers surveyed said there was a need for patients to wear a hospital-issued gown of some kind: 51 percent said there was a need "sometimes" and 47 percent said "always." Lamar said the reasons cited included accessibility to the patient's body, differentiation of patients from no patients and sanitation.

Asked how important it was that the patient gown design be changed, 52 percent said "very important", 11 percent "important," 29 percent "unimportant" and 7 percent "very unimportant."

For more complete results of the caregiver survey, see [Appendix 3](#).

## SIGNIFICANCE TO THE FIELD

This research represented the first scientific effort to investigate the requirements for patient apparel from the perspective of the multiple interests involved, the team told RWJF. The project demonstrated an approach to assessing requirements for a product that must meet the needs of multiple users simultaneously, the team said.

## LESSONS LEARNED

1. **Allow an extended time period and be persistent when trying to obtain information from stakeholder groups.** The literature review was invaluable in identifying key stakeholders in the patient-garment supply chain. However, even then it took time and effort to get the desired data. When a written survey of hospital purchasers drew little response, the team obtained input by contacting individuals by phone and attending an industry trade show. (Project team report to RWJF)
2. **The patient garment supply chain is complex, and there is no simple strategy for understanding it.** Medical facilities get their patient garments through a variety of channels involving a diversity of agents. Only by spending time to build a network of contacts can researchers learn the ins and outs of the business—and the business needs that a new design must meet. (Project team report to RWJF)
3. **When planning a survey or focus group involving staff of a health care facility, get the support of the facility's upper-level administration.** Convincing hospital administrators of the value of this project went a long way in garnering a positive response from their employees. (Project team report to RWJF)
4. **Be flexible when scheduling a survey or focus group involving staff of a health care institution.** Data gathering by outside researchers places extra demands on staff of medical facilities. Consequently, supervisors are careful to schedule research activities so that not too much is being asked of workers at any one time. (Project team report to RWJF)

## AFTERWARD

At the conclusion of this grant, the team prepared to take the next step in development of a new patient gown: design, production, wear-testing and evaluation of prototypes. As of May 2009, the team had submitted a proposal to RWJF for funding to support this second phase.

Plans called for a third phase to focus on incorporating value-added features to a newly designed garment. Lamar said possibilities include anti-viral and anti-bacterial properties to help fight infection in the hospital environment and electronic components to facilitate patient monitoring.

While the team hopes to develop a gown that eventually will be produced and sold, the project is a research effort and does not entail commercialization, Lamar said.

---

**Prepared by: Michael H. Brown**

Reviewed by: Kelsey Menehan and Marian Bass

Program Officer: Rosemary Gibson

Grant ID# 58514

---



## APPENDIX 1

### Synthesis Chart of Key Requirements and Their Relationship to Patients, Providers and the Supply Chain

(Current as of the end date of the program; provided by the program's management; not verified by RWJF.)

The project team's January 2009 report to RWJF included the following:

*As illustrated by this brief summary of key results, we were able to meet our proposed objective of conducting an analysis that was representative, and exhaustive. Our ability to delineate and prioritize health care garment requirements is evidenced by our successful effort to synthesize and prioritize these results. Although the complete analysis is impossible to include, and minimally useful, sample results which will inform the work of Phases 2 and 3 are shown below.*

#### Key Requirements and their Relationship to each Stakeholder Group

- x Strong Relationship
- o Moderate Relationship
- + Weak Relationship

Requirements	Patients	Providers	Supply Chain
Holders	o	+	+
Physical Comfort	x	o	o
Fit	o	o	+
Dignity/Modesty	x	o	o
Psychological comfort/Aesthetics	x	o	+
Support patient mobility	x	x	+
Easy to don/doff handling	o	x	+
Accessibility for procedures	o	x	+
Visual monitoring	+	o	+
Supports healing	x	x	o
Branding	+	o	+
Availability	+	+	x
Lifecycle cost	+	o	x
Quality	x	x	x
Inventory	+	o	x
Lifecycle/Durability	+	o	x
Universal design	+	o	x

## APPENDIX 2

### Patient Survey Results

*(Current as of the end date of the program; provided by the program's management; not verified by RWJF.)*

Members of the project team included the following in a November 2008 presentation to the annual meeting of the International Textile & Apparel Association.

- 45% of patients reported that the gown was uncomfortable.
- 55% of patients reported that the gown fit either poorly or very poorly.
- 39% of patients either disliked or disliked very much the feel of the gown on their skin.
- 50% of the patients reported walking the hallways in the gown. Of that figure, 86% disliked the experience.
- 61% of patients reported either liking or liking very much to wear pants with their gown.
- 55% of patients reported either liking or liking very much to wear shorts with their gown.
- 81% of patients reported being able to dress themselves during either all or some of their hospital stay.

## APPENDIX 3

### Caregiver Survey Results

*(Current as of the end date of the program; provided by the program's management; not verified by RWJF.)*

Members of the project team included the following chart in a November 2008 presentation to the annual meeting of the International Textile & Apparel Association.

Questions	V Imp (VI)	Imp (I)	Un Imp (UI)	V Un Imp (VUI)	Never (N)	Some- times (S)	Always (A)	Total
1 Does the patient gown interfere with administering IVs, catheters, feeding tubes or other medical devices?					13%	79%	8%	87% (A+S)
2 Does the current patient gown meet your requirements to access a patient's body areas during examinations?					5%	65%	29%	70% (N+S)
3 Do you think that the patients you treat need to wear hospital issued gowns?					2%	51%	47%	98% (S+A)
4 Do you think that the current patient gown affects the patient's emotional well being?					12%	69%	19%	88% (S+A)
5 Do you think that the current patient gown affects the patient's physical well being?					34.2%	58.2%	7.7%	66% (S+A)
6 How important is it that the design of the patient gown is changed?	52%	11%	29%	7%				63% (I+VI)

## BIBLIOGRAPHY

(Current as of date of the report; as provided by the grantee organization; not verified by RWJF; items not available from RWJF.)

### Books

Jha S. *Exploring Design Requirements for a Functional Patient Garment: Hospital Caregivers' Perspective*. (Master's degree thesis) Raleigh, NC: North Carolina State University, 2009. Available through North Carolina State University Library.

### Survey Instruments

"Hospital Gown Survey for Patients," North Carolina State University College of Textiles, fielded February 2008.

"Hospital Gown Survey for Patients," (In Spanish) North Carolina State University College of Textiles, fielded February 2008.

"Patient Gown Survey for Health Care Providers," North Carolina State University College of Textiles, fielded February 2008.

"Patient Gown Survey for Purchasing," North Carolina State University College of Textiles, fielded March–December 2008.

### Presentations and Testimony

S. Jha and T. Lamar, "Analysis of Design Requirements for a Functional Patient Garment: Health Care Providers' Perspective," at the International Textile & Apparel Association Annual Meeting, November 5–8, 2008, Schaumburg, IL.

T. Lamar and L.S. Hatch, "Assessing the Patient Requirements for Hospital Apparel," at the International Textile & Apparel Association Annual Meeting, November 5–8, 2008, Schaumburg, IL.

G. Samson, K. Welsh and T. Lamar, "Factors Influencing Purchasing Agents' Choice of Hospital Gowns," at the International Textile & Apparel Association Annual Meeting, November 5–8, 2008, Schaumburg, IL.

L. Hatch and T. Lamar. (2009) "Assessing the Requirements for Hospital Apparel," oral presentation at the 2009 AATCC International Conference, March 10–12, 2009, Myrtle Beach, SC, presented Thursday, March 12, 3:15 p.m.

### Press Kits and News Releases

L. Lagnado. "The Hospital Gown, Fashion Malady, Worries Would-Be Redesigners Sick—Style Statement versus Cost Savings; 'We Have Created a Product Nobody Likes.'" *The Wall Street Journal*, May 11, 2009, page 1, The Dow Jones Company.

J. Ruffin. "Hospital Gown Getting Redesign, NCSU Team Aims to Please Patients," *The News and Observer*, April 19, 2009, page 1, picked up by the Associated Press and published in more than 150 outlets.