Towards More Elder Friendly Acute Hospitals: A Program of Research Focused on the Physical Environment of Hospitals in the Fraser Health Authority

Final Report

Study 1: The Physical Environment in ACE Units: Design Specifics and Staff Ratings

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Submitted to:

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Introduction

Three facts about seniors are well known: (1) their numbers and proportion in the population served by the Fraser Health Authority (FHAA), the province and the country are increasing; (2) they constitute a substantial proportion of the inpatient hospital population. It has, in fact, been estimated that in most jurisdictions nationally and internationally, they may constitute the majority in medical and surgical wards other than pediatrics or obstetrics/gynecology; (3) a third fact is that substantial proportions of seniors have accidents in hospitals and/or lose functional status between admission and discharge at a rate above and beyond what is to be expected from their admitting diagnosis. While there may be various contributing factors, the focus of the study described in this report, and the broader project of which it is a part, is on the physical environment. A key question is whether there are aspects of the physical environment of hospitals, and in particular, interior design of patient private and public areas, that can be altered in ways that will improve older patient outcomes.

As a first step in attempting to answer this question, a literature search was undertaken (Gutman, 2005) to identify critical elements of the physical features of an elderly friendly acute hospital environment. Five major seniors' and health-care related databases were searched using a Boolean technique that was focused on older adults, acute care hospitals, and key words relating generally to the physical environment. Key words relating to individual design elements such as noise, light, single vs. multiple patient rooms were not used because much of the research on these elements was reviewed by Ulrich, Quan, Zimring, Jospeh and Choudary (2004) in a document entitled *The Role of the Physical Environment in the Hospital of the 21st Century*.

Very early on in the search it became evident that while there was a large literature on Environment and Aging, much of it was anecdotal and, the bulk dealt with the residential environment and the long term care sector (i.e. with seniors housing, assisted living facilities, and long term care facilities). Where the hospital design literature referred to seniors, it too was focused mainly on long term care. Further, while many authors recognized that the exterior and interior design of the physical environment may contribute to accidents, declines in functional status, iatrogenic illness, social isolation, depression, confusion, etc. in hospitalized elderly, there were few reports of activities in the acute care sector that had tangibly built on this knowledge. The exception concerned the development of Acute Care for Elders (ACE) units.

An ACE unit is an area within a larger hospital that is specialized for acute care of the elderly. The ACE model has four key elements: a 'prepared environment', a philosophy of patient-centred care, interdisciplinary team rounds and discharge planning, and medical care review (Palmer, Counsell & Landefeld, 1998). A fifth element commonly identified in the literature is specific admission criteria.

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Randomized controlled trials are the gold-standard in health-related research in terms of determining the efficacy of an intervention. Using this research methodology, ACE units have been found to produce positive patient outcomes. However, the relative contribution of each of the four elements has not been determined. As Landefeld (2003) notes, a necessary next step is to "...develop and test microsystem changes that help patients and determine what makes them work" (p.424).

The "Towards More Elder Friendly Acute Hospitals Project"

While it is recognized that specialized geriatric acute care wards based on the ACE model are desirable, these are not the focus of this research. Rather, its aim and that of the larger project of which it is a part is to improve the elder friendliness of general medical and surgical wards in hospitals in the Fraser Health Authority. The rationale for this focus is that larger numbers of seniors are served by these units than by ACE units.

It was felt however, that there were lessons to be learned from ACE units. In particular, we were curious to determine exactly what they had done in the process of constructing a "prepared environment" and which design elements they had found enhanced the health, safety and/or functional status of hospitalized elders. This information is not readily available in the literature, even in papers describing the ACE units participating in randomized control trials.

To fill the information gap about the physical environment of ACE units and to answer other questions that might advance knowledge about elder friendliness as it relates to seniors in hospitals, a four-study program of research was proposed to Fraser Health in March, 2004.

Study 1 would survey existing ACE units in the USA, where an estimated 25-30 were thought to have been established. The survey would ask for details concerning their physical environment, as well as for elder friendliness ratings and performance ratings (safety, ease of maintenance, durability) of specific design elements.

Study 2 would assess existing medical and surgical units in FHA with respect to their elder friendliness. It would use a mixed-method: 1) site visits in which research staff would fill out a checklist, take video and still photographs, and take sound and light readings in 6 of the 12 FHA hospitals and 2) focus groups conducted with staff at each of the participating hospitals. Its purpose was to test the hypothesis that, as in most other jurisdictions, hospitals in FHA would exhibit only minimal compliance with design guidelines found in the Environment and Aging literature.

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In Study 3, which would take place in the SFU-BCIT Living Laboratory, a "typical" FHA patient room and en-suite bathroom would be mocked up as well as a more "ideal" version of each. Frail elders would be recruited to come into the Living Lab and user-test both. In particular, we wished to compare the "typical" and "ideal" patient rooms and bathrooms in terms of their ability to support three functions:

- safe transfer from bed and a chair
- comprehension of post-discharge instructions
- safe self-toileting

The fourth deliverable was a proposal for Study 4, in which modifications pilot tested in the Living Lab would be tested in a "real" hospital setting with "real" patients.

Content and Organization of this Report

This report focuses on Study 1. The next section describes the procedure that was followed in identifying and contacting ACE Units and the information that we asked them to provide. This is followed by a description of our findings. Study 2, completed in November, 2005, is the subject of a separate report (Gutman, Sarte, Parke & Friesen, 2005). Study 3 is currently under development. Development of the proposal for Study 4 will commence upon completion of Study 3.

Method

During Summer 2005, we attempted to identify and contact all ACE units in the USA. The search for ACE units included electronic search-engines, follow-up of articles in the gerontological, geriatric and hospital design literature, as well contacting the founders of the ACE units that were the subject of the randomized control studies. One of these was a part of the SUMMA Health System, located at the Akron City Hospital, in Akron, Ohio. A staff member of the Akron unit was found to be compiling a data-base of other ACE units in the USA for networking purposes. We amalgamated our list and hers. By September, 2005 we had identified 31 hospitals believed to have ACE units. As shown in Table 1, these were located in 17 different states.

Telephone calls to these hospitals indicated, however, that four had previously had ACE units but that these were now closed, three were in process of developing ACE units, two did not consider their unit to be/nor meet the criteria for an ACE unit and one did not respond to repeated telephone calls. The remaining 21 agreed to have a survey sent to them. Three declined to participate in the study after seeing the survey, two started the study but withdrew due to the time required to complete the survey, and one withdrew because the unit closed. **Eight hospitals have returned completed surveys and are the subject of this report.**

Table 1 – Potential Participating ACE Units and Status at January 17, 2006

State	Hospital	Complete	Outstanding	Did Not Fit Criteria	Not an ACE Unit Yet	Unit Closed	With-drawn	Declined or No Response
Connecticut	Greenwich Hospital							
Delaware	Christiana Hospital	X						
Florida	Florida Hospital – Orlando				X			
Georgia	DeKalb Med. Ctr.					X		
Indiana	Wishard Memorial Hospital	X				X		
Kansas	Wesley Med. Ctr.						X	
Maine	Maine Med. Ctr.	X (Pictures)						
Michigan	Detroit Receiving Hospital		X					
	Spectrum Health Hospital						X	
Missouri	Des Peres Hospital		X					
	Barnes-Jewish Hospital		X					
	Saint Louis University Hosp.							X
New Jersey	Virtua West Jersey Hospital, Berlin	X (Pictures)						
New York	Highland Hospital							X
	Mount Sinai Hospital	X						
	New York Presby Hosp.		X					
	Buffalo General Hospital							
	Maimonides Med. Ctr.	X				X		
	North Shore Univ. Hosp.							X
	St. Vincent's Hosp. Manhattan							X
Ohio	Summa Health System	X (Pictures)						
	Univ. Hosp. of Cleveland					X		
Oklahoma	University of Oklahoma					X		
Pennsylvania	Moses Taylor Hospital			X				
	University of Pennsylvania				X			
	Warminster Hospital							
Texas	John Sealy Hospital		X					
	Longview Reg. Med. Ctr.		X					
Washington	Virginia Mason Med. Ctr.		X	X				
Wisconsin	Aurora Sinai Med. Ctr.	X						
	Aurora St. Luke's South Shore				X			

Three of the hospitals that returned completed surveys have also returned disposal cameras containing photos of their ACE unit.

A copy of the request for ethics approval submitted to SFU on behalf of the study team and of the Ethics Certificate issued by SFU may be found in Appendix 1. Appendix 2 contains the letter sent to unit Managers inviting their participation in the study. Appendix 3 contains a copy of the survey instrument.

Findings

1) General Characteristics of the Participating ACE Units

Years since opening

The Akron hospital ACE unit, hereafter referred to as the "gold-standard" unit, was opened in 1994 and has been operating continuously since establishment. Of the remaining seven units, one opened in 1996, one in 1998, one in 2000 and four in 2004.

Renovated vs. purpose-built

All eight of the ACE units that responded to the survey had been established in pre-existing units; none was purpose-built.

Extent of implementation of ACE components

As indicated above, the literature identifies five distinguishing features of ACE units:
- A "prepared" environment
- Interdisciplinary team rounds and discharge planning
- A focus on patient centered care
- Medical care reviews
- Specific admission criteria

Five of the eight units reported having a "prepared" environment at the time they were established. As will be described below, examples of "preparation" included installation of carpet and/or wallpaper, patterned window treatments and a concerted effort to make the atmosphere less institutional.

All eight reported having interdisciplinary rounds and discharge planning and specific admission criteria. Seven of the eight units reported a focus on patient-centered care and six of eight as having medical care reviews.

Unit configuration

Total beds and ratio of private to semi-private rooms

One of the ACE units that returned the survey originally had dedicated space but now places patients in any available bed in the hospital. The 7 ACE units that have dedicated space range in size from 20-58 beds. In one unit, all rooms are semi-private. In the remainder, the ratio of private to semi-private rooms was: 2:10; 6:14; 5:13; 8:6, 10:12; 21:6.

It is interesting to note that two of the six units with a mix of private and semi-private rooms stated that if they were able to redesign their ACE unit or create a new unit, they would opt for private rooms only; a third unit expressed a desire for more single rooms.

The respondent from the unit consisting of all semi-private rooms stated that "...more square footage in some rooms would be helpful – our rooms are not uniform in size". She went on to note that more space in the patient rooms was needed to ambulate patients since most require assistive devices.

Other concerns the respondents' had regarding semi-private rooms included noise and distraction during post-discharge instruction-giving (noted by 4 units). On the other hand, in one of the units with a mix of private and semi-private rooms, it was noted that "For some, double rooms improve socialization and safety – patients watching out for each other."

Number of nursing stations

Four have only a central nursing station, one has two nursing stations, one has a central nursing station with two sub-stations, the unit with 29 semi-private rooms reported having a central nursing station plus "...a mobile desk/chair for each RN assigned to four separate districts to improve monitoring of patients", while the unit with a mix of 5 private and 13 semi-private rooms reports having no central nursing station but rather, six mini-stations (one for every three rooms).

Therapy rooms

Only two units have a therapy room. Of those, one reported that it was under-utilized and does not recommend its inclusion in future ACE units. The reason given was "...therapies are done more in patient rooms, halls and parlour". Of the six without therapy rooms, two would recommend having therapy rooms – citing convenience as the reason, two do not recommend and two gave no response.

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Examination room

Only one unit has an examination room and it gave no response when asked if they would recommend one. Of the remaining seven without an examination room, one recommends including it, four do not recommend inclusion and two gave no response.

Interdisciplinary office

Five have an interdisciplinary office; four of these recommend it for future ACE units. One with an interdisciplinary office and two without gave no recommendation either for or against its inclusion.

Patient/visitor lounge

Seven of the eight units have a lounge. Six of these recommended it for future ACE units. Reasons included encouraging ambulation, socialization and family visits.

Staff lounge

All eight units have a separate staff lounge. Six explicitly recommend it while two gave no comment. One respondent described the staff lounge as a "...place to "get away" and added that it "...promotes team cohesiveness".

Dining area

Four of the eight units have a dining area. Three of the four recommend having one. The fourth did not respond. Of the four that do not have dining areas, two recommended having one, one did not recommend commenting that "...patients are generally too sick but a table in the lounge could accommodate the rare need" and the fourth did not respond.

Meeting/conference room

Seven of the eight units have a meeting/conference room. Six of the seven recommend it, while the seventh and unit without, did not respond.

Conversation nooks/alcove seating

Only two of the eight units have these. One recommends them, noting it is an "area for rest with walking down halls for patients... and ...areas for families to use for discussion". The second did not respond. Of the six that don't have them four would recommend them. It is interesting to note that their reasons include decreasing congestion at nursing station and "...helpful for brief family interactions and good goal for patient ambulation". Two did not respond.

Other

The only other room mentioned was a delirium room that is going to be implemented in the "gold standard" unit. They feel it will give them "...more effective management, use less meds and lessen the need for one-to-one sitter".

2) Interior Design Components by Area

Patient Bedroom

Alarm systems
i) Bed and/or chair alarms
At least four units have bed exit alarms (in two cases as part of the Advanta bed); one of these units also has chair alarms. All recommend these for other ACE units.
ii) Other
One of the units has a pull cord alarm on the wall behind the patient bed. The unit recommends its inclusion but it should be noted that its position on the wall would make it difficult for a patient to reach. Further, the cord does not extend to the floor and so, could not be reached in the event of a fall (see photo 4-8).

Flooring
Four of the seven units that reported their flooring type have linoleum in the patient rooms; all four gave their flooring a rating of 3 for elder friendliness, 3-4 for safety, 3-5 for maintenance and durability. One unit has tile flooring which they rate 3 in all categories. Two units currently have carpeting in patient rooms. Of these, one recommends carpeting, rating it a 3 for elder friendliness and safety and 4 for maintenance and durability. The other, the "gold standard" unit, started out with carpeting when the unit was established in 1994. In 1998 they replaced the carpet in 4 rooms "...because of incontinence issues". Currently, they are converting the rest of the rooms to non-skid tile.

Furniture
i) Beds
Three of the eight units use the Hill-Rom Advanta bed which they unanimously rate 5 on all domains (see photos 4-3, 4-5, 4-8). One of the units explicitly mentioned the safety and comfort provided by the bed's Zonaire mattress for prevention of decubiti. The bed's exit alarm and night lights were also mentioned as positive features. One of the remaining units uses the Stryker Secure II bed which was rated only 3 on a scale of 5 for elder friendliness and safety and 4 for maintenance and durability. In particular, it is not favoured because it does not go low enough to the ground. One unit reports a mix of Hill-Rom standard beds and Carroll low beds both of which are rated 3 on all domains.

Patient Bedroom
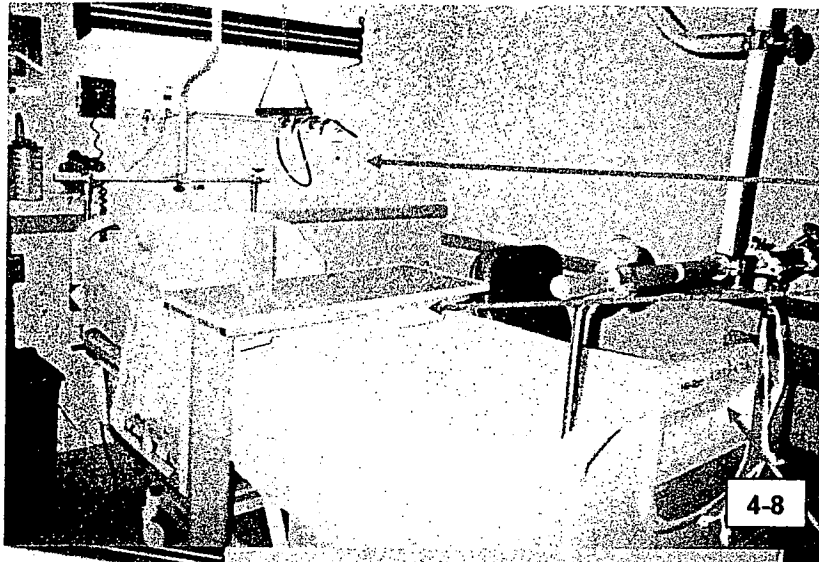
4-8
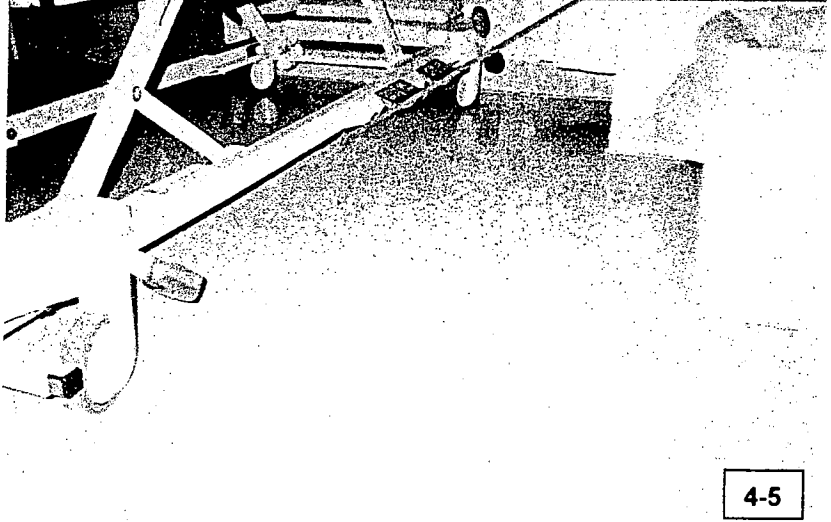- Inaccessible Pull-Cord
- Least favourably rated overbed table

4-3, 4-5, 4-8
- Preferred Hill Rom "Advanta" bed
- Zonaire mattress for the prevention of decubiti
- Night lights under bed frame

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ii) Seating

The units use a variety of regular, high-back and geri-chairs. The chair that received the highest rating (a 5 in all domains) is shown in photo 4-12. A chair receiving only a 3 rating in all domains is shown in photo 11-8.

iii) Overbed tables

The "gold standard" unit gave a rating of 4 on all domains to its overbed table. Most other units were less enthusiastic citing difficulty in adjusting their height, the fact that they do not lock in place and that they sit too high when patients are sitting in a chair eating lunch. The table receiving the lowest rating (2 in all domains) is shown in photo 4-8.

iv) Nightstands

A variety of nightstands are used in the participating units. Photo 11-14 shows a nightstand rated 3 for elder friendliness and safety and 4 for maintenance and durability. Photo 4-14 shows a nightstand rated 2 on all domains. One of the respondents noted that the nightstand is usually out of reach of patients.

v) Other

One unit mentioned an armoire which they rated as 5 in all domains, noting that "...it is simple to open, has drawers and hanging capacity.

HVAC

Only 3 units responded concerning HVAC in the bedroom, all noting that it was adjustable in each room. Two units recommended their systems; one gave it a 5 in all domains. The other rated it 5 for elder friendliness but did not indicated a rating for the other domains. The third system, a window unit, described as noisy, received a 3 for elder friendliness, safety and durability and a 2 for maintenance. It should be noted that although they are adjustable in each room, only one unit indicated that patients are able to control the temperature in their room. In this unit, the controls are by the door and are described as easy to operate except for having very small numbers.
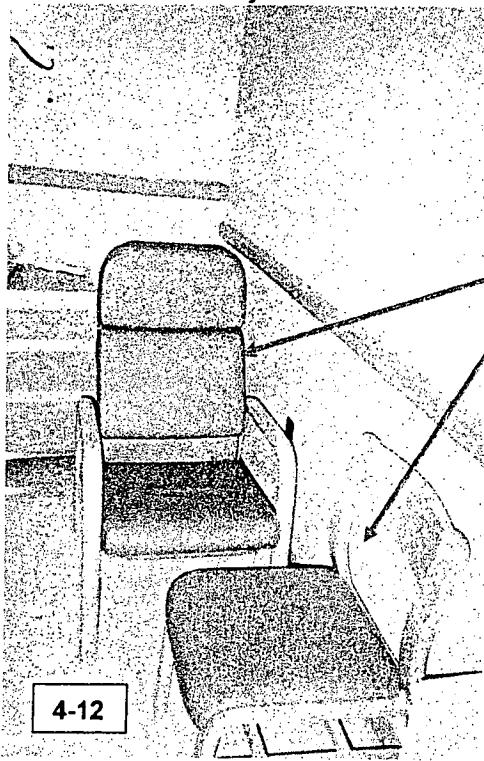
Lighting

i) Nightlights

Five of the eight units have nightlights in the patient bedrooms. In three of these units the nightlights are built into the frame of the Advanta bed. One has a nightlight in the overbed light. However it is described as insufficient. The fifth unit provided no details.

ii) Task and ambient lighting

Only one unit (#9) gave both its task and ambient lighting a 5 on all domains. Unfortunately no details are provided. Unit 4 gave their task lighting a 5 on all domains. As shown in photo 4-4 it appears that the top and bottom of the over-bed light fixture may be illuminated independently of one another. In contrast, unit 11 gave its overbed lighting a rating of only 1 for elder friendliness commenting that it did not provide "...enough adjustment for comfort of patients or for care" (see photo 11-10).

4-12
- Chairs rated '5' in all domains

11-8
- Chair rated '3' in all domains

4-12

11-8
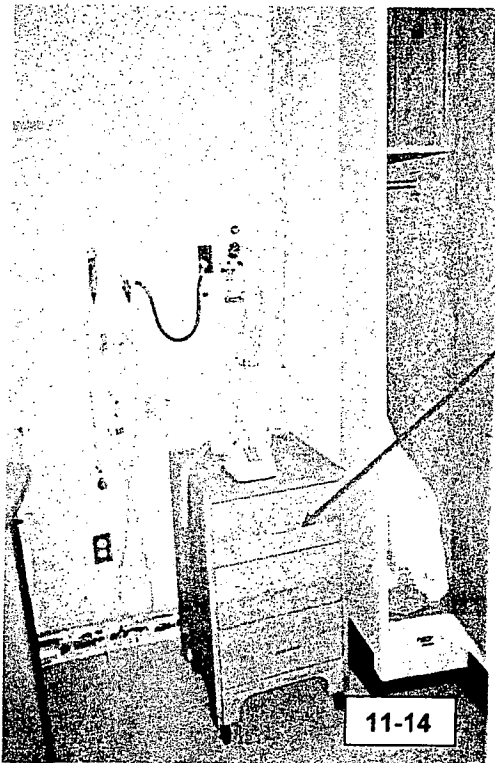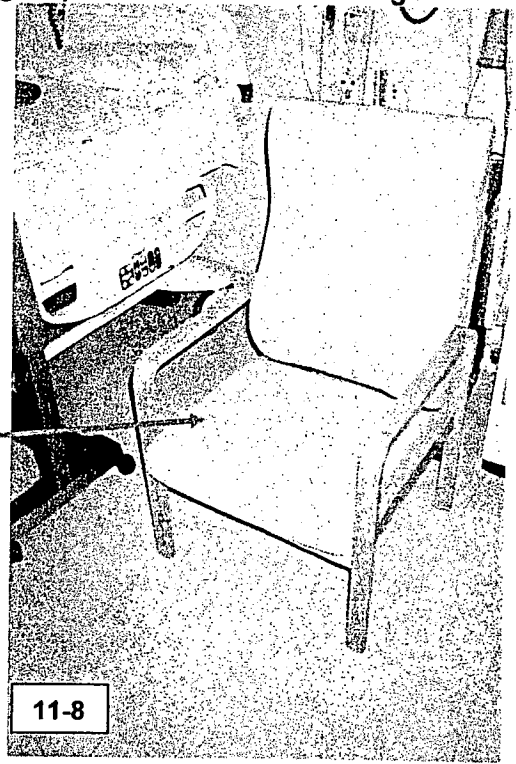
11-14
- '3' & '4' rated nightstand

4-14
- Nightstand rated '2' in all domains

11-14

4-14
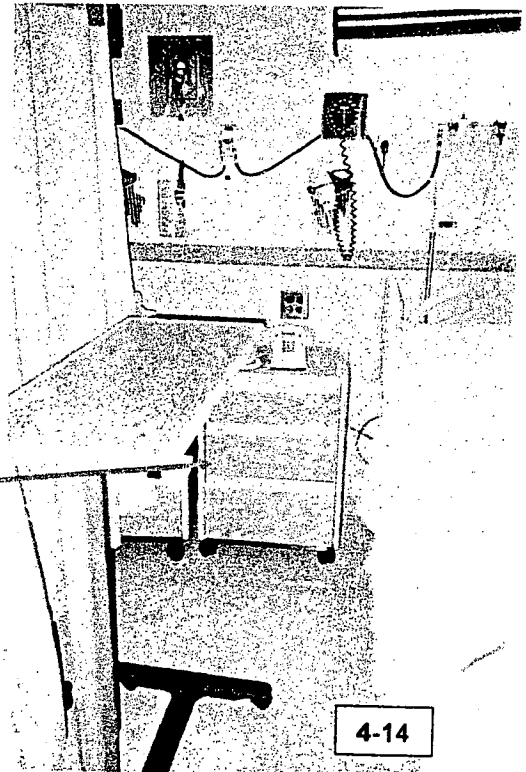
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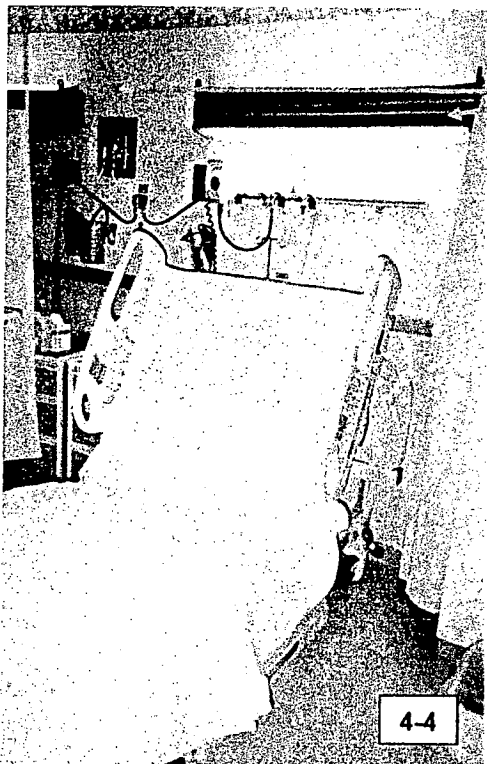
4-4
- Bed light with independently operating upper and lower light

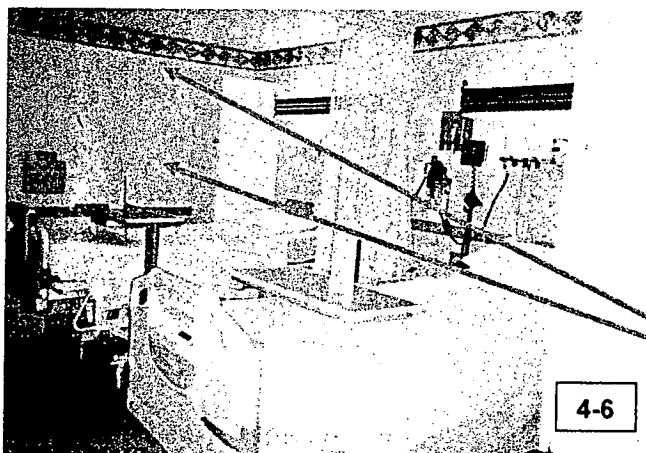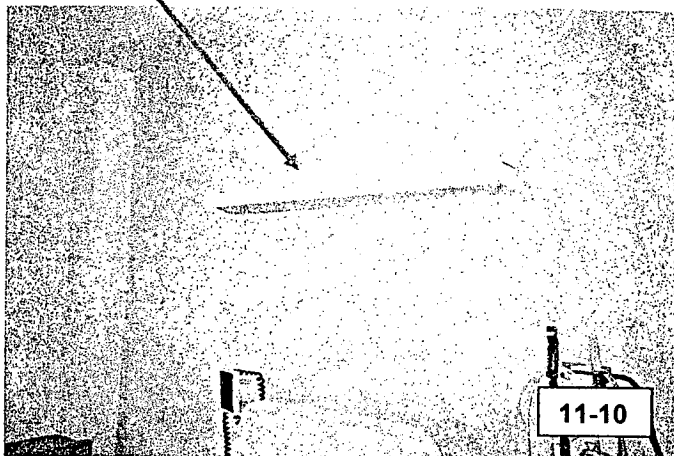**11-10**
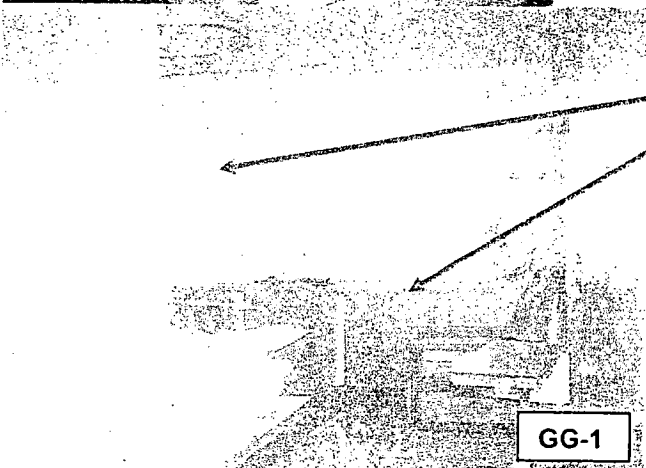- A '1' rated fixture, does not provide "...enough adjustment for comfort of patients or for care"

4-4

11-10

4-6
- Wallpaper and ceiling border

GG-1
- Wallpaper and wood paneling

4-6

GG-1

Five units reported that patients could control natural and artificial light levels, in one unit they could control artificial but not natural lighting, in one unit the situation was reversed i.e. they could control the natural not the artificial lighting, and in one unit patients could control neither. Of the units reporting that patients could control the level of artificial and natural lighting, none report that the means of doing so was elder friendly. To the contrary, they reported that controls were out of reach or that buttons were hard to read.

Six of the seven units reported that blinds acted as an effective method of controlling glare from windows.

Wall treatments
Six of the eight units have used wallpaper in the bedrooms at least as an accent (see photo 4-6 – wall paper on wall behind bed and as a ceiling border). One of the units has used wallpaper and wood paneling (see photo GG-1). Exclusive use of wall paper occurs in only one unit. Similarly exclusive use of paint occurs in only one unit.

Window coverings
Seven of the units have blinds and one has a pull down shade. Three of the units have decorative curtains and/or a valence. The pull down shade was not recommended. The reason was that although it eliminates glare, it darkens the room considerably. Blinds received elder friendliness and performance ratings that were mostly 3s. Vertical blinds were explicitly recommended against by one of the respondents, on the grounds that they are often difficult to adjust.

All eight units report that a view out the window can be seen by the patients while seated in their bed; seven of the eight reported views from chairs as well.

Other
Three of the eight units commented that on their walls they have art work, clocks and calendars, and in one unit also dry erase boards which help with orientation.

Five units indicated that patient has a place to store valuables. However, for three units this is with hospital security, one has a locking bedside table and one has an in-room safe.

Six of the eight units reported that patients could control privacy through the use of a curtain. Two units responded that patients could not control for privacy, one stating that a curtain does not really provide privacy.

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En-Suite Toileting/Bathing Facilities

Six of the units report en-suite toileting facilities, a seventh reports shared between two rooms and the eighth gave no response. Only one unit reports toileting facilities off the corridor and two, adjacent to lounges. Five of the eight units report showers in some or all patient rooms (e.g. in the "gold standard" unit, all private rooms have a shower while semi-privates do not. Two units report only having tub rooms and the eighth did not answer the question.

Alarm systems
Photos and/or written responses indicate that at least four of the units have an emergency pull cord in the patient en-suite shower and by the toilet. All recommend these indicating that they "...inform us when a patient needs help or in danger" (see photo 1-14).

Flooring
Only five units describe their flooring. Three have tile, one has linoleum and one, the "gold standard" unit, has carpeting. Overall, tile received the highest ratings.

Furniture and fixtures
A variety of grab bars are used in the ACE units. In some cases, we would question their elder friendliness with respect to size and positioning (1-17; 1-14, 11-11; 4-11)

Other recommendations for improving the elder friendliness of the patient en-suite toileting/bathing facilities revolved around accessibility. For example, one unit noted "...larger size. Our bathrooms are very small and cannot accommodate a walker or an extra individual to assist. We use a lot of bedside commodes". With respect to size, another unit commented that their bathroom was of insufficient size to accommodate a wheelchair or a commode. Other common themes included the need for higher toilets. Several are using raised toilet seats. One unit specifically recommended a raised toilet seat with handlebars. One unit noted that if there were higher toilets, they would not need to use commodes over the toilet bowl. One unit reported the effective use of signage – specifically, a picture of a toilet on the door to patient en-suite. While this is not "Homelike" it can aid orientation.

HVAC
Two of the units have temperature control systems (thermostat) in patient en-suite bathrooms. Both recommend their system.

Lighting
The "gold standard" unit gave top marks to the lighting in the en-suite bathroom. As shown in the photo they have pot lights in the ceiling as well as a three-sconce vanity light above the mirror, the latter giving the bathroom very much a home-like atmosphere (1-15 and 1-16). Another unit that rated its en-suite

En-Suite Toileting/Bathing Facilities

1-14

4-11
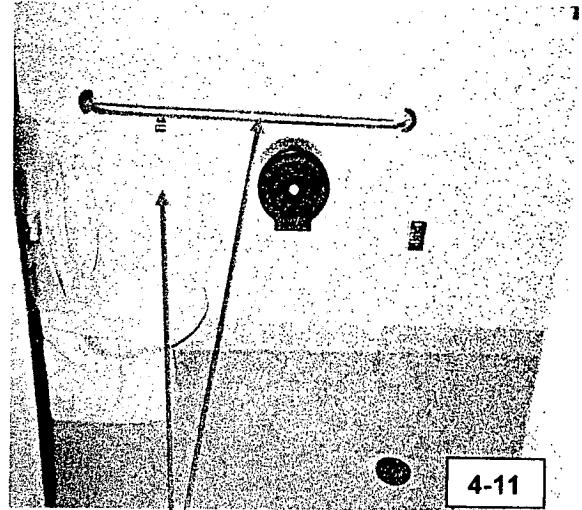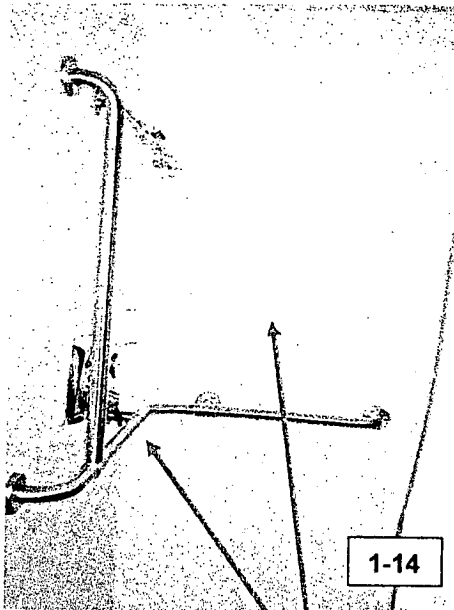
1-14, 1-17, 11-11, 4-11
- Emergency pull cords are recommended by all participants.
- Grab bars are also recommended. They are present in a variety of shapes, sizes and positioning.

1-17

11-11
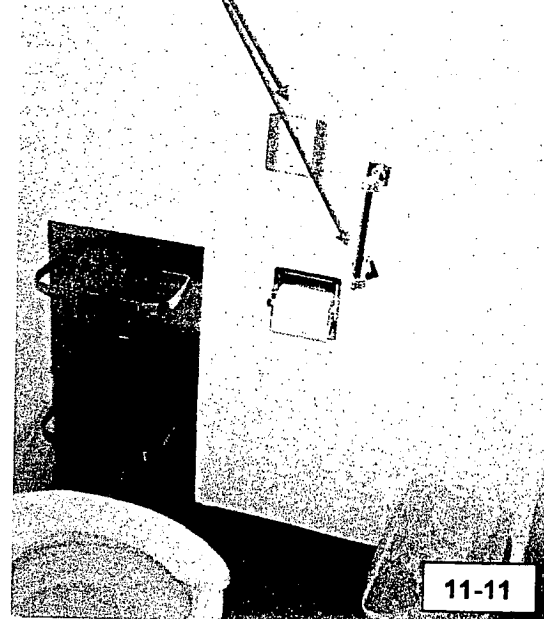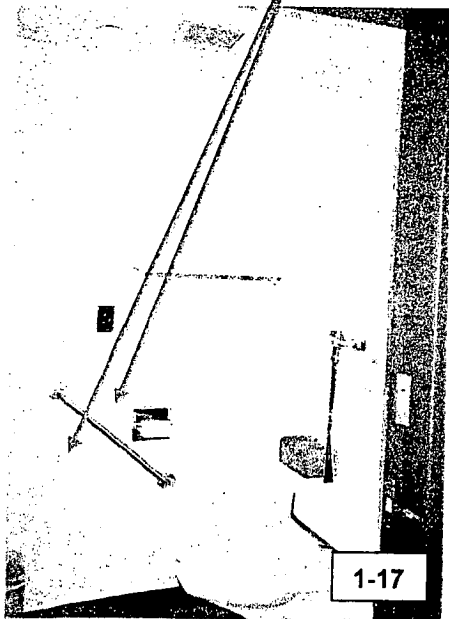
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lighting with top marks (i.e. a 5) has achieved brightness but with a distinctly institutional fixture (see photo 4-20).

Wall treatment
The home like atmosphere is enhanced in the "gold standard" unit bathrooms by textured wall paper and an oak toiletry cabinet (photo 1-15 and 1-16). The wall paper gets top marks for all domains.

Tub Room

Alarm system
Photos and/or written responses indicate that at least four of the units have an emergency pull cord in the common bathing/shower area patient en-suite shower and by the toilet.

Flooring
Of the four that have tub-rooms, three have tile floors and one has linoleum. Ratings in all domains are in the 3-4 range.

There were only a small number of recommendations for common tub/shower facilities. These included non-skid tiles on the floor and handrails for patients to grasp as they move around. Offering choice is also important, as one unit stated "..a tub room would be a great addition (geri-friendly type), [it] can be used for patients who prefer baths".

Furniture and fixtures
Four units use and recommend a chair or bench in the common bathing/shower areas. It should be noted that these are sturdy chairs not just plastic garden chairs as had been seen in some of the Study 2 site visits to FHA hospitals (see photos 1-22; 11-16; 4-22).

All common bathing/shower areas have grab bars (see 4-21 for positioning).

Hallways and Entrance

Alarm system
Three of the eight units have a wanderer-alert system at the entrance to the unit and stairways (in two Wanderguard is specified – see photo 1-25). The Wanderguard system was estimated to cost $14,000-$15,000 USD depending on number of exits, plus $30 per re-usable bracelet. All three units recommend their systems it but caution that the bracelet worn by the patient may "...get lost, thrown away or sometimes flushed!"

1-22

4-22
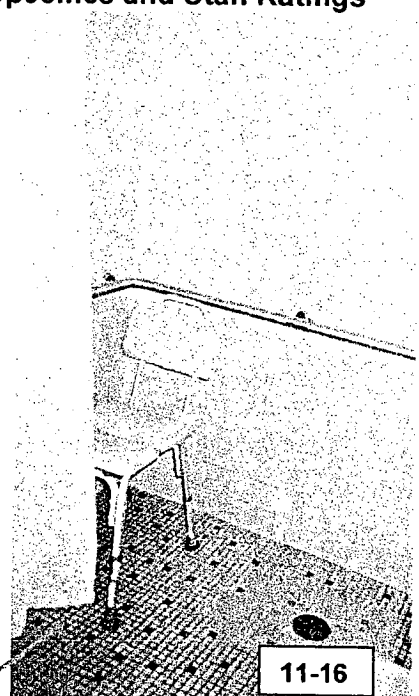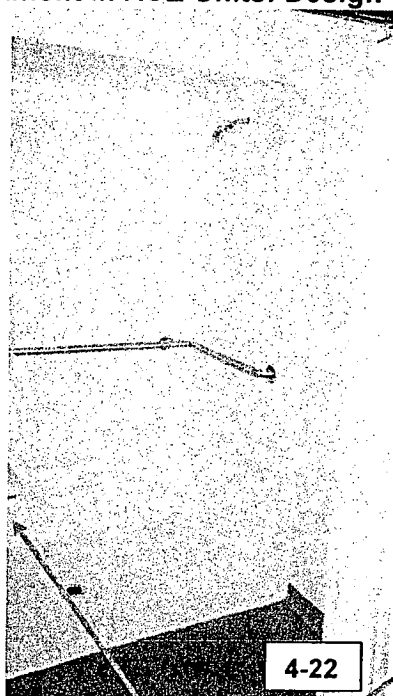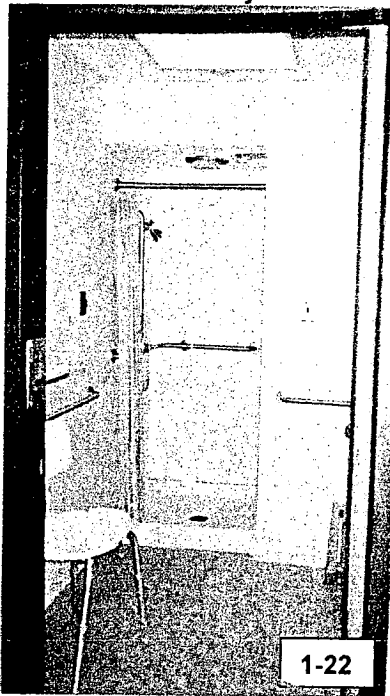
11-16

1-22, 4-22, 11-16
- Sturdy chairs to assist patients with showering

4-21
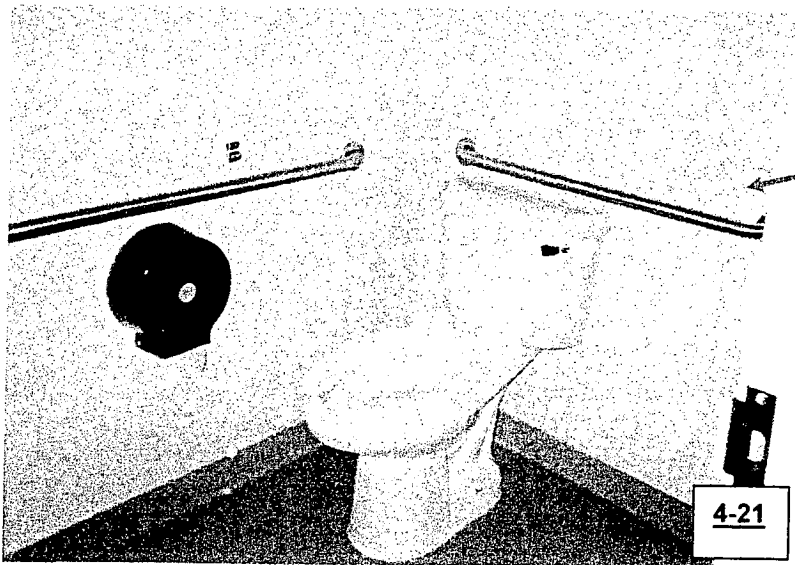
4-21
- All common bathing/shower areas have grab bars
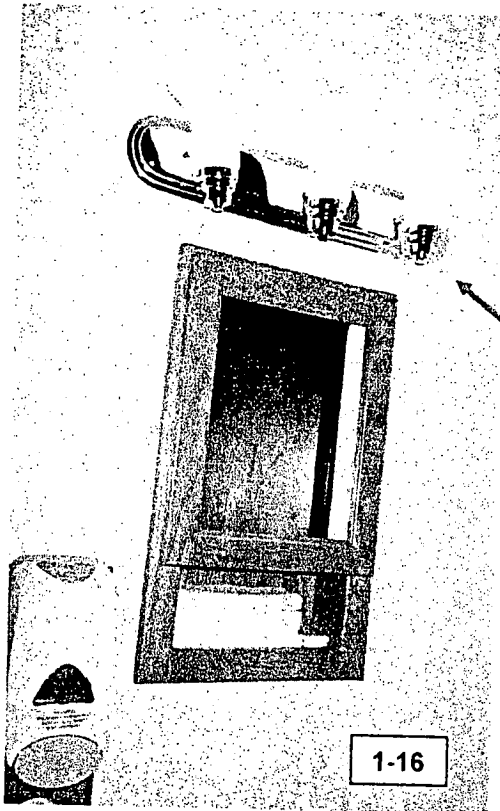
1-15, 1-16
- Non-institutional fixtures.

1-16

1-15
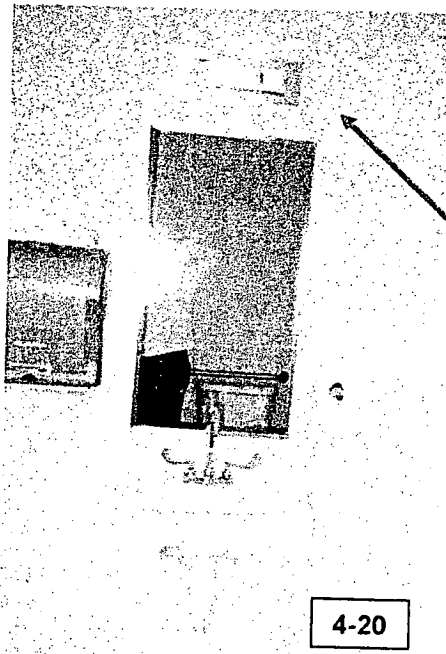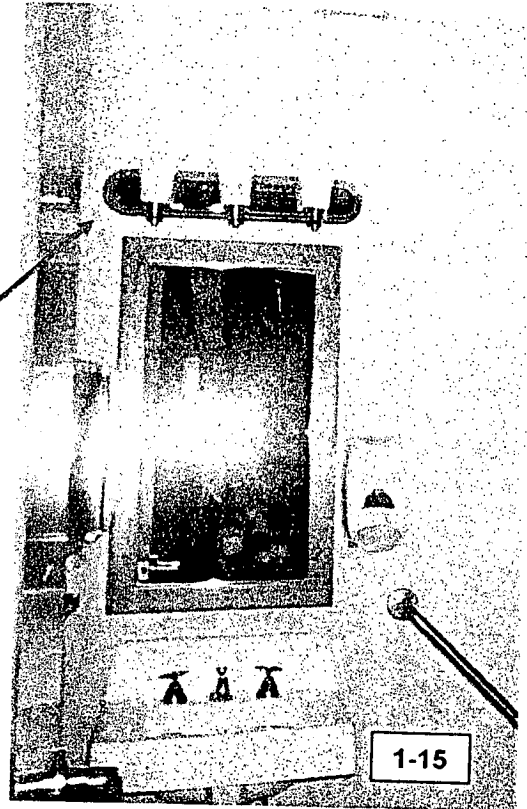
4-20
- Rated as effective but highly institutional lighting

4-20

The Physical Environment in ACE Units: Design Specifics and Staff Ratings
Study 1 Report

Flooring

Five of the eight units reported having and recommended carpeting in hallways giving as reasons decreasing glare, noise and slipping as well as making the environment more home-like and friendly. The other three units did not report what type of flooring they had in the hallways. Of those with carpet, 3 rated it 5 for elder friendliness, ratings for safety were mainly 5s, maintenance and durability ratings ranged from 3-5. (See photos GG-4, 1-24; 4-10)

Four of the eight units reported the use of carpet for noise reduction, a further two units have carpet and presumably benefit from a reduction in noise as well. Two units do not have anything in place to reduce noise

Furniture

The "gold standard" unit has conversation nooks off the hallway that contain two high back chairs and a table (see Photo 1-24). Another unit report having high-back chairs with footrests in the hallway.

Lighting

Home-like wall sconces are found in the conversation nooks in the hallway of the "gold standard" unit.

Wall treatments

Three units have both wallpaper and paint in their hallways, two have paper only and one has paint only. Two units did not respond to this question. In the unit that has paint only, the respondent commented that "...we have neutral paint colour on the wall. Walls get banged and dented from stretchers". Two of the units with wallpaper comment that wallpaper is easier to keep clean (see photo 4-10). Three of the units reported having pictures or items such as framed quilts and noted that these add to the ambience of the unit, one unit cautioned that "... reflections may increase delirium".

Handrails

Seven of the eight units report having handrails in their hallways. Four units give their handrails a 5 rating for elder friendliness; one gives a rating of 4 and one a rating of only 3. The latter unit also gave only a 3 rating for safety, maintenance and durability (see photos 1-11 and 4-10 and 11-22).

Orientation/wayfinding

Three units report using pattern variation in their carpeting as an aid to orientation/wayfinding. It was noted by the unit with conversation alcoves that these help with orientation. Four units specifically noted that paintings/wall decoration enhance orientation

Hallways and Entrance

1-25
- 2 of 3 Units with wander alert systems specified the use of "Wanderguard"

1-25
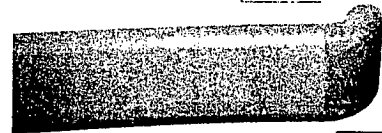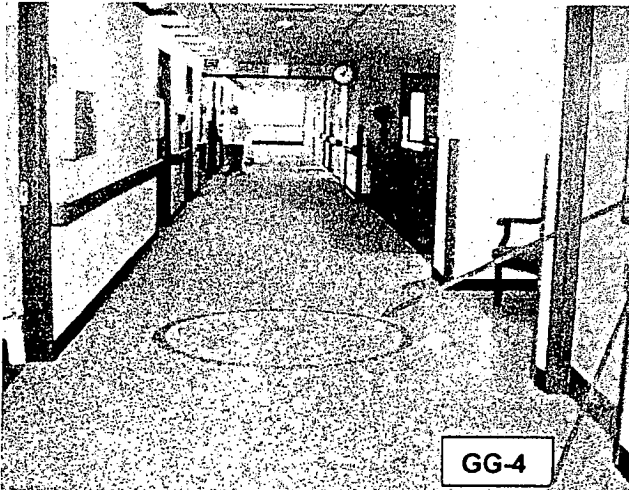
GG-4, 1-24, 4-10
- 5 Units report having carpeting in the hallways. It was rated "Elder-Friendly", reduces noise and can be used to aid orientation/wayfinding
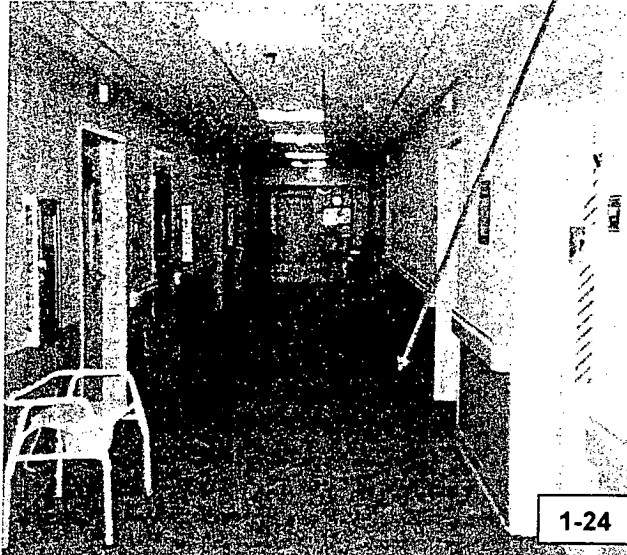
1-24
- Conversation alcove off hallway

GG-4

1-24

4-10
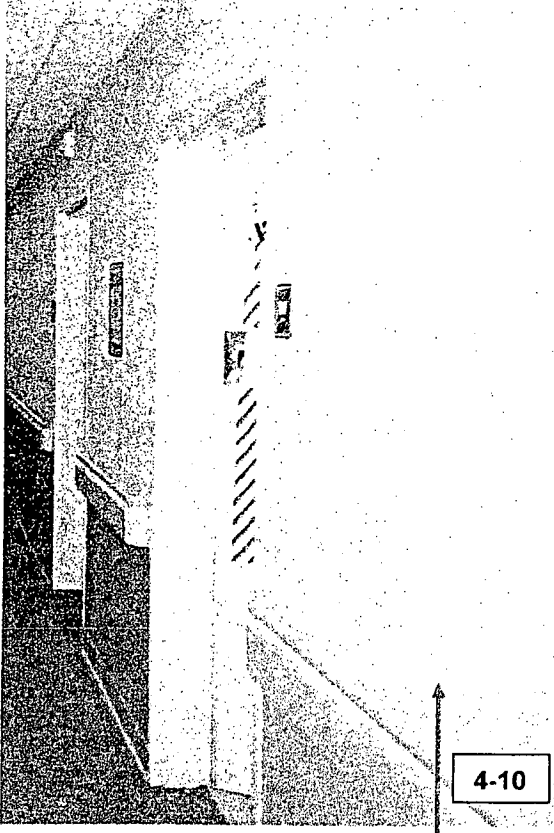
4-10

11-22

1-11, 4-10,11-22
- 5 units have at least partially wallpapered hallways
- 7 Units report handrails in the hallways. They are rated from 3 to 5 for Elder-Friendliness. These 3 Units all rated the handrails a '5'
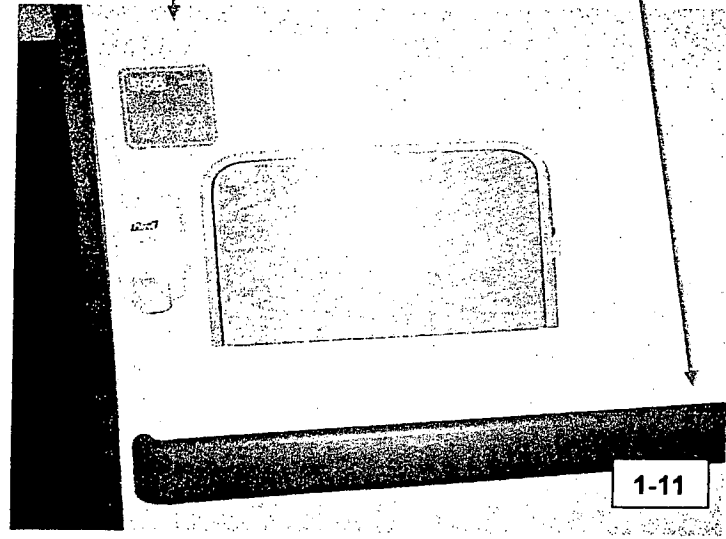
1-11

Lounge/Dining Area

Alarm system

At least two units have pull cord alarms in the patient lounge/dining area. The "gold standard" unit has three alarm systems in its lounge area: Wanderguard, pull cord and cameras. So far as we are aware, this is the only area in which cameras are employed. It is interesting to note that when asked what else they would recommend, another unit mentioned that cameras be set up for wandering patients or high-risk-for-falls patients. However, these would serve as an alarm system only if the camera could be programmed to alert staff in the event of elopement or a fall (i.e. using wireless sensors in combination with artificial intelligence such as used in "cognitive orthotics" this might in fact be possible).

Flooring

Four of the seven units that have a lounge report having carpeting, one has wood laminate floors, one has tile and the one does not indicate flooring type. Two of the four with carpet gave it a 5 out of 5 rating for elder friendliness, one gave it a 5 and the other a 4 for safety; but ratings for maintenance and durability were lower (one gave it a 4 while the other gave it a 3 rating). The flooring that received the highest performance rating all around (a 5 in all areas) was the one using a non-skid and non-glare wood laminate.

When asked if they had found any pattern of fabrics or flooring to be a problem for patients (e.g. distracting, disturbing, influence movement) only two responses were forthcoming. One noted that floral and busy patterns were problematic. The other comment concerned a coating on the floor. One unit had to change the coating on their new flooring to a non-skid, non-glare coating. After doing this they noted a reduction in patient falls.

Furniture

Of the six units that have a lounge/dining area, two gave their seating full marks (a 5 rating) for elder friendliness citing home-like appearance, arms on chairs and appropriate (18 inch) seat height. Seats that are too low and chairs without arms led two other units to assign a rating of only 2 for elder friendliness to seating in their lounge (see photos GG-2, GG-3; 11-21; 4-25).

HVAC

Five units report that they use deodorizers (e.g. aromatherapy, commercial products) to control odor.

Other

Three units reported that acoustical tiles are used to reduce noise levels. Six of the seven units with patient lounges have seating with exterior views.

Lounge/Dining Area

GG-2

GG-3

11-21

4-25
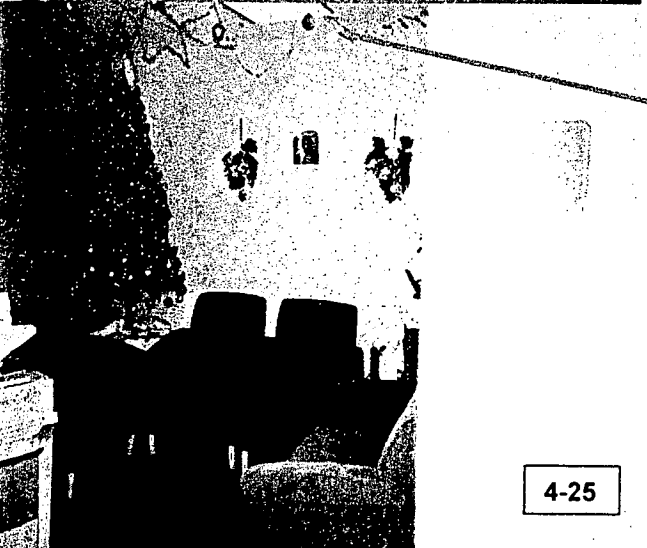
GG-2, GG-3
- One Unit has multiple lounge areas including a dining area
- Only this Unit and one other rated seating a '5' for Elder-Friendliness, citing home-like appearance, arms on chairs and appropriate seat height

11-21
- This unit rated seating a '4' for Elder-Friendliness, while the seats have arms and have straight backs; they lack a home-like appearance.

4-25
- Only this unit reported no windows or view from the patient lounge. It's only light source is artificial.

Summary and Conclusions

This report presents data from 8 ACE units in the USA. The purpose in conducting the study was to learn from these units about elements of the physical environment that they had modified in becoming an ACE unit and, those that they had found to be elder friendly and elder unfriendly. We had hoped to gather detailed and specific information about furnishing and fixtures; unfortunately, that was not forthcoming in large amounts. One reason was because of the length of time required to complete our survey. A second reason was that in the older ACE units this information was not readily available to current staff. However, much useful data was gathered – especially via the photos sent by three of the units. These filled in gaps in their written information. The information provided by the surveys and photos will contribute important information for the design of the "ideal" unit in Study 3. In particular, the information about carpeting in patient rooms will be fundamental to our flooring choice. Based on what we learned, we will not install carpet. Rather, we will seek a material that like carpet, is soft, non-glare and non-skid -- that will serve to prevent trips and falls and minimize injury, reduce noise and provide a less institutional décor – but at the same time, be easily maintained and durable. The data has also presented us with information about more elder friendly beds than were found in FHA – specifically the Advanta bed which includes an exit alarm and night light as well as having a pressure reduction mattress and easily manipulated height adjustment that goes sufficiently low to meet the needs of small patients. Examples of lighting fixtures that were both effective in terms of the amount and colour of light provided as well as attractive were also in this data set. The study, in other words, was well worth the effort even though we only able to gain responses from 8 of the 21 potentially eligible ACE units. With seven surveys still outstanding it is possible that more data will be forthcoming – if so, the new information will be incorporated into the design of Study 3.

References

Gutman, G. (2005, January). *Critical elements of the physical features of an elderly friendly acute hospital environment.* A literature review undertaken for The Physical Environment Task Group, Fraser Health Acute Geriatric Clinical Services Planning and Delivery Team.

Gutman, G., Sarte, A., Parke, B. & Friesen, K. (2005, December). *Study 2: The elder friendliness of the physical environment of medical and surgical units in the Fraser Health Authority.* Final report submitted to Fraser Health Geriatric Clinical Service Planning and Delivery Team

Landefeld, C.S. (2003). Improving health care of older persons. *Annals of Internal Medicine,* 139 (5 – Part 2), 421-424.

Palmer, R., Counsell, S., & Landefeld, C. (1998). Clinical intervention trials: the ACE unit. *Clinical Geriatric Medicine, 14,* 831-849.

Ulrich, R., Quan, X., Zimring, C., Joseph, A., & Choudhary, R. (2004) *The role of the physical environment in the hospital of the 21st century: A once-in-a-lifetime opportunity.* [Web Page]. URL http://www.healthdesign.org./research/reports/physical_environ.php [2004, December 6].

APPENDIX 1: SFU REQUEST FOR ETHICS APPROVAL AND ETHICS CERTIFICATE

SIMON FRASER UNIVERSITY

OFFICE OF RESEARCH ETHICS
STRAND HALL ROOM 2104

BURNABY, BRITISH COLUMBIA
CANADA V5A 1S6
Telephone: 604-291-3447
FAX: 604-268-6785

August 11, 2005

Dr. Gloria Gutman
Gerontology Program
Simon Fraser University

Dear Dr. Gutman:

Re: Towards more Elder-Friendly Acute Hospitals – Study 1:
The Physical Environment in ACE Units: Design Specifics and Staff Ratings - Ref. #36926
Fraser Health and Residential Care Services

I am pleased to inform you that the above referenced Request for Ethical Approval of Research has been approved on behalf of the Research Ethics Board. The approval for this project is for the term of the period of the grant, or the term of your appointment at SFU, whichever comes first. If this project does not receive grant support, the term of approval is until August 11, 2009. Any changes in the procedures affecting interaction with human subjects should be reported to the Research Ethics Board. Significant changes will require the submission of a revised Request for Ethical Approval of Research.

Your application has been categorized as "minimal risk" and approved by the Director, Office of Research Ethics, on behalf of the Research Ethics Board in accordance with University policy R20.01, http://www.sfu.ca/policies/research/r20-01.htm. The Board reviews and may amend decisions or subsequent amendments made independently by the Director, Chair or Deputy Chair at its regular monthly meetings.

"Minimal risk" occurs when potential subjects can reasonably be expected to regard the probability and magnitude of possible harms incurred by participating in the research to be no greater than those encountered by the subject in those aspects of his or her everyday life that relate to the research.
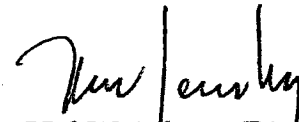
Page 2

Please note that it is the responsibility of the researcher, or the responsibility of the Student Supervisor if the researcher is a graduate student or undergraduate student, to maintain written or other forms of documented consent for a period of 1 year after the research has been completed.

Best wishes for success in this research.

Sincerely,

Dr. Hal Weinberg, Director
Office of Research Ethics

c: Teena Love, Co-Investigator

/jmy

SIMON FRASER UNIVERSITY

REQUEST FOR ETHICAL APPROVAL OF RESEARCH- Form 1

1. Investigator Information

Investigator Name: **Gloria Gutman**

Title of Research: **Towards more Elder-Friendly Acute Hospitals - Study 1: The Physical Environment of ACE Units: Design Specifics and Staff Ratings.**

Investigator Department: **Gerontology**

Investigator Department Chair or Director: **Andrew Wister**

Investigator SFU Email: **gutman@sfu.ca**

Investigator Work Phone: **604-291-5063**

Investigator Home Phone: **605-263-5221**

Investigator Fax: **604-291-5066**

Investigator Mobile Phone: **604-767-2009**

Investigator Position: **Faculty**

Investigator Position if SFU Faculty: **Professor**

Investigator Position if Staff or Other: ·

SFU Co-investigators or Collaborators who **Teena Love** (Note: Persons who are not SFU faculty, staff or student must are governed by the terms of this approval: acquire ethics approval from the institution that employs them)

Co-Investigator Email(s): **tmlove@sfu.ca**

---

2. Supervisor information for Student or Staff applications. Note that Students, Post Doctoral Researchers, Adjunct or Visiting Faculty must have a SFU Faculty Supervisor. Supervisors of Graduate and Undergraduate students are automatically co-applicants of applications. Regular Faculty at SFU should leave this blank.

Faculty Supervisor Surname: **n/a**

Faculty Supervisor First Name:

Faculty Supervisor SFU Email:

Faculty Supervisor Department:

Faculty Supervisor Chair or Director:

---

3. Grant Information. Note: Grants include both external and SFU internal grants.

Has this research been submitted to a granting agency for review? **Yes**

Has this research been approved by a granting agency contingent on ethics approval? **Yes**

Has this grant been reviewed by any other agency? **Yes**

If YES Title of Grant **Towards More Elder Friendly Acute Hospitals: A Program of Research Focused on the Physical Environment of Hospitals in the Fraser Health Authority.**

Granting Agency: **Fraser Health and Residential Care Services**

Grant Number: **6855**

Granting Agency Program (if applicable):

Date Granting Agency proposals or approvals begins (use format MM/DD/YYYY) : **04/01/2005**

Date Grant Ends: **03/31/2006**

Note: If documents are to follow complete **Form 6**.

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4. Research Study Information

1.Country and location where procedures will be carried out:
Acute Care for Elders (ACE) Units in the USA (e.g., CT, DE, GA, ME, MI, MO, NJ, NY, OH, OK, PA, TX, WI) & Canada (if existing).

2. Dates of procedures:
August to December 2005

3. Copies of the results of this study upon its completion may be obtained by contacting:
Dr. Gloria Gutman Gerontology Research Centre Simon Fraser University at Harbour Centre Suite 2800, 515 W. Hastings Street Vancouver BC V6B 5K3

4. Does the research study as described above expose the participants to any risk of physical stress or physical harm? **No**

> If yes a Medical Release form to be signed by both the participant and his / her physician must be used.
>
> If yes a Participant Consent Form must be used that identifies the risks and a copy of the research study protocol must be attached to the application (see Form #2 and #5)

5. Does the research study as described above expose the participants to any risk of psychological stress? **No**

> If yes a Participant Consent Form must be used that identifies the risks and a copy of the research study protocol must be attached to the application (see Form #2 and #5)

6. Will any part of the research study be supervised or undertaken by graduate students or undergraduate students? **Yes**

> Note: If the investigator is a graduate or undergraduate student, this should be answered yes. Students are not protected under Section 68 of the Universities Act, nor do they enjoy full protection under Simon Fraser University's liability insurance policies.

7. Will Children be involved as participants in your research? If YES please check. **No**

> Method of obtaining Informed Consent From Children:

7a. If children are used will you be using Consent Form 3 and include as information to parents or guardians Form 5 as the information document?

> If not explain the procedure used for obtaining parental or guardian consent:

8a. Who are the participants (subjects) in this research study?
Participants will be administrators and/or staff of Acute Care for Elders (ACE) units.

8b. What will the participants be required to do?
Participants will be requested to complete a questionnaire designed to provide information on the physical design components of their ACE unit and to rate the performance (e.g., durability, ease and cost of maintenance) and Elder-Friendliness of various components of the physical environmental of their ACE unit. In addition, participants will be invited to make recommendations for additional structural and interior design adaptations that may further improve the physical environment of their unit, or those being constructed by others. Follow-up phone calls will be made if additional details are required, to obtain missing information or for clarification of answers.

8c. How will the participants be recruited?
A formal letter of invitation will be sent to the Directors of eligible ACE units.

9. Have you contacted an agency, a school, school district, company or First Nation Band for approval of the participation of their employees or members in your study? If this is not applicable, say why. **No**

> If Yes please indicate if you have received approval.
> If No, you must include the reason why permission was not sought.
> **Not applicable. Director (or their designate) will be the respondent.**

10. Will you be asking your participants to participate in a research study involving completion of an interview,

questionnaire, survey or a similar instrument? **Yes**

> If yes please submit a hard copy or email attachment of the instrument and describe below the nature of the survey and the types of information the survey is intended to access. Include information about how you will secure informed consent of your participants.
> **Questionnaire and phone follow-up are intended to obtain information from the directors and/or designated staff of existing ACE units in the U.S. and Canada on (1) the physical space/environmental design; 2) performance assessments and their opinion of elder friendliness of various physical environmental components in their ACE unit; and (3) further recommendations that would improve the unit. Information letter and informed consent form will be faxed to each potential participants with a request to sign and fax back.**

11. Will you be asking your participants to participate in a research study other than one involving completion of an interview, questionnaire, survey, or similar instrument? **No**

> If Yes please explain briefly the nature of participation. Note: Appending a lengthy thesis proposal or other document does not substitute for completion of this section.

12. Will this study use the internet (web or email) to survey or gather information from participants? **No**

> If yes, please answer the following 3 questions: 1) How will respondents give informed consent? (e.g., by being given a username and password after having signed a written consent form; clicking on a link at the bottom of an online consent form; or assuming consent because the answers are submitted voluntarily).
>
> 2) How will the names and email addresses of the respondents be collected? If from a list or directory, do you have the permission of the owner(s) to use the names for this purpose?
>
> 3) How will data be communicated between respondent and researcher (e.g email; third party secure web site; non-secure web site or ?) and how will duplicate responses from single users be avoided?

13. Is it reasonably possible that the observations made in this study will include information that is subject to mandatory reporting (e.g., Child Abuse)? NOTE: IF YES CONSENT FORM 2 (a) MUST BE USED. **No**

> If yes please describe the nature of the study, what information may be subject to mandatory reporting and what harms may be uncovered.

14. Does the research study as described above expose the participants to any risk of harm from electrical or mechanical devices? **No**

> If yes the investigator must include documents that affirm that the apparatus has been subjected to all appropriate safety tests and that the apparatus will be operated by a suitably trained person.

15. Does the study involve human tissue, including blood? **No**

> If yes please provide evidence of Biosafety Certification from the institution(s) where the research will take place. Describe the Certification and include relevant documents.

16. Will a third party be responsible for distributing and receiving the data, e.g., distribution and collection by a company or agency? **No**

> If yes please describe the agreements with the third party to guarantee confidentiality and anonymity.

17. Will the data collected from each participant be kept confidential? **Yes**

> If no, please explain. You will also need to choose option "C" or "D" in form 2.

18. Does your data involve the use of secondary data (information that has been previously collected including in databases)?
iii) Only human participants

If i or ii, please describe the source of the secondary data.

19. Will any raw data gathered under this protocol be stored, processed or revealed outside of Canada (including electronically, such as data storage)? **No**

If yes, then in what location?

Printed Thu, Jan 12, 2006

APPENDIX 2: INVITATION TO UNIT MANAGERS TO PARTICIPATE IN THE STUDY

SIMON FRASER UNIVERSITY AT HARBOUR CENTRE

Gerontology Department
Gerontology Research Centre
515 West Hastings Street, Suite #2800
Vancouver, British Columbia
Canada V6B 5K3
Tel: (604) 291-5062
Fax: (604) 291-5066

E-mail: gutman@sfu.ca
http://www.harbour.sfu.ca/gero/

Date

Addressee

Further to our phone conversation, I am writing to invite you to participate in a study of the physical environment of Acute Care for the Elderly (ACE) units. Current literature provides considerable information about care-related practices, interdisciplinary team rounds and discharge planning, and medical care reviews, but has relatively little to say regarding the physical environment.

The study is part of a larger project being undertaken for the Fraser Health Authority (FHA) in British Columbia, Canada which is concerned about making their 12 hospitals more Elder-Friendly. Sharing your experience and opinion will benefit the FHA while helping to develop a database that will be of great value to hospitals world-wide. We also hope that participating will yield information relevant to improving your own ACE unit.

The survey we are asking you to complete is comprehensive and may require input from other departments (e.g. housekeeping, maintenance, purchasing). You may consult with others or, if you prefer, delegate sections. The majority of questions are presented as "fill-in-the-blanks" to make the process as quick and easy as possible. If needed, a short follow-up phone call may occur to clarify answers.

The project's Principle Investigator is Dr. Gloria Gutman, Professor in the Department of Gerontology and Director of the Gerontology Research Centre at Simon Fraser University in Vancouver, British Columbia and Immediate Past President of the International Association of Gerontology. As a Masters candidate in the Gerontology Department at Simon Fraser University, I will also be using the data as the basis of my Masters thesis.

Your hospital was identified in an internet search using the key words, "Acute Care for the Elderly and ACE Unit". I will contact you within a week to confirm receipt of this letter and survey and to answer any questions you may have.

Attached is a list of the ACE units that we are contacting. I would be grateful if you would advise me of any other units that should be contacted.

Sincerely,

Gloria Gutman
Professor,
Department of Gerontology
Simon Fraser University

Teena Love
MA Candidate,
Department of Gerontology
Simon Fraser University

Name of Hospital	Address
Greenwich Hospital	5 Perryridge Rd. Greenwich, CT 06830
Yale New Haven Hospital	20 York St. New Haven, CT 06510
Christiana Hospital	4755 Ogletown-Stanton Rd. (Rte. 4) Newark, DE 19718
Florida Hospital-Orlando	601 E. Rollins Ave, Orlando FL 32806
DeKalb Medical Center	2701 N. Decatur Rd. Decatur, GA 30033
Wishard Memorial Hospital, Wishard Health Services and Methodist Hospital, Clarian Health Partners	Indiana University School of Medicine 1001 West 10th Street, OPW-M200 Indianapolis, Indiana 46202 (address of Dr. Sennour)
Wesley Medical Center	550 North Hillside Wichita Kansas 67214-4914-4976
Maine Medical Center	22 Bramhall St. Portland, ME 04102
Detroit Receiving Hospital and University Health Center	4201 St. Antoine Blvd. Detroit, MI 48201
Spectrum Health Hospital	100 Michigan Ave NE Grand Rapids, MI 49503
Des Peres Hospital	2345 Dougherty Ferry Rd. St. Louis
Barnes-Jewish Hospital	One Barnes-Jewish Hospital Plaza
Saint Louis University Hospital	3635 Vista Ave. at Grand Boulevard. PO Box 15250 St. Louis
Virtua West Jersey Hospital, Berlin	100 Townsend Ave. Berlin
Highland Hospital (Strong Health)	1000 South Ave. Rochester
Brookdale Department of Geriatrics and Adult Development, Mount Sinai Hospital	One Gustave L. LevyPlace
New York-Presbyterian Hospital	525 E. 68th St. New York
Buffalo General Hospital	100 High Street Buffalo
Maimonides Medical Center	4802 10th Ave. Kronish
North Shore University Hospital	300 Community Drive Manhasset
St. Vincent's Hospital Manhattan	170 W. 12th St. New York
Summa Health System	Contact information: Akron City Hospital ACE Unit 525 E. Market St. Akron
University Hospitals of Cleveland	11100 Euclid Ave. Cleveland
The Donald W. Reynolds Department of Geriatrics at The University of Oklahoma Health Sciences Center	Donald W. Reynolds Department of Geriatric Medicine PO Box 26901
Moses Taylor Hospital	Scranton
Presbyterian Medical Center of University of Pennsylvania Health System	Scheie Eye Centre
Warminster Hospital	225 Newtown Rd. Warminster
John Sealy Hospital (University of Texas Medical Branch)	301 University Blvd. Galveston
Longview Regional Medical Center	P.O. Box 14000 Longview
Virginia Mason Medical Center	925 Seneca St. H8-32 Seattle
Aurora Sinai Medical Center	945 N. 12th St. Milwaukee
Aurora St. Lukes South Shore (was Trinity Memorial Hosp; now southside campus Aurora St. Luke's Medical Centre)	5900 South Lake Dr. Cudahy

Form 2- Informed Consent By Participants In a Research Study

The University and those conducting this research study subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of participants. This research is being conducted under permission of the Simon Fraser Research Ethics Board. The chief concern of the Board is for the health, safety and psychological well-being of research participants.

Should you wish to obtain information about your rights as a participant in research, or about the responsibilities of researchers, or if you have any questions, concerns or complaints about the manner in which you were treated in this study, please contact the Director, Office of Research Ethics by email at hweinber@sfu.ca or phone at 604-268-6593.

Your signature on this form will signify that you have received a document which describes the procedures, possible risks, and benefits of this research study, that you have received an adequate opportunity to consider the information in the documents describing the study, and that you voluntarily agree to participate in the study.

Any information that is obtained during this study will be kept confidential to the full extent permitted by professional ethics. Knowledge of your identity is for the sole purpose of contacting you in the case of missing data or where clarification is required. Information concerning your identity will be removed upon completion of data collection. Materials will be maintained in a secure location. Any specific Professional Ethics that are used are described in the study information document (Form 5).

Title: **Towards more Elder-Friendly Acute Hospitals - Study 1: The Physical Environment of ACE Units: Design Specifics and Staff Ratings.**
Investigator Name: **Gloria Gutman**
Investigator Department: **Gerontology**

Having been asked to participate in the research study named above, I certify that I have read the procedures specified in the Study Information Document describing the study. I understand the procedures to be used in this study and the personal risks to me in taking part in the study as described below:

Risks to the participant, third parties or society:
None.

Benefits of study to the development of new knowledge:
In a recent literature review that identified the critical elements of the physical features of an elderly friendly acute hospital environment (Gutman, 2005), it was determined that there is a paucity of research examining how the physical design of acute care hospitals impact care delivery and illness recovery and satisfaction

of elderly patients. Indeed, while there is considerable literature on Environment and Aging, the focus has primarily been on the design of residential living environments and long term care facilities. Given the substantial number of older adults that currently make up the inpatient population of hospitals, the prevalence of accidents and loss of function during hospital stays, (beyond what is expected from their admitting diagnosis), it is important to further develop this area of research. This study serves as an initial step towards improving the Elder Friendliness of general medical-surgical units.

Procedures:
Participants will be requested to complete a questionnaire designed to provide information on the physical design components of their ACE unit and to rate the performance (e.g., durability, ease and cost of maintenance) and Elder-Friendliness of various components of the physical environmental of their ACE unit. In addition, participants will be invited to make recommendations for additional structural and interior design adaptations that may further improve the physical environment of their unit, or those being constructed by others. Follow-up phone calls will be made if additional details are required, to obtain missing information or for clarification of answers.

I understand that I may withdraw my participation at any time. I also understand that I may register
any complaint with the Director of the Office of Research Ethics or the researcher named above
or with the Chair, Director or Dean of the Department, School or Faculty as shown below.

Department, School or Faculty: Chair, Director or Dean:

8888 University Way,
Simon Fraser University,
Burnaby, British Columbia, V5A 1S6, Canada

I may obtain copies of the results of this study, upon its completion by contacting:
Dr. Gloria Gutman
Gerontology Research Centre
Simon Fraser University at Harbour Centre
Suite 2800, 515 W. Hastings Street
Vancouver BC V6B 5K3

I have been informed that the research will be confidential.

I understand that my supervisor or employer may require me to obtain his or her permission prior to my participation in a study of this kind.

I understand the risks and contributions of my participation in this study and agree to participate:

The participant and witness shall fill in this area. Please print legibly

Participant Last Name: Participant First Name:

Participant Contact Information:

Participant Signature: Witness (if required by the Office of Research Ethics):

Date (use format MM/DD/YYYY):

APPENDIX 3: SURVEY INSTRUMENT

Gerontology Research Centre
Simon Fraser University
ACE Unit Survey

Name of Hospital: _____

Date: _____

Person(s) Completing this Survey _____

_____

_____

_____

> Introduction: The purpose of this questionnaire is to develop a detailed picture of the physical environment of your Acute Care for the Elderly (ACE) unit and to learn, based on your experience, which design components are most suitable for future units that may be established.
>
> As part of the assessment you will be asked to rate environmental components as being (or not being) "Elder-Friendly". For this study, "Elder-Friendly" is defined as being considerate of the special safety, physical, social and psychological needs of persons aged 65 and older. For example, "Elder-Friendly" components of a lounge/dining area would include chairs that have arm rests (making sitting and rising easier), furnishings and interior decoration in colours from the red-orange end of the spectrum (easier for older eyes to discriminate between) and/or that maximize figure/ground contrast, and window treatments that reduce glare.
>
> For maximum impact, we need specifics (e.g. manufacturer, model/stock #, colour, cost etc.). To gather the detailed information asked for, we realize that individuals in other departments may need to be consulted (e.g. housekeeping, maintenance, purchasing). Please feel free to include other people, or to delegate sections, in order to complete this questionnaire. If more space is needed, use a separate piece of paper and clearly indicate the questions being addressed.
>
> If you have any questions please feel free to contact Teena Love at tmlove@sfu.ca . Teena is a Masters candidate in the Gerontology Department at Simon Fraser University in Vancouver, Canada. Her senior supervisor and the Principal Investigator for this project is Dr. Gloria Gutman (Gutman@sfu.ca). The project is funded in part by the Fraser Health Authority (FHA). The co-investigator from FHA is Belinda Parke, Clinical Nurse Specialist.

1. What year was your ACE unit opened: _____

2. Was your ACE unit: Renovated from an existing unit _____ or Purpose-built _____?

3. Your ACE unit currently includes (check all that apply):
   _____ A "prepared" environment (i.e. fosters independent function)   _____ A focus on patient-centred care
   _____ Interdisciplinary team rounds and discharge planning   _____ "Medical care review" (i.e. Use of medical guidelines specific to the needs of the elderly, the goal to avoid iatrogenic effects)

   _____ Specific admission criteria, please explain

Physical Environment:

4. How many patient rooms does your ACE unit have?
   _____ Single-bed   _____ Double-bed   _____ Three-bed   _____ Four-bed   _____ Other

5. What is the total square footage of your ACE unit? _____
6. How many nursing stations do you have? _____

7. Which of the following diagrams best reflects the layout of your ACE unit?

☐ Triangle
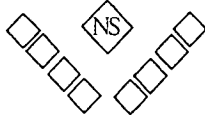
☐ Staggered
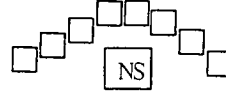
☐ Circular
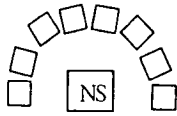
☐ Double loaded or front and back
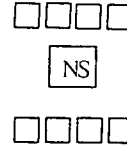
☐ Linear
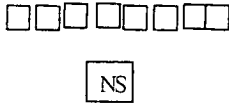
☐ Horseshoe
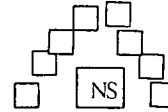
☐ Box
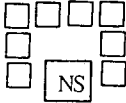
☐ Other, please explain or draw below
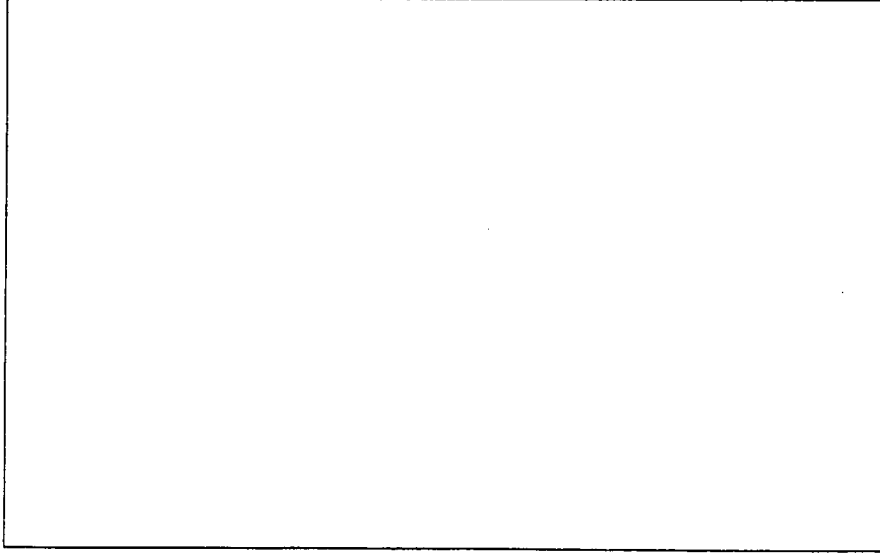
8. Other than patient rooms, which of the areas in the chart below are present in your ACE unit? If you were advising another hospital, which would you recommend be included in an ACE unit and why?

Room Type	Have (Y/N)	Would Recommend (Y/N)	Why/Why Not?
One central nurses' station			
Multiple nurses' stations			
Therapy rooms, specify type			
Examination room			
Interdisciplinary office			
Lounge visitors/patients			
Separate staff lounge			
Dining area			
Meeting/conference room			
"Conversation Nooks" or alcove seating in corridor			
Other (e.g. delirium room), specify			
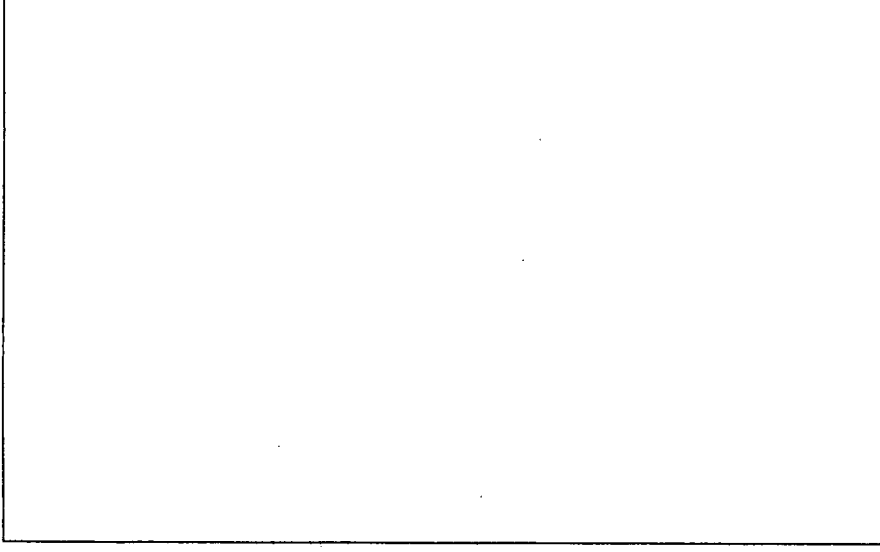
9. Where are the patient toilet and bathing facilities in your ACE unit located (check all that apply)?

____ Toilet in patient room (i.e. "en-suite")   ____ Toilet adjacent to lounge   ____ Shower in patient room

____ Shared toilet between two rooms   ____ Toilet off corridor   ____ Shower/bathtub off corridor (i.e. "tub room")

____ Other, please specify

10. In the boxes below, please sketch (or send a photo) showing the layout/floor plan of a typical bathing room, en-suite patient toilet (i.e. "restroom"), and patient bedroom in your ACE unit. Please include measurements if available.
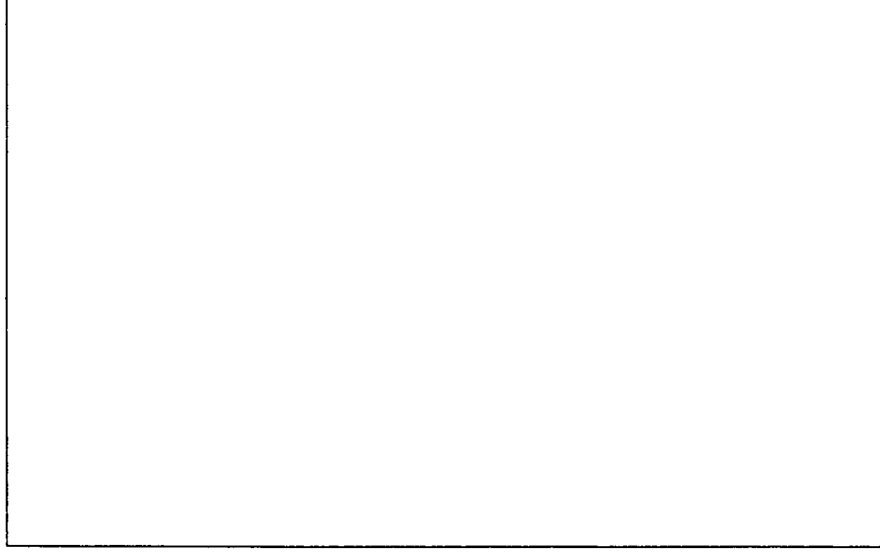
Bathing Room: Patient Toilet (restroom):   Patient Bedroom

11. Please rate each of these layouts from 1(poor) to 5(Excellent) for Elder-Friendliness, For example, in rating the toilet (restroom) a '5' would mean that you consider the layout to be ideal in terms of friendliness to older patients.

	Bathing room	Patient toilet (restroom)	Patient Bedroom
Elder-Friendliness			

12. Do you have any suggestions that would improve the Elder Friendliness of the layout of the patient toilet (restroom), please explain reason for suggestion?

13. Do you have any suggestions that would improve the Elder Friendliness of the layout of the bathing room, please explain reason for suggestion?

14. Do you have any suggestions that would improve the Elder Friendliness of the layout of the patient bedroom, please explain reason for suggestion?

15. The following charts are designed to obtain details about your ACE unit toilet and bathing areas, patient bedrooms, lounge/dining areas and hallways. Rate each interior design component for Elder-Friendliness (1=poor, 5= Excellent), indicate if you would recommend it to another hospital and why/why not? Next, could you or your designate please provide performance ratings for safety, maintenance, and durability (1 = poor, 5 = Excellent) and under "product specifics" write in the name of the manufacturer, model, colour and cost.

Patient Toilet Area

Interior Design Component	Elder-Friendly (1-5)	Recommend (Why/Not?) (Y/N)	Performance Rating (1=poor, 5=Excellent)			Product Specifics (manufacturer, model, colour and cost)
			Safety (e.g. infection control, trips, falls, ease for walkers/canes)	Maintenance (e.g. ease of cleaning, repair)	Durability (e.g. tearing and fading)	
Alarm System						
Fixtures (toilet/sink/ shower/tub)						
Flooring						
Furniture						
Grab bars						
Heating, ventilation, air-condit. (HVAC)						
Lighting						
Wall treatment (tile, paint, wallpaper)						
Window Covering						

Bathing Area

Interior Design Component	Elder-Friendly (1-5)	Recommend (Why/Not?) (Y/N)	Performance Rating (1=poor, 5=Excellent)			Product Specifics (manufacturer, model, colour and cost)
			Safety (e.g. infection control, trips, falls, ease for walkers/canes)	Maintenance (e.g. ease of cleaning, repair)	Durability (e.g. tearing and fading)	
Alarm System						
Fixtures (toilet/sink/ shower/tub)						
Flooring						
Furniture						
Grab bars						
HVAC						
Lighting						
Wall treatment (tile, paint, wallpaper)						
Window Covering						

Patient Bedroom

Interior Design Component	Elder-Friendly (1-5)	Recommend (Why/Not?) (Y/N)	Performance Rating (1=poor, 5=Excellent)			Product Specifics (manufacturer, model, colour and cost)
			Safety (e.g. infection control, trips, falls, ease for walkers/canes)	Maintenance (e.g. ease of cleaning, repair)	Durability (e.g. tearing and fading)	
Alarm System						
Flooring						
Furniture: Bed						
Seating						
Tables						
Dresser						
Nightstand						
Other, specify						
HVAC						

Patient Bedroom

Interior Design Component	Elder-Friendly (1-5)	Recommend (Why/Not?) (Y/N)	Performance Rating (1=poor, 5=Excellent)			Product Specifics (manufacturer, model, colour and cost)
			Safety (e.g. infection control, trips, falls, ease for walkers/canes)	Maintenance (e.g. ease of cleaning, repair)	Durability (e.g. tearing and fading)	
Lighting: Task Lighting						
Ambient						
Wall Treatment Paint						
Wallpaper						
Other, specify						
Window Coverings Blinds						
Curtains						
Other, specify						

Lounge/Dining Areas

Interior Design Component	Elder-Friendly (1-5)	Recommend (Why/Not?) (Y/N)	Performance Rating (1=poor, 5=Excellent)			Product Specifics (manufacturer, model, colour and cost)
			Safety (e.g. infection control, trips, falls, ease for walkers/canes)	Maintenance (e.g. ease of cleaning, repair)	Durability (e.g. tearing and fading)	
Alarm System						
Flooring						
Furniture: Seating						
Tables						
Other, specify						
Lighting Task lights						
Ambient						

Lounge/Dining Areas

Interior Design Component	Elder-Friendly (1-5)	Recommend (Why/Not?) (Y/N)	Performance Rating (1=poor, 5=Excellent)			Product Specifics (manufacturer, model, colour and cost)
			Safety (e.g. infection control, trips, falls, ease for walkers/canes)	Maintenance (e.g. ease of cleaning, repair)	Durability (e.g. tearing and fading)	
Wall Treatment: Paint						
Wallpaper						
Other, specify						
Window Coverings Blinds						
Curtains						
Other, specify						

Hallways

Interior Design Component	Elder-Friendly (1-5)	Recommend (Why/Not?) (Y/N)	Performance Rating (1=poor, 5=Excellent)			Product Specifics (manufacturer, model, colour and cost)
			Safety (e.g. infection control, trips, falls, ease for walkers/canes)	Maintenance (e.g. ease of cleaning, repair)	Durability (e.g. tearing and fading)	
Alarm System						
Flooring						
Furniture Seating						
Tables						
Other, specify						
Lighting Ambient						
Wall Sconces						
Other, specify						

Hallways

Interior Design Component	Elder-Friendly (1-5)	Recommend (Why/Not?) (Y/N)	Performance Rating (1=poor, 5=Excellent)			Product Specifics (manufacturer, model, colour and cost)
			Safety (e.g. infection control, trips, falls, ease for walkers/canes)	Maintenance (e.g. ease of cleaning, repair)	Durability (e.g. tearing and fading)	
Wall Treatment: Paint						
Wallpaper						
Other, specify						
Window Coverings Blinds						
Curtains						
Other, specify						
Hand Rails						

16. What cues to orientation and wayfinding are currently present in the unit? Rate each for Elder-Friendliness

Cues	Have (Y/N)	Elder-Friendly (1-5)	Describe
Colour-coding (e.g. walls, furniture, stripes)			
Floors (e.g. different surfaces, markings, colors, stripes)			
Landmarks, (e.g. paintings/wall-hangings)			
Sign & Symbols			

Floors

17. What are the predominant floor colour(s) of your ACE unit?
(List in descending order) _____   _____   _____

18. Have you found any pattern of fabrics or flooring to be a problem for patients? (e.g. distracting, disturbing, influence movement)
If so which, and what were the adverse outcomes (e.g. falls, disorientation)

19. Is there a colour contrast (e.g. coloured baseboards) between the floor and wall surfaces in your ACE unit?
_____ Yes _____ No

Furniture

20. Where do patients in your ACE unit put their personal belongings? (Check all that apply)
_____ Shelf in patient room _____ Closet _____ Display in lounge/dining area
_____ In/On night table _____ At doorway to room (i.e. memory box) _____ Other, please specify

21. In your ACE unit the furniture is: _____ Co-ordinated (i.e. part of planned design)

_____ A "mixed-bag" (i.e. furniture gathered from various sources)

Lighting

22. Is the total amount of lighting in patient areas ample for day and night?

Bedroom: _____ Yes _____ No

If no, please explain

Lounge/dining area: _____ Yes _____ No

If no, please explain

23. Do you utilize nightlights? _____ Yes _____ No

If yes, where and do you consider this lighting sufficient?

24. Please describe the natural light in your ACE unit, by filling-in the following chart.

Location	Window (Y/N)	Can view be seen from seated position? (Y/N)	How is Glare Controlled and is it Effective? (please explain)
Patient Rooms		Chair: Bed:	
Lounge/Dining Areas			
Hallways			

Privacy, Control and Security

25. Can patients themselves control the level of natural and artificial light in their room?

Natural light (windows) _____ Yes _____ No

If yes, how and is this method Elder-Friendly (e.g. controls within reach, easy to operate)?

Artificial light _____ Yes _____ No

If yes, how and is this method Elder-Friendly (e.g. controls within reach, easy to operate)?

26. Are patients themselves able to control the temperature in their rooms? _____ Yes _____ No
    If yes, how and is this method Elder-Friendly (e.g. controls within reach, easy to operate)?

27. Are patients themselves able to control the door to their room (e.g. open/close)? _____ Yes _____ No
    If yes, how and is this method Elder-Friendly (e.g. controls within reach, easy to operate)?

28. Does door size, weight or hardware pose barriers to patient movement? _____ Yes _____ No
    If yes, please explain

29. Do patients have a place where they can lock away personal possessions? _____ Yes _____ No
    If yes, where and is this Elder-Friendly? (e.g. easy to reach or access and use)?

30. Where bedrooms are shared, can patients control personal privacy? _____ Yes _____ No
    If yes, how and is this method Elder-Friendly (e.g. controls within reach, easy to operate, effective)?

31. Are patients able to see a nursing station and/or lounge/ dining area from their bedroom doorway? _____
    Yes _____ No

Air Quality

32. Does your ACE unit do any of the following to control odours or air quality (check all that apply)
    _____ Humidifiers, please specify manufacturer and model _____
    _____ De-humidifiers, please specify type & size _____
    _____ Deodorizers, please specify type & size _____
    _____ Other, please specify

33. Are noise levels in your ACE unit controlled by any design components (e.g. acoustic padding, ceiling tiles
    carpets) _____Yes _____No
    If Yes, specify location and type

    Are these changes Elder-Friendly? Please explain

34. Please rate the following physical environmental characteristics of your ACE unit's **patient bedrooms** in terms of Elder- Friendliness. Poor (1) to Excellent (5)

Patient Bedrooms	**Elder-Friendly (1-5)**	**If rating "Unfriendly" (1 or 2) please explain**
a) Layout (e.g. position of windows, visual access to bathroom, entry door, electrical/gas outlets)		
b) Size		
c) Furniture Arrangement		
d) Privacy		
e) Walking distance to lounge/dining areas		
f) Patient ability to view activity areas and nurses station		
g) Location and size of storage areas (e.g. space for assistive devices)		
h) Sink locations		

Patient Bedrooms	Elder-Friendly (1-5)	If rating "Unfriendly" (1 or 2) please explain
i) Space for visitors		
j) Other, please explain		

35. For each of the following please rate the Elder-Friendliness of your ACE unit as __compared to a regular unit__.

Elder-Friendliness	Worse	Same	Better	If rating "better" or "worse", compared to a regular unit, please explain
a) Flexibility of room usage (e.g. change from critical to general)				
b) Noise and Distraction				
c) Potential for interaction amongst patients				
d) Potential for interaction with family and family participation in care.				

Elder-Friendliness	Worse	Same	Better	If rating "better" or "worse", compared to a regular unit, please explain
e) Suitability for patient examination				
f) Patient monitoring and surveillance				
g) Suitability for collecting patient history				
h) Patient comfort (physical, psychological)				
i) Patient recovery rate				
j) Probability of medication error				

Elder-Friendliness	Worse	Same	Better	If rating "better" or "worse", compared to a regular unit, please explain
k) Probability of dietary mix-up				
l) Rate of nosocomial infection				
m) Falls incidence				
n) Amount of pain reduction/sleep inducing medication administered				

36. For each of the following please rate the Staff-Friendliness of your ACE unit as __compared to a regular unit__.

Staff-Friendliness	Worse	Same	Better	If rating "better" or "worse", please explain
a) Flexibility of room usage				
b) Suitability for patient examination				
c) Patient monitoring and surveillance				
d) Suitability for collecting patient history				

Patient Characteristics

37. Patients admitted to your ACE unit usually come from which of the following settings (check all that apply)?

Nursing home _____   Non-ICU medical units _____   Surgical unit _____
Living at home _____   Emergency department _____
Other, please specify

38. What is the average age (in years) of patients in your ACE unit: _____ ?

39. What is the average daily census in your ACE unit _____ ?

40. What is the average length of patient stay in your ACE unit (days) _____ ?
If available, what was the average length of patient stay before becoming an ACE unit (days) _____ ?

41. What are the <u>three most common</u> diagnoses in your ACE unit:
1st _____   2nd _____   3rd _____

42. What are the <u>three most common</u> clinical problems and/or needs of the patients in your ACE unit?
1st: _____
2nd: _____
3rd: _____

43. Which of the following consultative services are offered in your ACE unit (check all that apply)?

Pharmacy _____   Physical Therapy _____ Occupational Therapy _____   Social Work _____
Speech Pathology _____   Geriatric Psychiatry _____   Nutrition/dietary counselling _____
Other, please specify

44. Who is represented on the multidisciplinary team on your ACE unit (check all that apply)?

_____ MD _____ Intern _____ RN _____ LPN _____ Care Aid _____ Social Worker
_____ Psychiatrist _____ Dietician _____ Therapists, please specify _____
_____ Other, please specify

45. Have you conducted any Quality Improvement Reviews, if so what were the major findings (with regards to the physical environment)?

46. What outcome measures have been used to determine the impact of your ACE unit, what were the findings?

47. Are patients asked about their experience in your ACE unit? _____Yes _____ No
    If Yes, how have patients responded to your ACE unit? (i.e. what do they like/dislike)

48. Are visitors and family asked about their, or their family member's, experience in your ACE unit?
    ____ Yes ____ No
    If Yes, how have visitors/family responded to your ACE unit? (i.e. what do they like/dislike)

49. Have staff members been asked about their work experiences in your ACE unit? _____Yes _____ No
    If Yes, how have staff members responded to your ACE unit? (i.e. what do they like/dislike)

50. How does the physical environment of your ACE unit impact staff ability to do their job (e.g. increased or decreased stress, fatigue)? If so, what specific effects have you noticed and what has been the impact.

51. To your knowledge, has the physical environment of your ACE unit had an impact on patient safety (e.g. more/less falls, infections, delirium)? If so, what specific characteristics and what has been the impact.

52. Imagine that you are giving an older patient post-discharge instruction. Is there anything about the patient room that might have an influence on the older patient's ability to understand or remember your instructions? (e.g. distractions, lighting, noise,

53. Based on your experience, what features (e.g. flooring, lighting, furniture, colors) and layout (e.g. number of beds, position of furniture) are the most important in a patient room? Why?

54. Since opening, has your ACE unit had any renovation or other changes made to its physical design? If so, what and why?

55. If you were to re-design your ACE unit, or create a new ACE unit, are there any other changes you would make that you have not already mentioned? For example, are there features that you think would improve older patients healing, increase their ability for self-care or improve their morale and general well-being?

56. Are you including a floor plan and/or pictures of your ACE unit with your completed questionnaire? _____ Yes _____ No

Thank-you very much for taking the time to complete this questionnaire. Your input is invaluable.

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