

## PRoF Award abstract – Call 2015

# <MeDemA - Dementia-Friendly Hospital Environments>

### 1. Research Outline

Acronym	MeDemA
Project name in English	Dementia-Friendly Hospital Environments
Pitch (1 sentence)	This research project aims at developing evidence-based design recommendations on how to rearrange hospital buildings to become safe and healing environments for patients with dementia and satisfying work places for staff caring for this patient group.
Executive summary (max. 10 lines)	Acute care hospitals face great challenges caused by the increasing number of elderly patients and among them people with dementia. Dementia is rarely the reason for admission to hospitals, however, seriously affecting care routines and resulting in negative patient outcomes and high healthcare costs. A large body of research supports the relationship between the design of the built environment and well-being, functionality, and behavior among people with dementia. However, dementia-friendly design concepts were hardly introduced to the acute care setting. This research project aims at scientifically evaluating the effectiveness of new design solutions in hospitals to provide more evidence-based design recommendations for the establishment of dementia-friendly hospital environments in the future.

## 2. Cause and context of the research

The population of western countries is aging rapidly. Older age is consistently associated with an increased risk of disabilities and diseases, especially dementia. In the World Alzheimer's Report of 2014, it was estimated that about 44 million people worldwide were living with dementia. This number is expected to almost double by the year 2030. Dementia is a syndrome due to disease of the brain, which is characterized by a progressive decline in cognitive, social and emotional abilities. As a result, people affected are in need of assistance with numerous daily tasks.

Acute care hospitals face great challenges caused by the increasing number of patients with dementia. It can be assumed that 40% of all elderly patients over 70 years display demential symptoms (Sampson et al, 2009). Dementia is rarely the reason for admission to a hospital. It rather represents a secondary diagnosis in a significant number of elderly patients, however, affecting the daily care routines and future lives of patients tremendously. Hospitals are predominantly aligned to the efficient treatment of somatic diseases. The highly standardized care processes offer little room for the individual needs of patients with dementia. The unfamiliar hospital environment and the sometimes hasty care routines may cause patients' fear, worsening their disorientation or provoking challenging behaviour (Alzheimer's Society UK, 2009) which in turn, place a heavy burden on hospital staff and other patients (Rüsing et al, 2008 ; Schütz & Füsgen, 2013). The enforced passivity of patients during hospitalization may further lead to a deterioration of their physical condition (Creditor, 1993) and cognitive status. Many older patients are leaving hospitals with reduced ADL (activities of daily living) function (Covinsky et al, 2003). Consequently, many patients with dementia cannot be discharged back home but need to move to a nursing home instead (Joray et al, 2004; King, Jones & Brand, 2006). In addition, providing dementia care in hospitals is very cost-intensive because of an increased length of stay and greater care resources required (Adams et al., 2015; Connolly & O'Shea, 2013).

In recent decades, dementia friendly care concepts have been well established in different care facilities. In this context, the adaption of the built environment to the needs of people with dementia plays a vital role. A variety of studies shows the positive impact of specific features of the built environment on well-being, orientation, behaviour and ADL function among people with dementia (Day, Carreon & Stump. 2000; Marquardt, Bueter & Motzek, 2014). However, most of these findings are related to the nursing home setting. Dementia-friendly design concepts were hardly introduced to hospitals.

Our research group "Architecture under Demographic Change" (funded by the DFG - German Research Foundation), affiliated with the Chair for Social and Healthcare Buildings and Design at the TU Dresden, Germany, investigates ways to design dementia-friendly hospital environments. First, we conducted a systematic review on building design for people with dementia in long-term care facilities to gain an overview of the current state of research on this topic. Second, an analysis of the hospital environment in respect to the specific medical, organizational and architectural structures followed. And third, several design

suggestions from long-term care facilities were adapted and reinterpreted to fit the needs of the acute care setting and new design strategies were evolved. The scientific evaluation of their effectiveness is our major goal in order to add more evidence-based design recommendations to the future establishment of dementia-friendly hospital environments. Currently we are at the “Proof of Concept”-Stage, after having remodeled a hospital ward we are now evaluating the results for the specific stake holders.

### **3. Innovation results achieved**

We implemented a dementia-friendly design concept, which is in line with our research evidence, in a hospital ward of the Hospital “Diakonissenkrankenhaus” in Dresden, Germany. It is embedded in a larger research project on “People with Dementia in Acute Care Hospitals” which is funded by the Robert Bosch Foundation, Stuttgart, Germany.

In the past years, a few special wards, usually caring for patients with dementia only, have been established in acute care hospitals in Germany. There is no general concept for these wards yet but their positive effect on patients’ outcomes has been supported by various studies. Due to the high estimated number of dementia patients in hospitals, however, concepts and strategies for regular inpatient wards are needed, as they also cater to a high number of patients with dementia. Our research project MeDemA, therefore, focuses on the dementia-friendly adaptation of the built environment of a regular ward for internal medicine, which is characterized by a great proportion of elderly patients, and among them many people with dementia. It is an ongoing project in the proof of concept phase using pre- and post-occupancy evaluation. Baseline data collection and the refurbishment of the ward were recently finished. Follow-up data will be gathered in May of 2015. Data analysis will be completed by the end of the year of 2015.

The refurbishment of the ward includes the setting up of two model patient rooms, the implementation of an orientation system in the hallway, and the creation of an activity area for patients. The following main issues are addressed:

#### **Ambiance**

The creation of a homelike, non-institutional environment is a major goal in nursing homes for people with dementia. The aim is to give residents a sense of "being at home" and to facilitate their situational orientation. This way, they experience more quality of life, show less challenging behavior and more social interaction. Whether a homelike character would be suitable for hospitals, however, is questionable. Due to their exceptional medical situation, it may well be important to make patients with dementia aware of being in hospital due to a necessary medical treatment. Our strategy, therefore, was to create on the one hand a warm and welcoming atmosphere but on the other hand also to support patients’ situational orientation. To enhance the ambiance, the patient rooms were repainted in a light color and fresh color accents were added. The originally light gray flooring was replaced with a new floor surfacing of a warm and darker color. Medical and media equipment were

covered by a wall panel with a wooden surface and indirect lighting now creates a relaxing atmosphere. Further, the patient rooms were equipped with environmental cues to facilitate patients' understanding of where they are. A board, placed on the wall directly visible from patients' beds, provides information on the name of the hospital and the room number. A clock tells the time of day. Through these environmental changes, patients are supposed to feel safe and comfortable despite the unfamiliar surroundings.



## Orientation

Wayfinding is crucial for people with dementia to maintain their independence. However, their ability to orientate themselves especially in unfamiliar environments is limited. Besides the building structure, wayfinding signs and color coding are seen as important environmental cues promoting orientation among people with dementia. The personalization of environmental cues has been found to be especially supportive. Nameplates, portrait-type photographs and personal memorabilia can be placed outside of rooms to help patients locate their room. However, due to the short lengths of stay in hospitals and the organizational structures, the practicability of personalized cues in the acute care setting is limited. Therefore, in this research project an orientation system will be examined, which is supposed to be suitable for a wide range of patients. It begins in the ward's hallway and continues in patient rooms. Signs consisting of a large room number were attached to the doors of patient rooms. Further, a photograph with a regional motive, known by many

patients from this area, was added. To support memorability of these two items, they were also placed in patient rooms hypothesizing that patients will recognize the number and photograph easier when they are visible for them most of their time. Further, in double occupancy rooms the marking of beds and closets through signs, colors or symbols might help patients to find their personal place. Therefore, a color coding system was implemented in the two model rooms to help distinguish between spaces and to prevent conflicts between patients. Further, doors to bathrooms were clearly marked in order to be found. To improve the ability to locate the bathroom at night, a lighting system was installed directing patients to the bathroom in the dark.



### Activating environment

Staying active and engaged in meaningful activities during a hospital stay is crucial for patients with dementia to preserve their functionality but also to prevent challenging behavior. As residents in long-term care facilities can be easily engaged in daily activities such as helping with housework or preparing mealtimes, hospital staff states that their options are limited. Many elderly patients in hospitals spend their time inactive. Moreover, many ward layouts lack clarity and hospital staff reports having problems monitoring specifically wandering patients. Staffs' fear of patients leaving the ward unattended, thus being at risk of getting lost or injured, might result in restrictive behavior towards patients' mobility. Here our idea was to create opportunities for patients' activities in visual and spatial

proximity to the nursing station. Therefore, staff are able to monitor patients while doing other work. Further informal interactions outside of care routines might increase and improve the patient and staff relationship. A centrally located activity zone was created in the hallway close to the nursing station. This zone consists of a seating area and was enhanced with a variety of opportunities for activity such as reading material, an aquarium TV, and headphones to listen to music and short stories.



### **Economic Aspects**

A dementia-friendly hospital environment might help to reduce costs for hospitals and social security systems. Through the implementation of the design concept we expect to reduce behavioral and psychiatric symptoms (like anxiety or agitation) in patients with dementia, the number of falls, and carer distress. Therefore, a decrease in the length of stay of dementia patients and costs per patient is expected. To evaluate the effectiveness of the concept in regard to healthcare costs, we will use administrative data (cost) and medical records (length of stay, falls). Effects regarding staff distress will be assessed by interviewing the ward staff.

This research project will provide evidence-based information for healthcare facilities and architects on how to improve acute care for elderly patient with dementia by adapting the built environment to the needs of this highly vulnerable patient group. Simple and cost-

effective design solutions will be offered, which can mostly be implemented during regular renovation work but with expected major effects on patient, staff as well as economic outcomes.

#### **4. Link to the PRoF values**

The research project takes a further step towards the provision of better care for people with dementia in acute care hospitals by changing hospital buildings to become safe and healing environments for patients and satisfying work places for staff caring for this patient group. Environments need to be created which support the independence and functionality of patients and simultaneously provide a good connection between staff and patients. This might lead to improved outcomes for patients, better care routines and more sufficient organizational structures. Since dementia-friendly design can have beneficial effects not only for people with dementia but also for every other patient, who finds himself in the exceptional situation of being admitted to a hospital, architecture and design should incorporate an aesthetic approach which does not stigmatize, but rather suits a wide range of patients.

#### **5. Applicable IPR rules**

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#### **6. Information on the partners**

The Research Group “Architecture under Demographic Change” at the Chair for Social and Health Care Buildings and Design at the Technische Universität Dresden, Germany, works as an interdisciplinary team combining architecture with health sciences. Prof. Dr.-Ing. Gesine Marquardt has extensive research experiences in the field of building design for people with dementia. Her expertise becomes visible through numerous publications on this topic. Furthermore involved is Kathrin Büter, holding a master’s degree in interior architecture and working as a scientific assistant in the research group. Both Gesine Marquardt and Kathrin Büter conducted research stays in the United States visiting and analyzing acute care hospitals in respect to their dementia-friendly design. The important interdisciplinary perspective of the research group is strengthened by Tom Motzek, M.Sc., who works as a health scientist and scientific assistant in the research group.

## 7. References

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