



## CUMMULATIVE FUNDING SUMMARY

Report: Thursday, January 20, 2011

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FUNDING CYCLE:	<u>FY 2010-2011</u>
RESEARCH TITLE:	<b>Optimizing Toilet Location for Assisted Toileting</b>
AUTHORS:	<u>Dr. Sheila Bosch (Gresham, Smith &amp; Partners); Dr. Jon Sanford (Georgia Tech)</u>
ABSTRACT:	<u>The intent of the ADA Accessibility Guidelines for toilet rooms is to ensure that people with disabilities can use public rest room facilities... but do they? An increasing percentage of the US population has some form of mobility impairment requiring assistance with activities such as toileting. The Guidelines, however, are often a hindrance to the person(s) assisting, because they require the center line of the toilet to be 18" from the sidewall. This distance is too narrow for a caregiver to stand alongside a patient. However, the optimal distance of the toilet from the wall for assisted toileting is unknown. In the proposed study., data regarding the technical specifications for the toilet room will be analyzed. A repeated measures research design involving surveys and video observation of simulated toileting events will be conducted. The final outcome of thesis pilot study will be recommendations on how to design the toilet room to support assisted toileting.</u>
RESEARCH FINDINGS:	PENDING

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FUNDING CYCLE:	<u>FY 2009-2010</u>
RESEARCH TITLE:	<b>Environmental Correlates of Efficiency and Safety in Emergency Departments: An Exploratory Examination</b>
AUTHORS:	<u>Debajyoti Pati, PH.D., FIIA, LEED® AP Thomas E. Harvey Jr., AIA, MPH, FACHA, LEED® AP; CADRE Mary Ann Derr, RN, MBA; Synurgy Healthcare Solutions John M. Deledda, MD: The University Hospital, University of Cincinnati Sandra Lok, RN; Stantec</u>
ABSTRACT:	<u>This proposal (phase-I of a 3-phase study) will examine in-depth the physical design attributes of emergency departments, with the objective to developing a list of environmental correlates of safety and efficiency in ED operations. Increased quantity, timeliness, and intensity of care have created many challenges for the operation of EDs today. Interventions have been typically operational, although there is an implicit and growing recognition of the role of the physical environment. However, scientific literatures on ED physical design are not available. This proposal will adopt an exploratory, multi-measure approach to examine the interactions between ED operations and physical design at three sites, and identify domains of physical design decision-making that potentially influence efficiency and safety. Considering the crucial role of EDs in healthcare delivery, this study will provide important information to healthcare stakeholders, and constitute a foundation for future phases of this research.</u>
RESEARCH FINDINGS:	PENDING

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FUNDING CYCLE: FY 2009-2010

RESEARCH TITLE: **Area Calculation and Net-Gross Ratios in Hospital Design - year 2**

AUTHORS: D. Kirk Hamilton, FAIA, FACHA, EDAC, Associate Professor, Texas A & M  
Sarel Lavet, PH.D., Assistant Professor (CSM) Texas A & M

ABSTRACT: This proposal is a continuation of the study supported last year by the Academy of Architecture for Health Foundation. The purpose of the proposed study is to establish a publicly accessible database of healthcare and hospital area calculations that can be updated and maintained over time. Therefore, this study aims to calculate the ratio between departmental net and gross square footage in all departments within hospitals. Following are the research methods to be used in the proposed study: (1) a one-day consensus conference; (2) an invitation to participate in the project; (3) collection of project plans and drawings from design firms; (4) conducting surveys of the participating firms and their designers to discover the program intentions; and (5) analysis of the data by conducting net-to-gross area calculations. This proposal is limited to asking for funding that will allow the researchers to hire a full-time graduate student worker for the summer semester.

RESEARCH FINDINGS: PENDING

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FUNDING CYCLE: FY 2008-2009

RESEARCH TITLE: **Understanding Hospital Staff Perceptions of Relative Efficacy of Various Charting and Collaboration Space Configurations in Acute Care Inpatient Units Using Electronic Medical Record (EMR)**

AUTHORS: James T. Clark, Jr., AIA, Clark/KJOS Architects

ABSTRACT: Understanding hospital staff perceptions of relative efficacy of various charting and collaboration space configurations in acute care inpatient units using electronic medical record (EMR). Objectives in hospital acute care inpatient units, beyond treating illness or recovering from surgery or trauma, include quality, patient safety/reduction of errors, staff safety, staff satisfaction, patient experience/satisfaction, family participation, effective staff collaboration, and others. When designers, working with hospital end-user committees, are planning a new hospital inpatient care unit, they are faced with difficult choices in configuring staff work areas (charting, care planning, collaboration) within an overall unit plan. Choices include centralized, 'pods', corridor alcoves, bedside or a combination. This question is complicated by a variety of sizes (number of beds) and shapes (racetrack, triangles, 'L's') of the nursing unit, specialization of nursing units (medical, surgical, ortho, neuro, oncology, progressive care, etc.), varied nursing practice models, different types of EMR as well as degrees of adoption, varying ancillary support methods (nurse servers vs. supply alcoves vs. central supply rooms, central medication rooms vs. satellites, etc.). The electronic medical record (EMR) has dramatically changed planning opportunities to meet the clinical objectives in the first paragraph above—The most frequent and continuous activity for staff is documentation of the medical record, whether EMR or paper. EMR's emergence shows that it allows freedom of decentralization not possible in the past along. It also creates the risk of reducing direct contact between staff. Mobility of the medical record has changed the need for type and location of staff charting and collaboration space.

RESEARCH FINDINGS: PENDING

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FUNDING CYCLE: FY 2008-2009

RESEARCH TITLE: **Area Calculations and Net : Gross Ratios in Hospital Design**

AUTHORS: Kirk Hamilton, FAIA, FACHA  
Dr. Sarel Lavy, Texas A & M

ABSTRACT: The proposed study is based on the "Analysis of departmental area in contemporary hospitals: calculation methodologies and design factors in major patient care departments," as published on January 24, 2008, by D. Allison and D.K. Hamilton. The original pilot study was generously funded by the Academy of Architecture for Health Foundation (AAHF), Frank Zilm, and Don McKahan. The prior Allison and Hamilton study is used here as a prototype on which future measurements will be developed, and from which trends over time can be derived. The purpose of the proposed study is to establish a publicly accessible database of healthcare and hospital area calculations that can be updated and maintained over time. The searchable database will

contain collected data on industry trends for the ratio between departmental net and departmental gross square-footage in significant patient care, diagnostic, and treatment departments within hospitals, including Emergency, Radiology, Surgery, Acute Care Inpatient Units, and Intensive Care Units which were in the pilot study and all other departments. The goal is to make planning data available to the industry in a way that allows for better predictions of square footage requirements and improved performance of healthcare buildings.

RESEARCH FINDINGS: PENDING

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FUNDING CYCLE: FY 2008-2009

RESEARCH TITLE: **Patient Room Handedness and Caregiver Body Mechanics: Physical Design Correlates of Staff Body Mechanics in Patient Care Delivery**

AUTHORS: Dr. Debajyoti Pati, HKS, Inc.  
Thomas E. Harvey, Jr., AIA, MPH, FACHA, LEED® AP  
Jennie Evans, RN, BS, LEED® AP

ABSTRACT: The study objective was to examine how physical design configurations impact care processes. An intermediate objective was to identify patterns of care giving behavior in nurses of different characteristics, in acute medical-surgical care.

RESEARCH FINDINGS: Study data show that standardization of processes and workflow to the extent of force functioning staff location on the right side of the patient, in acute medical-surgical settings, may not be achievable owing to numerous factors. Thus, designing same-handed environments may not contribute to process and workflow standardization. However, data show that physical design standardization (as a construct distinct from environmental handedness), leading to familiarity with the physical work environment, constitute an advantage in acute medical-surgical settings

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FUNDING CYCLE: FY 2007-2008

RESEARCH TITLE: **Does the Size and Design of Family Areas within Patient Rooms Increase Family Involvement in Patient Care?**

AUTHORS: Dr. Sheila J. Bosch (Gresham, Smith & Partners);  
Young-Seon Choi (Georgia Institute of Technology);  
Dr. Craig Zimring (Georgia Institute of Technology)

ABSTRACT: Gresham, Smith & Partners, in collaboration with Georgia Tech, investigated how the size and design typology of the in-room ICU family area is associated with family presence and family-member interactions with patients and caregivers. As hospitals become more patient-centered, they strive to create environments that are pleasing and comfortable for not only patients, but also family members. Although there has been a fair amount of research investigating family presence and health-related outcomes, there is very little data concerning the effects of the physical design on family member involvement. This study compared two intensive care units at Tampa General Hospital with different sizes and family zone design typologies within patient rooms. Study environments include the following: 1) a trauma intensive care unit (2D) with an open and small sized family area (type A) which is less than 30 square feet accommodating a non-reclining and, 2) a neurological intensive care unit (5K) with an open and moderately sized family area (type B) which is approximately 55 square feet and can accommodate a sleeper sofa, reclining chair and a non-reclining chair. It also includes a privacy curtain. Additionally, family presence in the public waiting areas was also evaluated. Two research methods were used in this study: 1) behavior mapping in the unit to evaluate the frequency and duration of family visits to patient rooms, interactions among those observed, and family member/visitor presence in the unit; and, 2) staff member focus group(s).

RESEARCH FINDINGS: PENDING. Final analysis has not yet been completed, but preliminary analysis suggests that the more spacious family accommodations are associated with increased family presence.

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FUNDING CYCLE: FY 2007-2008

RESEARCH TITLE: **Evidence-based design meets evidence-based medicine: Validating new acoustic guidelines for healthcare facilities using a collaborative and trans-disciplinary approach for improving patient outcomes.**

AUTHORS: Jo M. Solet, Ph.D. (Principal Investigator);  
David M. Sykes, M.A.;  
Andrew Carballeira, B.M. (Co-Investigators)

ABSTRACT: Clinical and legal concerns have begun driving new priorities in acoustic design of healthcare facilities. Clinically, adverse noise levels degrade sleep quality, interrupt communication of patients and providers, and impose unnecessary stress on both patients and healthcare professionals. Recent federal legislation (HIPAA) mandates protection of patient speech privacy. Of importance to hospitals, inadequate privacy registers as one of the leading categories of patient complaints, contributing to lowered quality-of-care ratings at healthcare facilities. Through combined state-of-the-art technologies in acoustics and sleep physiology, with the cooperation of two Harvard Medical School teaching hospitals, our unique interdisciplinary team will develop and use a prototype for replicable adjustable sound simulation and subject exposure, providing evidence-based guideline validation for acoustics in healthcare facilities.

RESEARCH FINDINGS: PENDING.

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FUNDING CYCLE: FY 2007-2008

RESEARCH TITLE: **Impact of Single Family NICU Rooms on Family Behavior**

AUTHORS: Mardelle McCuskey Shepley (Texas A&M);  
Debra Harris (IDR Studio);  
Robert White (Memorial Hospital of South Bend)

ABSTRACT: The purpose of this research was to evaluate family interactions with staff, infants and other families in open bay and single family room (SFR) neonatal intensive care units. The study demonstrated that fewer interactions occurred in the single family rooms, but they were of longer duration. Almost all new NICU construction in the US is considering building SFRs, although there is little information on their effectiveness. This study was intended to examine the implications of this new health design trend.

RESEARCH FINDINGS: Family interactions with family members or families of other infants. Hypothesis 1, that there would be significantly more family interactions in the Open Bay setting than the SFR unit was not supported. The data in this study indicated that the mean time spent in conversation between the subject (parent) and parents of other infants was greater in the SFR unit than the Open Bay unit (p<0.05).

Family interactions with staff. Regarding hypothesis 2, no significant difference between the impact of unit types (SFR or Open Bay) on family interactions with staff was demonstrated.

Family interactions with their infants. Hypothesis 3, that families in SFRs would have more interactions with their infants than families in the Open Bay setting was supported for two of the variables. In the SFR, parents spent more time sitting and/or standing by their infant than in the Open Bay unit (p<0.05); also, parents in the SFR spent more time holding their infants than those in the Open Bay unit (p<0.05).

Total interactions. We collapsed the data to combine the total number of incidents of family interactions and total time spent in family interactions, both of which proved to show significant differences. Fifty-eight percent of all recorded incidences were in the Open Bay unit, compared to 42% in the SFR (p<0.05). However, the story differs when comparing the means of the duration of time spent on these activities. The mean for the SFR unit was 24.98 minutes with a standard deviation of 36.38 minutes. The mean for the Open Bay unit was 12.97 minutes with a standard deviation of 17.67 (p<0.05). The average amount of time spent on recorded incidences was nearly double in the SFR compared to the Open Bay unit.

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FUNDING CYCLE: FY 2005-2006

RESEARCH TITLE: **Integrated Knowledge Database**

AUTHORS: Eve A. Edelstein, Ph.D. (Neuro), M.Arch, Assoc. AIA

ABSTRACT: Information systems that extract detailed data about the influence of architectural elements on human responses will assist manufacturers and designers in the production and use of materials and systems that better serve user needs and outcomes. Text recognition systems could search and relate information in terms of relevance to an architectural project, so that programming and design reflect this information early in the process. For example, rather than a long list of article titles, a textual search on lighting systems might yield a table with the levels, frequency and timing of electrical lighting associated with a specific outcome or user group, linked to peer reviewed and validated research papers that support the findings. Reduction in the time taken to share and analyze information will serve productivity, and enable knowledge distribution more rapidly throughout each practice and the building community at large.

RESEARCH FINDINGS: N/A

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FUNDING CYCLE: FY 2005-2006

RESEARCH TITLE: **Analysis of Departmental Area in Contemporary Hospitals**

AUTHORS: David Allison, AIA, ACHA Clemson University;  
Kirk Hamilton, FAIA, FACHA Texas A&M University;  
Frank Zilm, FAIA, FACHA; with Scott Weinhoff, Clemson University;  
Megan Gerend, Clemson University;  
John Grant, Texas A&M University

ABSTRACT: This study documents and compares the relationship between departmental net and departmental gross square footages in five primary patient care, diagnostic and treatment departments within contemporary hospitals: Emergency, Radiology, Surgery, Acute Care Inpatient Units and Intensive Care Units. The study examined 98 departmental areas representing a cross section of work from 11 architecture firms, and hospitals located in 14 States. It sought to identify both a range and mean of departmental net to gross ratios in contemporary hospital design in the United States. No formal industry wide study has been conducted on departmental net to gross ratios since the then AIA Committee on Architecture and Health last prepared a report on this topic more than 25 years ago. Given the substantive changes in healthcare practices and technologies underway since then, the researchers were interested in finding out if common planning assumptions accurately reflect planning and design practices today.

RESEARCH FINDINGS: The original proposal expected to examine 20 departmental plans for each of the five departments; however some difficulty in acquiring plans from both firms and health systems limited the ultimate number [n] of plans studied for each department to 18 or 19. Significant ranges in departmental net to gross ratios – from 0.33 to 0.62 - were found in the study group while the mean net to gross ratio for each departmental category fell within a range of 1.52 to 1.60. The size of the study group, and the range in total square footage for the departmental areas available to the team, serve as significant qualifications to the results of the study. The research team feels that while this study was a valuable start for helping the industry understand the net and gross area impact of contemporary planning practices, a larger set of departments need to be examined before more definitive conclusions can be reached.

A secondary finding of the study discovered numerous potential variations in calculating departmental net and gross areas in contemporary facility design. An increasing range of "open" areas and other departmental design features require a significant number of judgment calls. This study indicates the need for better defined and shared industry standards in calculating departmental net and gross areas. It is hoped that the methodologies for calculating departmental net and gross areas used in this study can form the basis for industry standards.

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FUNDING CYCLE: FY 2005-2006

RESEARCH TITLE: **Development of Webinars for the AIA Academy of Architecture for Health**

AUTHORS: Ray Pentecost, Dr. PH, AIA, ACHA

ABSTRACT: Funding from the AAH Foundation made it possible for the AIA Academy of Architecture for Health to plan two 1 ½ hour webinars for the fall season, 2006. The first, "Decoding the New Guidelines for Healthcare Facilities," was scheduled for November 16, 2006 and the second, "Innovations for Surgical Practice," is scheduled for December 7, 2006. The first was to be presented by Kurt Rockstroh, AIA, ACHA and the second by George Tingwald, MD, AIA, ACHA. The first has been tentatively rescheduled to the first of 2007. One of the events already scheduled for Spring, 2007 is a presentation on innovations in imaging, to be led by Mo Stein, FAIA, FACHA.

RESEARCH FINDINGS: Based on lessons learned from previous and indeed the current webinar planning efforts the AIA AAH is moving toward several innovations for 2007, including an annual webinar calendar published at the start of the year, webinar activity planned throughout the year, not just in the Fall, and the introduction of innovative promotional devices, such as video clips of the speakers explaining the content of their presentations. In addition, the AIA AAH is contemplating archiving the webinars on their website for downstream use by individuals and firms unable to participate in the webinar event. Creative marketing at the AIA AAH spring conference (PDC with ASHE), the summer leadership conference, and the AIA AAH fall conference (with the Center for Health Design) will continue in an effort to build interest in AIA AAH webinar events.

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