RESEARCH IN A SNAP

OVERVIEW

We're keeping you updated on citations added to The Center's Knowledge Repository.

The Knowledge Repository is a collaborative effort between The Center for Health Design and our partners

Academy of Architecture for Health
an AIA Knowledge Community

The American Institute of Architects

AAHF Academy of Architecture for Health Foundation

ASHE Optimizing health care facilities

FGI

Additional key point summaries provided by

NIHD Nursing Institute for Healthcare Design
INSPIRING AND EDUCATING NURSES

RESEARCH DESIGN connections

Knowledge Repository News

Among the 68 new entries in the Knowledge Repository, several papers focus on the topic of wayfinding. A paper by Mustikawati and colleagues examines how humans execute wayfinding tasks as they navigate toward their destination in a building. Using space syntax, a study by Pouyan and colleagues focuses on circulation patterns, wayfinding strategies, and individual capabilities in wayfinding. Morag and Pintelon evaluate the use of digital wayfinding systems across twenty hospitals and discuss the complex realities of the challenges and benefits associated with these systems. And a study by van Buuren and Mohammadi explores how design can support wayfinding for seniors with dementia. See the citations listed in the "Experience" and "Elders/Aging" categories below.

(Papers published ahead of print "in press" will be updated as volume and page information becomes available.)

September - October 2021

COVID-19

1. Al-Benna, S. (2021). Negative pressure rooms and COVID-19. *Journal of Perioperative Practice, 31*(1–2), 18–23. https://doi.org/10.1177/1750458920949453
2. Albert, H., Heipel, D., Thakre, T. P., Hess, O., Cooper, K., Pryor, R., Smallacombe, M., Moore, C., Godbout, E., Findling, R., & Bearman, G. (2021). Management of the COVID-19-infected psychiatric inpatients: Unique infection prevention considerations and evolving strategies. *Current Treatment Options in Infectious Diseases*, in press. https://doi.org/10.1007/s40506-021-00255-8
3. Bahadur, G. K., Jodheea-Jutton, A., Mowlabaccus, W. B., Callychurn, D., & Ramasamy, S. (2021). Design and development of isolating pods to prevent the spread of Coronavirus or other viruses for hospital and domestic purposes. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211045398
4. Fawwaz Alrebi, O., Obeidat, B., Atef Abdallah, I., Darwish, E. F., & Amhamed, A. (2021). Airflow dynamics in an emergency department: A CFD simulation study to analyse COVID-19 dispersion. *Alexandria Engineering Journal*, in press. https://doi.org/10.1016/j.aej.2021.08.062

5. Ghaffari, H. R., Farshidi, H., Alipour, V., Dindarloo, K., Azad, M. H., Jamalidoust, M., Madani, A., Aghamolaei, T., Hashemi, Y., Fazlzadeh, M., & Fakhri, Y. (2021). Detection of SARS-CoV-2 in the indoor air of intensive care unit (ICU) for severe COVID-19 patients and its surroundings: Considering the role of environmental conditions. *Environmental Science and Pollution Research*, in press. https://doi.org/10.1007/s11356-021-16010-x

6. Lesan, M., Khozaei, F., Kim, M.-J., & Shahidi Nejad, M. (2021). Identifying health care environment contradictions in terms of infection control during a pandemic with a focus on health workers' experience. *Sustainability, 13*(17), Article 17. https://doi.org/10.3390/su13179964

7. Miller, S. L., Mukherjee, D., Wilson, J., Clements, N., & Steiner, C. (2021). Implementing a negative pressure isolation space within a skilled nursing facility to control SARS-CoV-2 transmission. *American Journal of Infection Control, 49*(4), 438–446. https://doi.org/10.1016/j.ajic.2020.09.014

8. Mousavi, E. S., Mohammadi Nafchi, A., DesJardins, J. D., LeMatty, A. S., Falconer, R. J., Ashley, N. D., Roth, B. S., & Moschella, P. (2022). Design and in-vitro testing of a portable patient isolation chamber for bedside aerosol containment and filtration. *Building and Environment, 207*. https://doi.org/10.1016/j.buildenv.2021.108467

9. Squire, M. M., Munsamy, M., Lin, G., Telukdarie, A., & Igusa, T. (2021). Modeling hospital energy and economic costs for COVID-19 infection control interventions. *Energy and Buildings, 242*. https://doi.org/10.1016/j.enbuild.2021.110948

10. Tan, T., Mills, G., Hu, J., & Papadonikolaki, E. (2021). Integrated approaches to design for manufacture and assembly: A case study of Huoshenshan Hospital to combat COVID-19 in Wuhan, China. *Journal of Management in Engineering, 37*(6). https://doi.org/10.1061/(ASCE)ME.1943-5479.0000972

Experience

Perceived Quality of Care (Noise, Communication, Waiting, etc.)

11. Amoatey, P., Al-Harthy, I., Al-Mushaifari, M. A., Al-Jabri, K., & Al-Mamun, A. (2021). Effect of ambient noise on indoor environments in a health care facility in Oman. *Environmental Science and Pollution Research*, in press. https://doi.org/10.1007/s11356-021-16875-y

12. Rahimi-Mehr, V. (2021). Light and color therapy: The role of light and color in architecture from the perspective of traditional Persian medicine. *Traditional Medicine Research, 6*(5), 47. https://doi.org/10.53388/TMR20210606234

Supportive Design (Social Support, Distractions, Nature, etc.)

13. Craig, T., Mathieu, S., Morden, C., Patel, M., & Matthews, L. (2021). A prospective multicentre observational study to quantify nocturnal light exposure in intensive care. *Journal of the Intensive Care Society*, in press. https://doi.org/10.1177/17511437211045325

14. Duane, J.-N., Blanch-Hartigan, D., Sanders, J. J., Caponigro, E., Robicheaux, E., Bernard, B., Podolski, M., & Ericson, J. (2021). Environmental considerations for effective telehealth encounters: A narrative review and implications for best practice. *Telemedicine and E-Health*, in press. https://doi.org/10.1089/tmj.2021.0074
15. Fudickar, A., Konetzka, D., Nielsen, S. M. L., & Hathorn, K. (2021). Evidence-based art in the hospital. *Wiener Medizinische Wochenschrift*, in press. https://doi.org/10.1007/s10354-021-00861-7
16. Gashoot, M. M. (2021). Revisiting healing environments: Islamic interior elements in hospital rooms in North Africa. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211042350
17. Grailey, K., Leon-Villapalos, C., Murray, E., & Brett, S. J. (2021). The psychological impact of the workplace environment in critical care: A qualitative exploration. *Human Factors in Healthcare*, in press. https://doi.org/10.1016/j.hfh.2021.100001
18. Kelly, D., & Pingel, M. J. (2021). Space use and the physical attributes of acute care units: A quantitative study. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211043848
19. Khine, T. T., Workman, B., Pan, H., & Aung, N. C. (2021). Deployable designs to temporarily convert subacute hospital rooms into palliative care rooms. *Australasian Journal on Ageing*, in press. https://doi.org/10.1111/ajag.12983
20. Morag, I., & Pintelon, L. (2021). Digital wayfinding systems in hospitals: A qualitative evaluation based on managerial perceptions and considerations before and after implementation. *Applied Ergonomics, 90*. https://doi.org/10.1016/j.apergo.2020.103260
21. Mustikawati, T., Yatmo, Y. A., & Atmodiwirjo, P. (2021). Tours and maps operations as movement mechanism in indoor wayfinding. *International Journal of Technology, 12*(4), 291–319. https://doi.org/10.14716/ijtech.v12i4.4796
22. Pleban, D., Radosz, J., Kryst, L., & Surgiewicz, J. (2021). Assessment of working conditions in medical facilities due to noise. *International Journal of Occupational Safety and Ergonomics*, in press. https://doi.org/10.1080/10803548.2021.1987692
23. Pouyan, A. E., Ghanbaran, A., & Shakibamanesh, A. (2021). Impact of circulation complexity on hospital wayfinding behavior (Case study: Milad 1000-bed hospital, Tehran, Iran). *Journal of Building Engineering, 44*. https://doi.org/10.1016/j.jobe.2021.102931
24. Ramadan, M. A., Abouelmagd, D., & Amer, A. (2021). The architectural design of outdoor spaces in oncology hospitals: Toward achieving social sustainability for oncology patients. In C. Alalouch, C. Piselli, & F. Cappa (Eds.), Towards Implementation of Sustainability Concepts in Developing Countries (pp. 207–226). *Springer International Publishing*. https://doi.org/10.1007/978-3-030-74349-9_17
25. Scott, J., Langsrud, K., Goulding, I. R., & Kallestad, H. (2021). Let there be blue-depleted light: In-patient dark therapy, circadian rhythms and length of stay. *BJPsych Advances, 27*(2), 73–84. https://doi.org/10.1192/bja.2020.47

26. Søndergaard, S. F., Beedholm, K., Kolbæk, R., & Frederiksen, K. (2021). Patients' and nurses' experiences of all single-room hospital accommodation: A scoping review. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211047548

27. Stroebel, R. J., Obeidat, B., Lim, L., Mitchell, J. D., Jasperson, D. B., & Zimring, C. (2021). The impact of clinic design on teamwork development in primary care. *Health Care Management Review, 46*(3), 257–264. https://doi.org/10.1097/HMR.0000000000000259

28. Sukkasi, S., Tunnukit, P., & Lerspalungsanti, S. (2021). Developing assistive bedside furniture for early postoperative mobilization in a healthcare setting with an attentive empathetic design approach. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211051716

29. Timonen, K., & Timonen, T. (2021). Art as contextual element in improving hospital patients' well-being: A scoping review. *Journal of Applied Arts & Health, 12*(2), 177–191. https://doi.org/10.1386/jaah_00067_1

30. Tseung, V., Verweel, L., Harvey, M., Pauley, T., & Walker, J. (2021). Hospital outdoor spaces: User experience and implications for design. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211045403

31. Vethe, D., Scott, J., Engstrøm, M., Salvesen, Ø., Sand, T., Olsen, A., Morken, G., Heglum, H. S., Kjørstad, K., Faaland, P. M., Vestergaard, C. L., Langsrud, K., & Kallestad, H. (2021). The evening light environment in hospitals can be designed to produce less disruptive effects on the circadian system and improve sleep. *Sleep, 44*(3). https://doi.org/10.1093/sleep/zsaa194

32. Yuan, F., Yao, R., Sadrizadeh, S., Li, B., Cao, G., Zhang, S., Zhou, S., Liu, H., Bogdan, A., Croitoru, C., Melikov, A., Short, C. A., & Li, B. (2022). Thermal comfort in hospital buildings – A literature review. *Journal of Building Engineering, 45*. https://doi.org/10.1016/j.jobe.2021.103463

Safety

Infection Prevention/Control

33. Bäumler, W., Eckl, D., Holzmann, T., & Schneider-Brachert, W. (2021). Antimicrobial coatings for environmental surfaces in hospitals: A potential new pillar for prevention strategies in hygiene. *Critical Reviews in Microbiology*, in press. https://doi.org/10.1080/1040841X.2021.1991271

34. Chiang, C.-H., Chiang, C.-H., Lee, G. H., Qian, F., Chen, S.-C., & Lee, C.-C. (2020). Time to Implement the European Society of Cardiology 0/1-Hour Algorithm. *Annals of Emergency Medicine, 76*(5), 690–692. https://doi.org/10.1016/j.annemergmed.2020.05.038

35. Fraser, V. J., Johnson, K., Primack, J., Jones, M., Medoff, G., & Dunagan, W. C. (1993). Evaluation of rooms with negative pressure ventilation used for respiratory isolation in seven Midwestern hospitals. *Infection Control & Hospital Epidemiology, 14*(11), 623–628. https://doi.org/10.2307/30149744

36. Harmon, M., & Lau, J. (2021). The Facility Infection Risk EstimatorTM: A web application tool for comparing indoor risk mitigation strategies by estimating airborne transmission risk. *Indoor and Built Environment*, in press. https://doi.org/10.1177/1420326X211039544

37. Montalli, V. A. M., Freitas, P. R. d, Torres, M. d F., Torres Junior, O. d F., Vilhena, D. H. M. D., Junqueira, J. L. C., & Napimoga, M. H. (2021). Biosafety devices to control the spread of potentially contaminated dispersion particles. New associated strategies for health environments. *PLOS ONE, 16*(8), e0255533. https://doi.org/10.1371/journal.pone.0255533

38. Simmons, S., Wier, G., Pedraza, A., & Stibich, M. (2021). Impact of a pulsed xenon disinfection system on hospital onset Clostridioides difficile infections in 48 hospitals over a 5-year period. *BMC Infectious Diseases, 21*(1). https://doi.org/10.1186/s12879-021-06789-y

39. Ting Wu, H., Shuang Li, Q., Chen Dai, R., Liu, S., Wu, L., Mao, W., & Hua Ji, C. (2021). Effects of air-conditioning systems in the public areas of hospitals: A scoping review. *Epidemiology and Infection, 149*, e201. https://doi.org/10.1017/S0950268821001990

40. Yousefzadeh, A., Maleki, A., Athar, S. D., Darvishi, E., Ahmadi, M., Mohammadi, E., Tang, V. T., Kalmarzi, R. N., & Kashefi, H. (2021). Evaluation of bio-aerosols type, density, and modeling of dispersion in inside and outside of different wards of educational hospital. *Environmental Science and Pollution Research*, in press. https://doi.org/10.1007/s11356-021-16733-x

Medication Safety

41. Chen, Y., Broman, A. T., Priest, G., Landrigan, C. P., Rahman, S. A., & Lockley, S. W. (2021). The effect of blue-enriched lighting on medical error rate in a university hospital ICU. *The Joint Commission Journal on Quality and Patient Safety, 47*(3), 165–175. https://doi.org/10.1016/j.jcjq.2020.11.007

Care across the Lifespan

Therapeutic Environments: Behavioral/Mental Health

42. Kim, M.-K., & Park, N.-K. (2021). Evaluating the impact of a multisensory environment on target behaviors of children with Autism Spectrum Disorder. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211050686

43. Strömberg, M., Liman, L., Bang, P., & Igelström, K. (2021). Experiences of sensory overload and communication barriers by autistic adults in health care settings. *Autism in Adulthood*. https://doi.org/10.1089/aut.2020.0074

Psychiatric Facilities

44. Okkels, N., Jensen, L. G., Skovshoved, L. C., Arendt, R., Blicher, A. B., Vieta, E., & Straszek, S. (2020). Lighting as an aid for recovery in hospitalized psychiatric patients: A randomized controlled effectiveness trial. *Nordic Journal of Psychiatry, 74*(2), 105–114. https://doi.org/10.1080/08039488.2019.1676465

Pediatric

45. Hybschmann, J., Topperzer, M. K., Gjærde, L. K., Born, P., Mathiasen, R., Sehested, A. M., Jennum, P. J., & Sørensen, J. L. (2021). Sleep in hospitalized children and adolescents: A scoping review. *Sleep Medicine Reviews, 59*. https://doi.org/10.1016/j.smrv.2021.101496

46. Kelada, L., Wakefield, C. E., De Graves, S., Treadgold, C., Dumlao, G., Schaffer, M., & O'Brien, T. (2021). Evaluation of an in-hospital recreation room for hospitalised children and their families. *Journal of Pediatric Nursing, 61*, 191–198. https://doi.org/10.1016/j.pedn.2021.05.017

47. Silva, M., Barretta, F., Luksch, R., Terenziani, M., Casanova, M., Spreafico, F., Meazza, C., Podda, M., Biassoni, V., Schiavello, E., Chiaravalli, S., Puma, N., Bergamaschi, L., Gattuso, G., Sironi, G., Adduci, A., Grampa, P., Massimino, M., & Ferrari, A. (2021). Adolescents with cancer on privacy: Fact-finding survey on the need for confidentiality and space. *Tumori Journal*, in press. https://doi.org/10.1177/0300891620988357

Elders/Aging

48. Hugunin, J., Yuan, Y., Rothschild, A. J., Lapane, K. L., & Ulbricht, C. M. (2021). Risk factors associated with suicidal ideation in newly admitted working-age nursing home residents. *Journal of Affective Disorders, 295*, 243–249. https://doi.org/10.1016/j.jad.2021.08.042

49. Jingyi, M., Shanshan, Z., & Wu, Y. (2021). The influence of physical environmental factors on older adults in residential care facilities in Northeast China. HERD: *Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211036705

50. van den Berg, A. E., Maas, J., van den Hoven, L., & Tanja-Dijkstra, K. (2021). Greening a geriatric ward reduces functional decline in elderly patients and is positively evaluated by hospital staff. *Journal of Aging and Environment, 35*(2), 125–144. https://doi.org/10.1080/26892618.2020.1805390

Cognitive Impairment & Dementia

51. Figueiro, M. G., & Leggett, S. (2021). Intermittent light exposures in humans: A case for dual entrainment in the treatment of Alzheimer's disease. *Frontiers in Neurology, 12*, 296. https://doi.org/10.3389/fneur.2021.625698

52. Figueiro, M. G., Page, E., & Rea, M. S. (2020). Measuring dose in a tailored lighting intervention to improve sleep and mood in Alzheimer's disease patients. *Alzheimer's & Dementia, 16*(S7), e037168. https://doi.org/10.1002/alz.037168

53. Keuning-Plantinga, A., Roodbol, P., van Munster, B. C., & Finnema, E. J. (2021). Experiences of informal caregivers of people with dementia with nursing care in acute hospitals: A descriptive mixed-methods study. *Journal of Advanced Nursing*, in press. https://doi.org/10.1111/jan.15042

54. Kolberg, E., Pallesen, S., Hjetland, G. J., Nordhus, I. H., Thun, E., & Flo-Groeneboom, E. (2021). Insufficient melanopic equivalent daylight illuminance in nursing home dementia units across seasons and gaze directions. *Lighting Research & Technology*, in press. https://doi.org/10.1177/1477153521994539

55. van Buuren, L. P. G., & Mohammadi, M. (2021). Dementia-friendly design: A set of design criteria and design typologies supporting wayfinding. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211043546

56. Wang, W., & Lu, Z. (2021). Influences of physical environmental cues on people with Dementia: A scoping review. *Journal of Applied Gerontology*, in press. https://doi.org/10.1177/07334648211050376

Aging in Place/Healthcare at Home

57. Ma, C., Guerra-Santin, O., & Mohammadi, M. (2021). Smart home modification design strategies for ageing in place: A systematic review. *Journal of Housing and the Built Environment*, in press. https://doi.org/10.1007/s10901-021-09888-z

Building Systems & Technology

58. Clough, I. (2021). Building back smarter—part one: The case for more modular facilities in the NHS. *British Journal of Healthcare Management*, in press. https://doi.org/10.12968/bjhc.2021.0104

Design & Evaluation (e.g., Process, Methods, Simulation Modeling)

59. Beauvais, B., Richter, J. P., Kim, F. S., Palmer, E. L., Spear, B. L., & Turner, R. C. (2021). A reason to renovate: The association between hospital age of plant and value-based purchasing performance. *Health Care Management Review, 46*(1), 66–74. https://doi.org/10.1097/HMR.0000000000000227

60. El-Hadedy, N., & El-Husseiny, M. (2021). Evidence-based design for workplace violence prevention in emergency departments utilizing CPTED and space syntax analyses. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211042902

61. Fahsold, A., Fleming, R., Verbeek, H., Holle, B., & Palm, R. (2021). German translation, linguistic validation, and cultural adaptation of the environmental audit tool—High care. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211043073

62. Ghaffari, F., Shabak, M., Norouzi, N., & Nayyeri Fallah, S. (2021). Hospital salutogenic public spaces: A conceptual framework of effective perceptional environment quality components on patients' satisfaction. International Journal of Building Pathology and Adaptation, in press. https://doi.org/10.1108/IJBPA-05-2021-0071

63. Ghamari, H., & Golshany, N. (2021). Wandering eyes: Using gaze-tracking method to capture eye fixations in unfamiliar healthcare environments. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211042344

64. Joseph, A., Mihandoust, S., Wingler, D., Machry, H., Allison, D., & Reeves, S. T. (2021). Comparing user perceptions of surgical environments: Simulations in a high-fidelity physical mock-up versus a postoccupancy evaluation. *HERD: Health Environments Research & Design Journal*, in press. https://doi.org/10.1177/19375867211044733

65. Nino, V., Martinez, K., Gomez, K., & Claudio, D. (2021). Improving the registration process in a healthcare facility with lean principles. *Journal of Industrial Engineering and Management, 14*(3), 538. https://doi.org/10.3926/jiem.3432

66. Rich, R. K., Jimenez, F. E., Bohacek, C., Moore, A., Heithoff, A. J., Conley, D. M., & Brittin, J. (2021). The HDR CARE Scale, Inpatient Version: A validated survey instrument to measure environmental affordance for nursing tasks in inpatient healthcare settings. *PLOS ONE, 16*(10). https://doi.org/10.1371/journal.pone.0258815

67. Saha, S., Noble, H., Xyrichis, A., Hadfield, D., Best, T., Hopkins, P., & Rose, L. (2022). Mapping the impact of ICU design on patients, families and the ICU team: A scoping review. *Journal of Critical Care, 67*, 3–13. https://doi.org/10.1016/j.jcrc.2021.07.002

68. Quirke, M., Ostwald, M., Fleming, R., Taylor, M., & Williams, A. (2021). A design assessment tool for layout planning in residential care for dementia. *Architectural Science Review*, in press. https://doi.org/10.1080/00038628.2021.1984869