

Yong K. Choi, PhD, MPH

Curriculum Vitae

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PRIMARY RESEARCH INTERESTS

Technology and Aging; Smart Home Technology for Aging-in-Place; Behavioral Sensing; AI-powered Data Analytics and Insights; Technology for Family Caregiving; Technology for Shared Decision Making; mHealth Interventions; Chronic Disease Self-Management and Prevention; Evaluation of Health Information Systems

EDUCATION

- **Ph.D., Biomedical and Health Informatics**, December 2018
University of Washington School of Medicine, Seattle WA
Dissertation Title: Examining the Feasibility of Internet of Things Technologies to Support Aging-in-Place
Dissertation Chairs: Dr. George Demiris and Dr. Hilaire J. Thompson
- **M.P.H., Health Policy & Management**, May 2014
Texas A&M Health Science Center, College Station TX
- **B.S., Computer Science**, May 2011
Texas A&M University, College Station TX

POSITIONS HELD

- **Assistant Professor**, Oct 2022
University of Pittsburgh, School of Health and Rehabilitation Sciences
Health Information Management Department
- **Assistant Adjunct Professor**, Sep 2020 – Sep 2022
University of California Davis, School of Medicine,
Public Health Sciences Department-Division of Health Informatics
- **Postdoctoral Scholar**, Feb 2019 – Aug 2020
University of California Davis, Betty Irene Moore School of Nursing
Mentor: Dr. Katherine K. Kim

PUBLICATIONS

Peer-Reviewed Journal Articles:

- [18] Lee JS, **Choi YK**, Heng F, Tejuco K, Kesarwani M. Medication Beliefs of P2Y12 Inhibitors on Twitter: An Exploratory Thematic and Semantic Analysis. JMIR Formative Research [preprint]

- [17] Kang Y, **Choi YK**, Stehlik J, Nielsen JD, Reid MC. Pain in Homebound Older Adults with Heart Failure after Hospital Discharge. *Home Healthcare Now*. 2021 Sep 1;39(5):278-85.
- [16] **Choi YK**, Thompson HJ, Demiris G. Internet-of-Things Smart Home Technology to Support Aging-in-Place: Older Adults' Perceptions and Attitudes. *Journal of Gerontological Nursing*. 2021 Apr 1;47(4):15-21.
- [15] **Choi YK**, Thompson HJ, Demiris G. Use of an Internet-of-Things smart home system for healthy aging of older adults in their residential setting: A Feasibility Study. *JMIR Aging*. *JMIR Aging* 2020;3(2):e21964. doi: 10.2196/21964
- [14] Petrescu-Prahova M, Osterhage K, Taylor JO, Painter I, **Choi YK**, Turner AM. Older adult health-related support networks: implications for the design of digital communication tools. *Innovation in Aging*. 2020 Jun 9.
- [13] Kravitz RL, Aguilera A, Chen EJ, **Choi YK**, Hekler E, Karr C, Kim KK, Phatak S, Sarkar S, Schueller SM, Sim I. Feasibility, Acceptability, and Influence of mHealth-Supported N-of-1 Trials for Enhanced Cognitive and Emotional Well-being in US Volunteers. *Frontiers in Public Health*. 2020;8:260.
- [12] Kearns WR, Chi NC, **Choi YK**, Lin SY, Thompson H, Demiris G. A Systematic Review of Health Dialog Systems. *Methods of Information in Medicine*. 2019 Dec;58(06):179-93.
- [11] **Choi YK**, Lazar A, Demiris G, Thompson HJ. Emerging Smart Home Technologies to Facilitate Engaging with Aging. *Journal of Gerontological Nursing*. 2019 Nov 22;45(12):41-48.
- [10] **Choi YK**, Demiris G, Lin SY, Iribarren SJ, Landis CA, Thompson HJ, McCurry SM, Heitkemper MM, Ward TM. Smartphone applications to support sleep self-management: Review and evaluation. *Journal of Clinical Sleep Medicine*. 2018 Oct 15;14(10):1783-90.
- [9] Turner AM, **Choi YK**, Dew K, Tsai M-T, Bosold AL, Wu S, et al. Evaluating the Usefulness of Translation Technologies for Emergency Response Communication: A Scenario-Based Study. *JMIR Public Health Surveillance*. 2018;5(1):e11171.
- [8] Dew KN, Turner AM, **Choi YK**, Bosold A, Kirchhoff K. Development of machine translation technology for assisting health communication: A systematic review. *Journal of Biomedical Informatics*. 2018 Sep;85:56-67. doi: 10.1016/j.jbi.2018.07.018. Epub 2018 Jul 19.
- [7] Sakaguchi-Tang DK, Bosold AL, **Choi YK**, Turner AM. Patient Portal Use and Experience Among Older Adults: Systematic Review. *JMIR Medical Informatics*. 2017 Oct;5(4).
- [6] Kneale L, Mikles S, **Choi YK**, Thompson H, Demiris G. Using scenarios and personas to enhance the effectiveness of heuristic usability evaluations for older adults and their care team. *Journal of Biomedical Informatics*. 2017 Sep 1;73:43-50.
- [5] Lai AM, Hsueh PY, **Choi YK**, Austin RR. Present and future trends in consumer health informatics and patient-generated health data. *Yearbook of medical informatics*. 2017 Aug;26(01):152-9.
- [4] Backonja U, Nai-Ching C, **Choi YK**, Hall AK, Le T, Kang Y, Demiris G. Visualization approaches to support healthy aging: A systematic review. *Journal of Innovation in Health Informatics*. 2016 Oct 10;23(3):860.
- [3] Bock C, Demiris G, **Choi YK**, Le T, Thompson HJ, Samuel A, Huang D. Engaging older adults in the visualization of sensor data facilitated by an open platform for connected devices. *Technology and Health Care*. 2016 Jan 1;24(4):541-50.

- [2] Kneale L, **Choi YK**, Demiris G. Assessing commercially available personal health records for home health: Recommendations for Design. *Applied Clinical Informatics*. 2016 Feb;7(02):355-67.
- [1] Ojinnaka CO, **Choi YK**, Kum HC, Bolin JN. Predictors of colorectal cancer screening: does rurality play a role?. *The Journal of Rural Health*. 2015 Jul 1;31(3):254-68.

Peer-Reviewed Publications in Conference Proceedings:

- [3] Li Y, Fujiwara T, **Choi YK**, Kim KK, Ma K-L. A visual analytics system for multi-model comparison on clinical data predictions. *Visual Informatics*, 4(2), 122–131. doi.org/10.1016/j.visinf.2020.04.005
- [2] **Choi YK**, López JE, Meeker D, Ohno-Machado L, Kim KK. Engaging heart failure patients from a clinical data research network: A survey on willingness to participate in different types of research. *AMIA Annual Symposium Proceedings*. 2020 Mar 4;2019:305-312. PMID: 32308823; PMCID: PMC7153117
- [1] **Choi YK**, Kirchhoff K, Turner AM. Medical Text Simplification by Medical Trainees: A Feasibility Study. 2016 IEEE International Conference on Healthcare Informatics (ICHI). Chicago, IL, 2016, pp. 334-340. doi: 10.1109/ICHI.2016.61

Peer-Reviewed Conference Abstracts:

- [18] Yang MS, Wang H, **Choi YK**, The Association Between the Use of Digital Health Management Tools and Subjective Well-being Among Older Adults. Virtual Paper Presentation at Gerontological Society of America (GSA) Annual Symposium 2021.
- [17] Yang MS, Wang H, **Choi YK**, Barriers that Contribute to the Digital Divide Among Older Community Dwelling Adults in Later Life. Virtual Poster Presentation at Gerontological Society of America (GSA) Annual Symposium 2021.
- [16] Yang MS, Wang H, **Choi YK**, The association between technology use and chronic health conditions among older adults. Virtual Poster Presentation at American Public Health Association (APHA) Annual Symposium 2021.
- [15] Pighin M, **Choi YK**. The Evaluation of Smart Speaker Skills for Chronic Disease Management of Older Adults. Virtual Poster Presentation at Gerontological Society of America (GSA) Annual Symposium 2021.
- [14] Weakley A, Liu X, Duvvur S, Kaushal H, Mussi N, Namboodiri S, **Choi Y**, Farias ST. Interactive Care: A web-based platform for remote caregiving and functional independence in older adults with cognitive impairment. In 2021 Alzheimer's Association International Conference 2021 Jul 26. ALZ.
- [13] Lee JS, Heng F, **Choi YK**, Kesarwani M. Understanding patient perspectives of dual antiplatelet therapy: A sentiment and emotional analysis of twitter posts from the general public. Poster Presentation at Cardiovascular Research Technologies (CRT) Conference 2020.
- [12] Lee JS, **Choi YK**, Lopez J. A review and evaluation of smartphone applications to support virtual cardiac rehabilitation. *Journal of the American College of Cardiology*. 2020 Mar 24;75(11 Supplement 1):364

- [11] **Choi YK**, Lin SH, Kneale L, Thompson HJ, Demiris G. Older adults' perceptions of obtrusiveness of IoT-smart home technologies. Oral Presentation at 2019 Aging and Health Informatics Conference. 11 Dec 2019; Austin, TX
- [10] **Choi YK**, Thompson HJ, Demiris G. A Voice-Interaction Mediated Smart Home to Support Aging-In Place: A New Paradigm to Engage with Health Related Data. Oral Presentation at Gerontological Society of America (GSA) Annual Symposium. 15 Nov 2019; Austin, TX.
- [9] **Choi YK**, Pratap A, Thompson HJ, Demiris G. Evaluating the preferences of older adults in utilizing insights from smart home connected devices. Poster Presentation at The Council for the Advancement of Nursing Science 2019 Advanced Methods Conference: Sensor Technology in Research. 23 Oct 2019; Washington DC.
- [8] **Choi YK**, Demiris G, Thompson HJ. Feasibility of Smart Speaker Use to Support Aging in Place. Oral Presentation at Gerontological Society of America (GSA) Annual Symposium. 16 November 2018; Boston, MA.
- [7] Casanova-Perez RA, Padilla-Huamantinc PG, De Freitas-Vidal CI, **Choi YK**. Home Behavior Monitoring Module in OpenEMR: Use of home sensors as Patient-Generated Data (PGD) for elderly care. Student Design Challenge Poster presented at the American Medical Informatics Association (AMIA) Symposium. 6 November 2017; Washington DC.
- [6] **Choi YK**, Thompson HJ, Demiris G. Feasibility of Internet of Things Technologies to Support Aging. Poster presented at 2017 IEEE International Conference on Healthcare Informatics (ICHI) Doctoral Consortium. 25 August 2017; Park City, UT.
- [5] **Choi YK**, Demiris G, Oliver DP, Washington KT. Challenges faced by the oldest old in the caregiving role: observations from the hospice setting. Oral Presentation at Gerontological Society of America (GSA) Annual Symposium. 17 November 2016; New Orleans, LA.
- [4] **Choi YK**, Turner AM, Kirchhoff K. Crowdsourced Evaluation of Medical Texts Simplified by Medical Trainees. Poster presented at American Medical Informatics Association (AMIA) Symposium. 15 November 2016; Chicago, IL.
- [3] **Choi YK**, Demiris G, Samuel A, Huang D. A Feasibility Study Examining Older Adult Needs within Smart Home Sensor Deployments. Oral Presentation at the Home Healthcare and Hospice Information Technology (H3IT) Conference. 11 November 2016; Chicago, IL.
- [2] **Choi YK**, Demiris G, Arjmand S, Danny H. Design guidelines for effective data visualization of sensor monitoring data. Poster presented at American Medical Informatics Association (AMIA) Symposium. 16 November 2015; San Francisco, CA.
- [1] Wang LL, **Choi YK**. Development of a discharge ontology to support postanesthesia discharge decision making. Poster presented at International Conference on Biomedical Ontology. July 2015; Lisbon, Portugal.

Peer reviewed Tutorials/Workshops/Panels:

- [1] Ozkaynak M, Valdez R, Demiris G, Novak L, **Choi YK**, Weir C. Innovation in Workflow Methods for Consumer Health Informatics. Panel presented at the American Medical Informatics Association (AMIA) 2017 Annual Symposium. 6 November 2017; Washington DC.

Book Chapters:

- [1] Ozkaynak M, Novak LL, **Choi YK**, Ashok R. Emerging Methods: Emerging Methods for Patient Ergonomics. In: Holden R, Valdez R. (Eds.) The Patient Factor: A Handbook on Patient Ergonomics Volume I.

INVITED PRESENTATIONS

- [10] **Choi YK**, Smart home and the Internet of Things (IoT): Application to Healthy Aging. Remote guest lecture for N398D: Methodological Topics for Designing Precision Health and Implementation Science Research for UT Austin School of Nursing PhD students, University of Texas Austin. 31 Mar 2022.
- [9] **Choi YK**. Qualitative and Mixed Methods: Smart Home Research Case Study. Guest lecture for MHI 289H: Research Design and Evaluation Methods in Health and Health Informatics for UC Davis School of Medicine Health Informatics Master's students, University of California Davis. 29 May 2021; Sacramento CA.
- [8] **Choi YK**. Consumer Connected Health. Guest lecture for MHI 210: Introduction to Health Informatics for UC Davis School of Medicine Health Informatics Master's students, University of California Davis. 1 Dec 2020; Sacramento CA.
- [7] **Choi YK**. Emerging Technologies to Support Healthy and Resilient Aging: Innovations for Aging in Place. Edson College of Nursing and Health Innovation, Arizona State University. 20 Feb 2020; Phoenix. AZ.
- [6] **Choi YK**. Smart Home Technologies to support Engaging with Aging: Facilitating patient work in their home environment. Research seminar co-hosted by Population Informatics Lab and Applied Cognitive Ergonomics Lab, Texas A&M University. 10 Dec 2019; College Station, TX.
- [5] **Choi YK**. Informatics and Personal Health Technologies to Support Aging in Place: Redesigning Home Care. Sinclair School of Nursing University of Missouri Columbia. 9 Oct 2019; Columbia, MO.
- [4] **Choi YK**. Technology to Support Aging in Place: Designing Tools for Older Adults and their Family Caregivers. Guest lecture at MHI 209 Consumer Digital Health class for UC Davis School of Medicine Health Informatics Master's students, University of California Davis. 8 May 2019; Sacramento CA.
- [3] **Choi YK**. Smartphone Applications to Support Sleep Self-Management: Review and Evaluation. Oral presentation at workshop "Social Media for Self-management in Patients with Chronic Conditions" Center for Innovation in Sleep Self Management & the de Tornyay Center for Healthy Aging, University of Washington. 20 April 2018; Seattle WA.
- [2] **Choi YK**. Usability Testing using a portable usability lab. Oral presentation at the Aging and Informatics seminar series School of Nursing, University of Washington. 2 February 2018; Seattle, WA.
- [1] **Choi YK**. Visualizing Smart Home Sensor Data for Older Adults. Virtual lecture at the Informatics Seminar of the Master's program at Universidad Peruana Cayetano Heredia (UPCH) in Lima-Peru. 30 June 2017.

RESEARCH GRANTS

Pending

Shih-Yin Lin and Yong Choi (co-PI)	10/1/22 – 09/30/23
Emory Roybal Center for Dementia Caregiving Mastery Leadership	Total Cost: \$114,876
"Development and Piloting of a Family-Centered, mHealth-Enhanced Intervention to Promote Caregiving Mastery in Detection, Prevention, and Management of Delirium Superimposed on Dementia"	

Received Noticed of Anticipated Award.

Current Research

Yong Choi (PI) 10/1/20 - 06/30/22
Healthy Aging in a Digital World Total Cost: \$100,000
Smart Home Platform for Aging Well (SHAW) using Voice Interaction and AI
Role: PI, wrote grant and oversaw study.

Completed Research

Yong Choi (PI) 10/16/19 - 10/15/21
UC Davis School of Medicine Mini Grant on Geriatrics Total Cost: \$4,000
Pilot Study to Assess Feasibility and Acceptability of
Smart Speaker Use to Support Medication Adherence
among Older Adults
Role: **PI**, wrote grant and oversaw study.

Katherine Kim, Kwan-liu Ma (multiple PIs) 4/1/19 – 6/30/20
CITRIS and the Banatao Institute Total Cost \$60,000
New Patient-centered Visualization Methods for Predictive Learning Algorithms: A Pilot
Study in Heart Failure Decision Support.
Role: Co-I, oversaw qualitative evaluation and analysis.

Katherine Kim (PI) 5/25/18 – 12/31/19
Amgen, Inc. Total Cost \$179,211
Understanding Educational Needs in Acute Lymphoblastic Leukemia
Role: Co-I, project management, data collection, and analysis.

Katherine Kim (PI) 5/25/18 – 11/30/19
Amgen, Inc. Total Cost \$195,337
Shared Decision Making in Multiple Myeloma
Role: Co-I, oversaw project management.

George Demiris (PI) 4/1/17-7/31/18
University of Washington School of Nursing-Research Total Cost: \$15,000
and Intramural Funding Program (RIFP) and de Tornyay
Center on Aging
Feasibility of Internet of Things Technologies to Support Aging.
Role: Co-I, oversaw project management, data collection, and analysis.

AWARDS AND HONORS

2019 **Best Interdisciplinary Research Award**
Aging and Health Informatics Conference 2019

2019 **GSA 2019 Diversity Fellow Travel Award**
The Gerontological Society of America Career Development Technical Assistance Workshop

2019 **Early Career Researcher Travel Award for Workshop Forming Science-Industry
Research Collaborations**

- Hosted by the Stanford Center on Longevity and Duke Center for Interdisciplinary Decision Science. Funding by National Institute on Aging (R25-AG053252)
- 2019 - 2020 Keller Pathway Fellow**
University of California Davis, Mike and Renee Child Institute for Innovation and Entrepreneurship
- 2019 - 2020 CITRIS Foundry Incubator Fall 2019 Cohort (Team: Fruitful Health)**
The program empowers top entrepreneurs from the University of California to build transformative companies that will have a significant impact on the world.
- 2018 GSA 2018 BSS Travel Award**
Behavioral and Social Sciences, the Gerontological Society of America
- 2017 ICHI 2017 Doctoral Consortium Travel Award**
International Conference on Healthcare Informatics
- 2017 UWRA Fellowship in Aging**
University of Washington Retirement Association awards a one-quarter fellowship that supports graduate students of outstanding academic merit who have a demonstrated academic and personal interest in aging-related issues or concerns.
- 2016 ICHI 2016 Graduate Student Travel Award**
International Conference on Healthcare Informatics
- 2015 GSFEI Graduate Student Travel Award**
University of Washington
- 2015 PhD Scholarship**
Washington State Health Information Management and Systems Society (WA HIMSS)
- 2013 Health Policy & Management Departmental Merit Scholarship**
School of Public Health, Texas A&M Health Science Center

RESEARCH EXPERIENCE

- 2019-2020 Kim Research Group**
Role: Postdoctoral Scholar
Lead: Dr. Katherine K. Kim
Responsibilities: Project management, conduct patient and caregiver interviews, conduct co-design sessions with patients, caregivers, and clinicians, mentor graduate students
- 2017-2018 The Center for Innovation in Sleep Self-Management (CISSM)**
(<https://cissm.nursing.uw.edu/>)
Role: Graduate Research Assistant
Supervisor: Dr. George Demiris, Dr. Hilaire Thompson
Responsibilities: Informatics framework and methodology review and consultation, literature reviews
- 2015-2017 Studying Older Adults & Researching Information Needs and Goals (SOARING)** <https://www.soaringstudy.org/>
Role: Graduate Research Assistant
Lead: Dr. Anne M. Turner
Responsibilities: Data management and analysis, design surveys, literature reviews, manuscript preparation

- 2014-2018 **Home-based Environmental and Assisted Living Technologies for Healthy Elders (HEALTH-E)**
 Role: Team Member / Graduate Research Assistant
 Lead: Dr. George Demiris, Dr. Hilaire Thompson
 Responsibilities: Recruit and interview subjects, data management and analysis, literature reviews, manuscript preparation
- 2014 Summer **Population Informatics Lab**
<https://pinformatics.org/index.php>
 Role: Graduate Research Assistant
 Supervisor: Dr. Hye-Chung Kum
 Responsibilities: Research public health data visualization techniques, literature reviews, manuscript preparation

TEACHING EXPERIENCE

- 2021 Spring School of Medicine University of California Davis
MHI 209N: Consumer Digital Health
Role: Instructor
 The course explores the landscape, technologies and policies involved in digital and connected health. The course will explore different models of digital health data monitoring, including clinical, mobile health and telehealth, and focus on the design, acquisition and analysis of data in the personal and consumer health ecosystem.
- 2022 Winter School of Nursing, University of California Davis
NRS 212: Technology and Innovation in Healthcare
Role: Instructor
- 2021 Winter **NRS 212: Technology and Innovation in Healthcare**
Role: Co Instructor with Dr. Philippe Goldin
- 2020 Winter **NRS 212: Technology and Innovation in Healthcare**
Role: Co-Instructor with Dr. Katherine Kim
 This interprofessional course on technology and innovations in health care will incorporate a multidisciplinary approach including nursing, medicine, social and behavioral sciences, as well as information technology and engineering perspectives to stimulate new thinking in the practice, process, and delivery of health care.
- 2014 Spring School of Public Health, Texas A&M Health Science Center
PHPM 672: Data Science for Health Services Research
Role: Graduate Teaching Assistant
 Instructor: Dr. Hye-Chung Kum
 This course introduces multidisciplinary approaches to conducting health services research. Course focuses on both primary and secondary data analysis for the purpose of understanding the quality and effectiveness of various health delivery systems and the policy implications for the health of citizenry.

Graduate Student Independent Study

Graduate Student Independent Study	Role	Quarter
Salhah Alomairi (MS in Health Informatics) – 4 units	Instructor of Record	Spring 2022
Kevin Cody (MS in Health Informatics) – 4 units	Instructor of Record	Spring 2022
Prakriti Sarkar (MS in Health Informatics) – 3 units	Instructor of Record	Spring 2022
Salhah Alomairi (MS in Health Informatics) – 4 units	Instructor of Record	Winter 2022
Prakriti Sarkar (MS in Health Informatics) – 1 unit	Instructor of Record	Winter 2022
Neha Singh (MS in Health Informatics) – 4 unit	Instructor of Record	Fall 2021
Jiyeong Kim (PhD in Public Health Sciences) – 2 unit	Instructor of Record	Fall 2021

Mentoring

Students	Mentoring Role	Dates	Current Status
Undergraduate Students			
Urmi Lalchandani Shivani Parekh Gem Gasca Lucas Rodriguez	CS Senior Design team Mentor (ECS 193A): Project Title: Leveraging Social Media for Family Caregiving Research	2022- current	
Alejandro Estrada Mauricio Rojas Morales Andrey Yakymovych Anastasia Belenkii	CS Senior Design team Mentor (ECS 193A) Project Title: Smart Home for Aging Well	2022- current	
Master's Students			
Davis Gayda	Graduate Student Researcher Mentor	2021- current	
Kevin Cody (MS in Health Informatics)	Thesis Chair	2022- current	
Salhah Alomairi (MS in Health Informatics)	Thesis Chair	2021- current	
PhD Students			
Jiyeong Kim (PhD in Public Health Sciences)	Graduate Student Researcher, Research rotation mentor (SPH 292), and Health Data Science Fellowship mentor	2020- current	
Melissa Pighin(PhD in Public Health Sciences)	Graduate Student Researcher, and Research rotation mentor (SPH 292)	2020- 2021	
Sayantani Sarkar (PhD in Nursing)	Mentored manuscript development	2019- 2021	Postdoctoral Scholar, School of Medicine, UC Davis

SERVICE

Committees	Aging Initiative Research Committee , UC Davis (2021-) Graduate Group in Health Informatics , UC Davis (2020-) Graduate Admissions Committee, Biomedical and Health Informatics, University of Washington (2016-2017)
Reviewer	Journal of Medical Internet Research (2020-) Advanced Methods Conference: Sensor Technology in Research (2019) International Journal of Medical Informatics (2015, 2016, 2019) American Medical Informatics Association (2017-) The Gerontological Society of America (2018-) Journal of Applied Gerontology (2017, 2018, 2019) Informatics for Health and Social Care (2018, 2019)
Member	American Public Health Association (2021-) American Medical Informatics Association (since 2015) Consumer Health Informatics Working Group (CHI-WG) <ul style="list-style-type: none"> • Student liaison (2016-2018) • Student paper award co-chair (2018,2019) • Secretary (2020-2021) The Gerontological Society of America (since 2015) Healthcare Information and Management Systems Society (2012,2014-2017) Medical Group Management Association (2012-2014)

MEDIA COVERAGE

Q13 FOX (KCPQ). Smart homes could keep seniors living independently longer. (May 25, 2017) Retrieved from <https://q13fox.com/2017/05/25/smart-homes-could-keep-seniors-living-independently-longer/>

University of Washington Be Boundless Campaign. Creating Safer, Smarter Homes. (May 2017)
Retrieved from <https://www.washington.edu/boundless/nursing-smart-home/>