Preamble

Welcome to the first Design4Health Conference in Australia, convened by the Centre for Design Innovation, Swinburne University of Technology, on behalf of, and jointly chaired with, the conference founders, Lab4Living, Sheffield-Hallam University, UK.

The Centre for Design Innovation investigates and validates the key factors that underpin the design of products, services, systems, spaces, and symbols to improve the chance of user uptake and impact.

Lab4Living, who established the conference, is an interdisciplinary research initiative that develops products and environments, and proposes creative strategies for dignified, independent and fulfilled living for all.

This international event invited the world of health and design practitioners and researchers to come together between the 4th and 7th of December, 2017 in Melbourne, Victoria, Australia.

About the conference

Design4Health is an international conference that brings together designers, health professionals and creative practitioners with researchers, clinicians, policy makers and users from across the world to discuss, disseminate and test their approaches and methods in the ever-changing nexus between design and health.

The conference hosted a series of different events that provided an active forum to explore how the disciplines of design and health might intersect to bring forth new ways of thinking and working in what is a dynamic, innovative and increasingly important area of research and practice. The central question has been:

How can we work together to achieve positive and sustainable impact on the social, economic and cultural factors within our communities and beyond?

The range and insights presented at the D4HMelbourne event has revealed both the enormous value of this movement in research, and the benefits from undertaking serious, applied, and critical efforts that design and health expertise generate when they come together.

We invite you to browse the innovative ideas and critiques scoped in these proceedings

Sincerely

Associate Professor, Kurt Seemann, PhD. | Convenor | Design4Health 2017
Supporters and Partners

Cabrini Hospital
Centre for Design Innovation, Swinburne University of Technology, Australia.
Faculty of Health, Arts and Design, Swinburne University of Technology, Australia.
Jean Hailes for Women's Health
Lab4Living, Sheffield-Hallam University, UK.
Melbourne Cricket Ground, Melbourne.
Ms Sarah Markey-Hamm and Ms. Siobhan Bahn, Conference Managing Agents, ICMS.
Peter Stacey, Human Scale

Acknowledgments

Many people have contributed their time and skills to assist the 2017 International Design4Health Conference in Melbourne, Australia, and the compilation of the proceedings. We wish to personally thank and acknowledge the work by Associate Professor Deirdre Barron, (Chair, Academic Review Board), and the boards two executives, Dr Alen Keirnan, and Dr. Nicole Aimers. Also wish to thank the work of:

Ms. Fatma. Mohammed, and Ms Andrea Streckfuss (Centre Coordinators, Centre for Design Innovation, Swinburne University of Technology).
Ms. Jenny Jiang (Project Management Intern)
Associate Professor Simone Taffe (Design4Health Melbourne Exhibition)
Ms. Bridgette Engeler (Design4Health Melbourne Exhibition)
Dr. Gianni Renda (Design4Health Melbourne Exhibition)

Conference Convenor and Co-Chairs

Associate Professor Kurt Seemann (Convenor, Co-Chair)
Director, Centre for Design Innovation, Swinburne University of Technology
Professor Paul Chamberlain (Co-Chair)
Director, Lab4Living, Sheffield-Hallam University

Academic Program and Review Committee

Associate Professor Deirdre Barron
(Chair, Academic Program and Review Committee, 2017)
Dr Nicole Aimers
Dr Alen Keirnan
Research Associate Kirsty Christer
Mr. Heath Reed
Associate Professor Flavia Marcello
Associate Professor Carolyn Barnes

All papers included in these proceedings have been double-blind refereed by peers and revised to take into account the referees’ recommendations.

Citation for Proceedings


Citation for Paper in Proceedings (format)


COPYRIGHT

© 2017 Sheffield Hallam University jointly with Swinburne University of Technology

Attributions: Creative Commons: https://creativecommons.org/licenses/by/4.0/

Lab4Living | Art & Design Research Centre | Sheffield Hallam University | Sheffield | S1 1WB | tel: +44 (0) 114 225 6918 | fax: +44 (0) 114 225 6931 | www.design4health.org.uk

Centre for Design Innovation | Swinburne University of Technology | Johns Street | Hawthorne | Victoria | 3122 | Australia | tel: +61 3 9214 8000 | www.cdiengage.com.au
# Table of Contents

1. **The role of users in an innovative service design process in healthcare**
   Alhonosuo, M. and Miettinen, S.

2. **Learning critical communication in social services: Innovations in communication practices and technologies through simulation pedagogy and service design**
   Vuojärvi, H., Alhonosuo, M., Marttila, H.

3. **Foyle Bubbles: How can design reduce suicide attempts using everyday social and civic spaces?**
   Alwani, R., Raby, E., West, J., Bichard, J. and Spencer, J.

4. **How do space and information technology affect patients’ waiting experience in an ambulatory centre?**
   Annemans, M., Stam, L., Coenen, J. and Heylighen, A.

5. **When interest pays off: The relationship between motivation, wellbeing and learning of technologies by older adults**
   Beh, Jeanie and Sonja Pedell

6. **Fit for purpose**
   Bell, Alison

7. **Design standards and disability: Limitations in person-centred home modifications**
   Lo Bianco, Michael, Sonja Pedell, Gianni Renda, and Ajay Kapoor

8. **The prototyping process of a patient support device for radiotherapy of breast and regional lymph nodes in prone position**
   Boute, Bert, Wilfried De Neve and Jan Detand

9. **Wardrobe Adapted for Wheelchair Users**
   Bruckner, Melanie Sol, Gabriela Elise Fensterseifer, Gustavo Henrique Lagemann, Silvia Trein Heimfarth Dapper

10. **Delivering healthcare: A reframing tool to uncover the right problem to solve.**
    Cockburn, Jane and Clementine Thurgood

11. **Design Anthropology and the medicalisation of ageing: Reflections on Designing for mild cognitive impairment**
    Collier, G., Kayes, N., Reay, S., Hayes, N. and Bill, A.

12. **Giving people living with dementia a strong voice: reflecting on the role of design to create enabling activities**
    Claire, C. and Pedell, S.
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>Discourse and collaborative design: exploring a critical approach to community engagement for design research insight</td>
<td>Cunningham, Helen J., Joanna K. Fadyl, Stephen D. Reay and David E. White</td>
</tr>
<tr>
<td>71</td>
<td>Design for health: Experience of women-based food innovation initiative to overcome nutrition related health issues in Sri Lanka.</td>
<td>De Silva, S. and Akane, M.</td>
</tr>
<tr>
<td>74</td>
<td>Co-designing to understand the tracheostomy product experiences of long-term tracheostomy users.</td>
<td>Dickson, C., Reay, S.D., Douglas, R. and Nakarada-Kordic, I.</td>
</tr>
<tr>
<td>79</td>
<td>The refuge project: Designing through health, architecture and landscape</td>
<td>Donnelly, Samantha, Sue Dean, and Tracy Levett-Jones</td>
</tr>
<tr>
<td>83</td>
<td>Prototyping an emotionally responsive hospital environment</td>
<td>Douglas, R., Reay, S.D., Munn, J. and Hayes, N.</td>
</tr>
<tr>
<td>88</td>
<td>Designers and hospitals: Considerations from an ongoing collaboration</td>
<td>Daphne Flynn, Kate McEntee, Rowan Page and Troy McGee</td>
</tr>
<tr>
<td>91</td>
<td>Strategic design innovating wellness for the 21st Century workforce</td>
<td>Fry, A. and Alexander, R.</td>
</tr>
<tr>
<td>99</td>
<td>Integrating responsive design and interdisciplinarity for healthcare environments</td>
<td>Haskell, N. and Loy, J.</td>
</tr>
<tr>
<td>103</td>
<td>Interdisciplinary and cross-cultural approaches to design for healthy ageing</td>
<td>Scharoun, Lisa, Danny Hills and Carlos Montana Hoyos</td>
</tr>
<tr>
<td>106</td>
<td>The impact of user experience on simulation or VR-based training software in the field of medical surgery and teaching environment.</td>
<td>Hilgers-Yilmaz, Ute</td>
</tr>
<tr>
<td>110</td>
<td>Can you have your cake and eat it too? A dilemma-driven approach to design for the early stages of health behaviour change</td>
<td>Ludden, Geke, Deger Ozkaramanli and Armağan Karahanoğlu</td>
</tr>
<tr>
<td>115</td>
<td>Wellbeing and the lived experience of dying with dementia in a typical Australian RACF</td>
<td>Armağan Karahanoğlu</td>
</tr>
</tbody>
</table>
26. **Design for dementia: Making spaces for uncertainty**
   Fennell, Jac,¹ Cathy Treadaway² and Gail Kenning³

27. **Craft as purpose: Co-design for people living with advanced dementia**
   Kenning, Gail,¹ Cathy Treadaway,² Jac Fennell,³ David Prytherch⁴ and Andy Walters⁵

28. **Reciprocal design: inclusive design approaches for people with late stage dementia**
   Kenning, Gail

29. **QuittyLink: Involving smokers in the design of technology that supports individuals in quitting**
   Paay, Jeni,¹ Jesper Kjeldskov,² Uma Brinthaparan,³ Lars Lichon,⁴ Stephan Rasmussen⁵ and Nirojin Srikandaraja⁶

30. **Communication design project: Redesigning medicine administration for the elderly in Hong Kong**
   Kwok, S.H.

31. **Thick care: Designing for an ethic of care and complexity in community aged care services**
   Lorenzetto, Anna

32. **Creating a personalised self-management system for post stroke rehabilitation; utilising a user-centred design methodology**
   Mawson, Susan,¹ Nasrin Nasr,² Jack Parker,³ Huiru Zheng,⁴ Richard Davies⁵ and Gail Mountain⁶

33. **Designing for emergency departments: A literature review**
   McGee, T., Flynn, D., Coxon, S. and Keith, J.

34. **Kids in the waiting room: Lessons from Melbourne’s Royal Children’s Hospital**
   McLaughlan, R., Willis, J. and Sadek, A.

35. **Evidence and borrowing: Conversations with 8 architects on the use of evidence and innovation in the design of contemporary healthcare facilities**
   McLaughlan, Rebecca, Philip Goad, and Alan Pert

36. **ICU journey: Humanising the patient experience of Intensive Care**
   Meldaikyte, G., Fusari, G., Matthews, E. and West, J.

37. **Designing creActivities: Creative Methods to engage young people experiencing psychosis in co-design**
   Nakarada-Kordic, Ivana,¹ Nick Hayes,² Stephen D. Reay,³ Carla Corbet⁴ and Amy Chan⁵

38. **Responsive tangible rewards in physical activity gamification**
   Novak, James I.¹ and Jennifer Loy²
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>Design across the Spectrum: Enhancing inclusion for children on the autism spectrum in the playground</td>
<td>171</td>
</tr>
<tr>
<td></td>
<td>Owen, Ceridwen, Damhnat McCann, Christopher Rayner, and Jackson Wells</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Increasing confidence through competence in people with dementia through meaningful conversations</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td>Paay, Jeni,¹ Metta Bank² and Ivan Aaen³</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Interactive technologies helping young adults manage low self-esteem</td>
<td>179</td>
</tr>
<tr>
<td></td>
<td>Paay, Jeni,¹ Helle Larsen² and Heidi Nielsen³</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>The SEE toolkit: How young adults manage low self-esteem using personal technologies</td>
<td>183</td>
</tr>
<tr>
<td></td>
<td>Paay, Jeni,¹ Helle Larsen² and Heidi Nielsen³</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Speculative co-design: a framework for designing medical devices towards enhanced usability, through explorations of experience.</td>
<td>187</td>
</tr>
<tr>
<td></td>
<td>Rowan Page</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Utilising Lego® Serious Play® to engage children and young people with ADHD and their parents</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td>Powell, L.¹, Parker, J.,² Harpin, V.,³ and Mawson, S.⁴</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Enhancing social connections amongst older residents of a rural town with community mapping and technology</td>
<td>195</td>
</tr>
<tr>
<td></td>
<td>Paulovich, Belinda</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Technology in health and social care: a critical reflection from across two continents</td>
<td>198</td>
</tr>
<tr>
<td></td>
<td>Pedell, S.¹ and Claire, C.²</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Pictorial Language: A bridge to meaningful conversation between grandparent and adolescent grandchildren</td>
<td>202</td>
</tr>
<tr>
<td></td>
<td>Mayasari, Angeline and Sonja Pedell</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>The hospital environment through the eyes of adolescents with long-term patient experience. Young people affected by cancer speaking</td>
<td>207</td>
</tr>
<tr>
<td></td>
<td>Peeters, Kimberl, Pleuntje Jellema, Margo Annemans, and Ann Heylighen</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Communicating information in health: Engaging students in design for health awareness.</td>
<td>211</td>
</tr>
<tr>
<td></td>
<td>Potter, E., Reay, S.D. and Thornhill, B.</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Stigma and the weight it carries when establishing a user experience Strategy: User research discoveries around mobility related issues</td>
<td>215</td>
</tr>
<tr>
<td></td>
<td>Neagu, E., Raby, E. and McGinley, C.</td>
<td></td>
</tr>
</tbody>
</table>
51. Foyle Reeds: How can design reduce suicide attempts at a specific place whilst at the same time improving the experience for all?  
   Raby, E., Alwani, R., West, J., Bichard, J. and Spencer, J.  

52. Design for well-being: Examining Aceh post-tsunami houses  
   Rahmayati, Y.  

53. Dear pelvic floor exercises: A qualitative study among health professionals, pregnant and postnatal women  
   Barnard, R., Rodriguez Ramírez, E.R., Caudwell, C. and Baartman, V.  

54. NZ Fauna AR: an augmented reality exergame system to assist stroke survivors with independent rehabilitation.  
   Petrie, R., Rodriguez-Ramirez, E. and Chan, K.  

55. Exergames for healthy ageing: Inclusion through design  
   Čaić, Martina,1 Vanessa Rodrigues,2 Stefan Holmlid,3 Dominik Mahr4 and Gaby Odekerken-Schröder5  

56. Psychosocial Needfinding  
   Savig, E.S.1 Gurevitch, J.H.,2 Jackson, J.E.,3 Alinowski, A. Agarwal-Hashmi, R.,4 Sourkes, B.M.,5 Cohen, H.J.6 and Leifer, L.J.7  

57. Review of waste management service design for health and wellbeing in rural and remote Aboriginal and Torres Strait Islander communities  
   Seemann, K., McLean, S. and Fiocco, P.  

58. Designing innovative wayfinding systems in healthcare: from exploratory prototyping to scalable solutions  
   Short, E., Reay, S.D., Douglas, R.  

59. Designing health information to an acceptable standard: the state of the art, science craft, and design  
   David Sless  

60. Sharing the city: An intergenerational VR experience  
   Symington, Nicole, Kathy Constantin, and Sonja Pedell,  

61. Reimagining ageing: Insights from teaching co-design methods with designers, seniors and industry partners  
   Taffe, Simone,1 Sonja Pedell2 and Andrea Wilkinson3  

62. Taking the pulse: A survey of design for health development in Singapore  
   Koon Boon Tan, Michael  

63. Framing food literacies: Reflections from two Australian design-led innovation projects  

---

64. Research-led Design of a Communication Strategy for a Health Accelerator Program
   Turukalo, M., Thompson, J., Pedell, S. and Kommatas, C.

65. Making better use of recorded patient experiences: transforming literature into a collaborative tool for inspired interaction
   Villalba, C., Jaiprakash, A., Donovan, J., Roberts, J. and Crawford, R.

66. Designing for health beyond healthcare: From the institutional assumption to community health design
   Vink, Josina, W. and Hendriks, N.

67. Designing emotionally resonant aesthetic experiences in healthcare.
   Wan, T., Reay, S.D., Smith, A., Douglas, R.A.

68. Evaluation of universal design—A scoping project
   Watchorn, Valerie., Cathryn Grant, Richard Tucker, Danielle Hitch, Patsie Frawley, Susan Ang, and Kathryn Aedy

69. Decreasing the burden of hypertension: A design intervention to foster more accurate blood pressure measurements.
   Jackson Wells, Ceridwen Owen, James Sharman, Niamh Chapman, and Rebekah McWhirter

70. Developing the Double Diamond process for implementation—insights from a decade of Inclusive Design projects

71. SlowMo/Mo—digital technology to provide support in coping with daily life
   West, J., Wojdecka, A. and Matthews, E.

72. Co-creating a digital decision aid for people with dementia and their caregivers to fulfil their unmet needs
   Van Zuthem, H.M., Cila, N. and Wildevuur, S.E.

73. Designing Information and Communication Technologies to support chronic disease self-management in practice: a case study from Australia and the Netherlands
   Wildevuur, Sabine E., Fleur Thomese, Julie Ferguson and Ab Klink

74. What we wish we had known when we began: Insights on designing together with people with dementia in research and education
   Wilkinson, A. and Hendriks, N.

75. Violence, vulnerability, and care: A women’s history of HIV in America
   Matthew Wizinsky
76. Using Knowledge Mobilisation theory to inform the design of a co-design workshop for healthcare research and innovation
   Joe Langley, Dan Wolstenholme, Rebecca Partridge, Ian Gwilt

77. Improving the blood donation experience through better designed phlebotomy.
   Wood, Caitlin and Selby Coxon,

78. Actualising the participant designer: a case study in the design of health communications
   Barnes, C., Wragg, N. and Wragg, L.

79. Playscapes: Pure Ludens
   Yan, J., Hedges, S., Reay, S.D.

80. Strength for task training (STT) exergaming for lower limb stroke rehabilitation
   RuiFeng Yeo and Edgar R. Rodríguez Ramírez
ICU journey: Humanising the patient experience of Intensive Care

Meldaikyte, G., Fusari, G., Matthews, E. and West, J.

Royal College of Art, United Kingdom

Keywords

Intensive Care, humanising patient experience, personalising patient experience, patient care, Orientation.

Introduction

Intensive Care Units (ICU) are spaces designed to look after patients with life threatening conditions; they provide life-support, extensive therapies and continuous monitoring aiming to preserve life and return patients to good health. Despite this, the mortality rate is high (Critical Care Statistics. 2017). The clinical intensity and invasiveness of this highly medicalised and technology-dependent environment can be intimidating and threatening for patients. Moreover, the patient’s physical and mental condition—compounded by medication—can make them vulnerable to disorientation, sleep deprivation and hallucinations, the effects of which remain with the patient long after their medical recovery. Ensuring that people have a positive experience of care is one of NHS England’s National Outcomes Framework key domains. Achieving this is a challenge in most ICUs (Framework Domains. 2017).

Working in partnership with four hospitals in England, we have co-developed a tablet-based application—called Senso—aiming to reduce the psychological effects of Intensive Care by enabling clinicians, carers and patients to personalise some aspects of their environment.

Background

The collaborative team of designers and clinicians have undertaken a 24-month long project looking to improve the experience of patients and relatives in ICU. The project laid out the foundations for a new scalable solution aiming to address some of the major problems experienced by patients going through ICU.

Drawing from previous research and anecdotal evidence from staff and patients at the participating hospitals, the starting point for the research team was to bring balance between the heavily medicalised ICU environment and the basic, yet complex, emotional needs of patients and carers.

Research shows that a great number of patients suffer from hallucinations and delirium, leaving them in a state of confusion and disorientation, exacerbated by the difficulty they have in sleeping; noisy and often over-lit wards make matters worse (Avinash Konkani, Barbara Oakley 2012, 522.e1–522.e9). It is well documented that a high
percentage of patients suffer from psychological disorders even years after being discharged from ICU (Post-traumatic stress disorder after intensive care. 2013).

**Methods**

The project was structured around the ‘Double-Diamond’ framework—a research and design methodology involving four stages of divergent and convergent thinking (Design Council. 2005)—and divided into two 12-month phases.

During the first 12-month phase, the team performed primary research in four hospitals in England. The team developed an understanding of the problem from the point of view of different stakeholders including patients, relatives and clinicians. Findings were clustered in ten areas:

1. Orientation
2. Sleep deprivation
3. Motivation
4. Anxiety
5. Involvement of relatives
6. Dignity
7. Communication
8. Boredom
9. Hallucinations
10. Senses

Further analysis through co-design workshops distilled three design questions:

**Positive sensory disruption:** How might we stimulate the patient’s senses in a positive way in order to help reduce the incidence of hallucinations and delirium, and improve the overall experience of the ICU journey?

**Orientation:** How might we help patients overcome disorientation and confusion and establish a personalised routine that draws insights from their preferences and normal activities, supported by relatives and staff?

**Information and space utilisation:** How might we help carers and relatives better navigate the ICU environment and understand the key role they might play in delivering care for patients?

Guided by the experience of a steering group, the second phase of the project explored creative solutions to answer the briefs. Through co-design workshops involving a ICU Patient Support Network Group, the team prototyped and tested ideas. After two cycles of iteration, requirements for a minimum viable product were outlined.

**Outcome**

The outcome is a digital application that provides a personalised sensory experience for the patient named Senso. The first version has been designed for patients going through...
planned admissions; future development will focus on the more challenging needs of emergency patients.

To initiate Senso, patients go through an onboarding process preoperatively; this includes the selection of images, sounds and smells that will be made available to them in the ward. A key objective of this process is to help patients understand the ICU environment prior to admission.

After onboarding, Senso generates a moodboard from the selected images and videos. This not only provides a familiar view for the patient but can also help staff to engage personally with the patient. A daily schedule helps relatives understand the patient’s day-to-day activities and progress. Furthermore, Senso provides patients with a daily routine, supporting them through their journey from leaving the operating theatre through to the point of discharge from ICU. Our hypothesis is that by providing structure to the patient’s day we will help in orientation and engagement.

**Results**

Feedback sessions were conducted with ten patients (5 females and 5 males) staying in ICU between 24 hours and 7 days. Sessions consisted of a structured questionnaire about their current ICU experience followed by a demonstration of the application. Responses were encouraging, patients thought Senso may improve their stay by reducing anxiety and providing better orientation. An additional focus group session with five participants aimed to evaluate the onboarding process. The session was further informed by a structured questionnaire, which helped to draw key insights for the next phase of development.

**Next steps**

Initial testing indicates that Senso has potential to improve outcomes. Our work has been recognised with the Environment of Care Award in the 2017 Patient Experience Network National Awards. The team now aims to perform wider testing and improve the application. A route for testing will be to make Senso available to the wide network of ICUs that have shown interest in our research so they can offer it to their patients. Further funding is being sought for this and to develop a version for emergency admissions.

**References**

http://www.sccm.org/Communications/Pages/CriticalCareStats.aspx.

