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Citation for the original published paper (version of record):

Eriksson, J., Lad, H., Lindahl, G. (2024). Rethinking Day Surgery Model of Care and Built Environment: A Design Dialogue Study. *The Evolving Scholar | ARCH22*.  
<http://dx.doi.org/10.24404/623afbb69bc8a11624b8e7f6>

N.B. When citing this work, cite the original published paper.

Type of the Paper: Peer-reviewed Full Paper

Track title: Topic 3 Engagement – co-creation, co-design, design and stakeholder management processes

# Rethinking Day Surgery Model of Care and Built Environment: A Design Dialogue Study

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**Journal:** The Evolving Scholar

**DOI:**10.24404/623afbb69bc8a11624b8e7f6

**Submitted:** 23 Mar 2022

**Accepted:** 22 August 2022

**Published:** 11 June 2024

**Citation:** Eriksson, J. & Lad, H. (2022). Rethinking Day Surgery Model of Care and Built Environment: A Design Dialogue Study. *The Evolving Scholar* | ARCH22.

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## Abstract:

Day surgery is an expanding service, yet in many cases the current built environment is based on the general surgical department, with access to day bed wards, and has changed very little since the 1950s in the UK. In December 2019, a one-day workshop was organised to investigate the future concept of day surgery services and explore the spatial provisions. The event consisted of a range of stakeholders from government, practice, and academia involved in healthcare environments. A design dialogue methodology was implemented, exploring the 'ideal model of care' through a series of activities using words, images, and free association from user experiences. A design game, using tangible materials, lets the participants develop and build visual proposals of new surgical environments. The workshop outcome was further processed through the identification, sorting, and coding of key themes for improvement, such as user experience, logistics, adaptable design, aftercare, and recovery. By defining high and low parameters of patient experiences, a number of topics were discussed, including social community systems, information awareness, safety and wellbeing, continuity of patient pathways, as well as the efficiency and effectiveness of staff. The final design game combined the themes and topics, further deepening the insights.

The use of a variety of design dialogue methods combined perspectives and knowledge, and the workshop clearly identified the value and impact of interdisciplinary collaboration in deliberating and exploring ideas for future healthcare facilities.

**Keywords:** day surgery; co-design; design dialogue; health care design;

## 1. Introduction

The surgical department's basic spatial layout has changed very little since the 1950s in the UK; the setup of an operating suite remains the same, with only variations in room sizes. In the 21st century, advances in medical technology and the range of services available for routine procedures have progressed at a rapid pace. Day surgery is now a common and expanding service, providing efficiencies in patient, staff, and service outcomes. The layout and concept behind the day surgery facilities remain unchallenged, as embodied in the historical design of the general surgical department.

This study looks at how the spatial perspective could be used to connect organisations, healthcare services, and physical environments. Studies show that complex design

challenges need to be addressed in an iterative collaborative manner, and in the exchange between different perspectives and knowledge fields, new and innovative ideas emerge and solutions are explored.

In December 2019, a one-day workshop was organised at UCL to rethink the concept of day surgery using an innovative method. The event was part of a series of design-driven workshops in Sweden, Germany, the UK, and the Netherlands as part of the BauHow5 Alliance, involving knowledge triangle stakeholders and sharing and co-creating knowledge about health and healthcare facilities in real-world, locally situated problems. The overall project also sets out to support public administration in implementing academic knowledge and create new business possibilities for architects and designers (Eriksson et al., 2020).

Design dialogue is described as “a method developed and used in workplace development in Sweden. The model brings knowledge from different actors and disciplines into a process of producing joint knowledge concerning a current issue in the built environment.” (Eriksson et al., 2020). The model is artifact-driven, which entails the creation of visual concepts with a shared understanding.

The model was here implemented in a new context as an explorative tool for stakeholders not usually meeting and discussing the topic of day surgery together. The model was used to see if things usually not discussed would emerge. Design dialogues are both a method for developing new knowledge and the object of study for this paper.

Based on the approach of collective sharing of knowledge and experience, a group of professionals from different backgrounds linked to healthcare facilities came together to question the current UK environment for day surgery and create a future model of care that could reflect current user needs.

This study relied on the subject and the investigation method. This paper aims to present how this approach could be applied in a different context, the type of knowledge it would generate, and the key factors that affected the outcomes. Further discussions and refinements on the design dialogue method and its application to healthcare environmental design are considered.

## 2. Theories and Methods

With its base in 70's and 80's collaborative workplace design (Adler, Granat, and Lindahl, 1995), the design dialogue was developed and implemented both in research and practice in relation to healthcare building design in Sweden (Fröst, 2004; Eriksson, 2013). The experiences of the method were further elaborated (Fröst et al., 2017) and form the basis for the method implemented in this study. Design dialogues are described as workshops where participants iteratively explore possibilities and ideas, designing a series of prototypes using drawings, words, and a selection of tangible materials, including different-shaped and coloured cardboard forms and sheets of paper. These prototypes became design artefacts, working as carriers of collective discussion, investigations, and creative insights. The model uses design as a tool for people, both designers and non-designers, to describe and develop ideas collaboratively.

### 2.1 The Workshop

As part of a series of workshops developed by the BauHow5 Alliance team and used in other countries, a tried-and-tested model and procedure were applied. The researchers and authors of this paper planned, facilitated, and participated in the workshop, making it an action-based study. The study included the setup of a co-design workshop where observations, videos, and photographic documentation were complemented with a questionnaire focused on the data collection methods. The recorded material, results, and outcomes were sorted and reflected upon in the process of writing an initial summary report and then this paper.

The workshop's basic principles were to start with individual reflections and then move on to group work and collective processing. This would enable participants to air their personal concerns and then form joint concepts through collective learning. Smaller groups presenting to the whole group would initiate an upscaling of knowledge sharing and understanding. Participants changed groups from one session to another to avoid personal or hierarchical "locking" and enhance the spread of different perspectives. The use of the same visual tools and tangible materials enables a variety of expressive illustrations of ideas and concepts. (Fröst et al., 2017).

Table 1: Workshop Structure, tools and outcomes.

<b>Workshop Structure</b>	<b>Tools</b>	<b>Outcomes</b>
<b>Introduction</b> overview	Power point presentation to participants.	Basic understanding of design methodology and aims of workshop.
<b>Session 1, Brain-storm</b> Q: What are your main concerns about current UK facilities for day surgery, with reference to activity space and service delivery?	Participants individually wrote key words on different coloured post-it notes.	Individuals selected two key words to presented to the whole group for discussion. Warm up exercise to encourage people to voice opinions and overcome shyness.
<b>Inspirational input</b> Short lecture on the design history of day surgical spaces by host.	Power point presentation and short video of user experience.	Provoke further thoughts and conversation.
<b>Session 2, Patient experience</b> Q: What is the experience or impression with which the patient should leave the day surgery facility with? What is the ideal? Present three most important concepts.	Participants split into small groups of 5-6 people. Given coloured paper, pens and assorted images stamps.	Each group synthesized the information onto three cards each with a single sentence and image to describe experience/ impression to be conveyed and presented to the whole group. A series of themes and concepts began to emerge.
<b>Lunch</b>	Lunch provided in workshop room.	Generated further conversation in smaller groups.
<b>Session 3, Design Game</b> Q: By rethinking the surgical space for day surgery, what would the ideal 'model of care' be? Build a concept design.	Participants allocated into small groups of 5-6 people by host and given an A1 white board, a selection of shapes, colours, adhesive and images.	Each group developed a concept design and presented to the whole group, followed by Q&A session.

## 2.2 Participants

Participants were invited by the hosts to represent a range of stakeholders involved in the planning and design of healthcare environments. These included healthcare professionals, clinicians, architects, designers, contractors, artists, and researchers in healthcare services. Participants were mainly from the UK; others included researchers from the Netherlands and Sweden.

## 3. Results and Summary of Workshop Outcomes

The study revealed two sets of distinct outcomes. The first set related to the topic of rethinking day surgery, and the second to the process and method by which the study was conducted. This section provides a summary of the workshop outcomes, key themes discussed in relation to day surgery facility design, and an analysis of the questions posed on a methodology questionnaire. The interpretation and significance of these outcomes are explored in the discussion.

### 3.1 Participants

The total number of attendees was 24; this included the organisers who participated in the day's event. When categorised into different professions, several of them held dual or triple roles, which provided a spectrum of different viewpoints. All of them were patients (n = 24).

Table 2: Participants

Profession/ Background	Number related to roles	Dual/ triple roles
Clinical Professionals	3	No
Architects	13	Yes
Healthcare Planners	10	Yes
Design Managers	1	No
Academic Professors	3	Yes
Senior Lectures	3	Yes
PhD Researchers	4	Yes
Commercial Artist	1	No

### 3.2 Session 1: Brainstorm outcomes, main concerns

The task produced a list of key words that described participants concerns with current daycare services. The key words are here summarised into common themes, which were:

- Communication is lacking.
- Need for better organisation and efficiency.
- Importance of user experience for both staff and patients.
- The need for empathetic design.
- The ability to adapt and flex spaces.
- Overcoming inefficiencies in space, environment, services, and workforce.



Figure 1: Workshop, brainstorm material

### 3.3 Session 2: Patient experience outcomes

In small working groups of 5–6 participants, conversations centre on the ideal experience and impressions that surgery could provide. Through discussion and deductive reasoning, each group selected only the three most important concepts, using a phrase and an image for each concept.

Table 3: These themes emerged from debate and agreement as part of the larger group discussion.

Theme	Description
<b>1. Social systems</b>	<ul style="list-style-type: none"> <li>• A wider collaborative network in the community and home for prevention, information, and follow-on care.</li> <li>• Systems to support all clinical and non-clinical workers, patient care providers, families, and patients.</li> </ul>
<b>2. Experience of service and environment</b>	<ul style="list-style-type: none"> <li>• Provide a positive experience that ensures the best treatment, empathy, and individual needs.</li> <li>• A personalised, tailored approach.</li> <li>• A clean, hygienic, and safe environment.</li> <li>• A place that eases the emotions of anxiety and stress.</li> <li>• A safe place to return to.</li> <li>• A place where staff enjoyed working.</li> </ul>
<b>3. Communication</b>	<ul style="list-style-type: none"> <li>• Patient being informed of their full procedural pathway and aftercare.</li> <li>• Understanding the risk and success of procedures.</li> <li>• Informed staff, teamwork, and well-maintained patient records system.</li> </ul>
<b>4. Efficiency</b>	<ul style="list-style-type: none"> <li>• Reducing waiting times and cancellations.</li> <li>• Embracing day procures without compromising care.</li> <li>• Achieving a balance between efficiency, experience, and throughput.</li> <li>• Reducing waiting times and cancellations.</li> </ul>

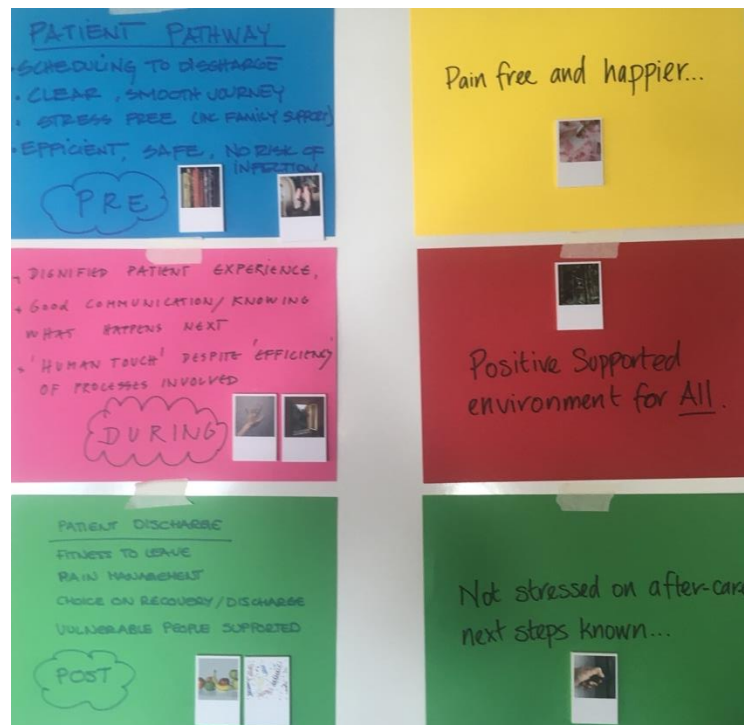


Figure 2: Workshop material, patient experience

### 3.4 Session 3: Design game outcomes

In different small groups of 5–6 participants instigated by the host, each team discussed, designed, and presented a concept of the ideal day surgery environment as follows:

Between groups, similar themes emerged for the built environment design: technology, adaptability, flexibility, change of service pathways, and efficiency.

Table 4: Concept Designs

<p><b>Group 1</b></p> <p>Key themes:</p> <ul style="list-style-type: none"> <li>• Technology</li> <li>• Awareness</li> <li>• Zoning</li> <li>• Appearance</li> </ul>	<ul style="list-style-type: none"> <li>• The facility consists of: 1) a light and flexible reception; 2) staff; and 3) patient recovery spaces. 2) changing and operating suite spaces; and 3) back-stage space for surgical props and equipment, creating a clean and clutter-free operating space.</li> <li>• Combined digital check-in services with traditional reception. result in a circular reception with surrounding cubicles or nooks for patients to be seen by doctors at different time slots.</li> <li>• Key drivers: flexibility and efficient use of the clinician's time.</li> </ul>
<p><b>Group 2</b></p> <p>Key themes:</p> <ul style="list-style-type: none"> <li>• Technology</li> <li>• Adaptable</li> <li>• Homecare</li> <li>• Staff Flexibility</li> </ul>	<ul style="list-style-type: none"> <li>• Create a series of nodes to embrace a fully integrated technological day surgery experience.</li> <li>• Concept based on a plug-and-play approach with variance of complexity based on need.</li> <li>• A fleet of autonomous vehicles with clinical services is transported to people's homes. Making ancillary spaces for day surgery obsolete.</li> <li>• This increase in flexibility required a huge number of mobile staff.</li> <li>• Patient access to information during all process stages.</li> </ul>
<p><b>Group 3</b></p> <p>Key themes:</p> <ul style="list-style-type: none"> <li>• Service change</li> <li>• Pathways</li> <li>• Efficiency</li> <li>• Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Service change to a 24/7 day surgery service facility.</li> <li>• Patient pathway included a specialist at each stage.</li> <li>• In identifying the complex and convoluted process of surgery, efficiency is suggested by reducing the number of specialists and staff seen per patient.</li> <li>• Embraced technology to create a one-stop-shop approach to reduce backlogs.</li> </ul>
<p><b>Group 4</b></p> <p>Key themes:</p> <ul style="list-style-type: none"> <li>• Service change</li> <li>• Hotel</li> <li>• Flexibility</li> <li>• Efficient use</li> </ul>	<ul style="list-style-type: none"> <li>• Past and future compared to implementing ideas</li> <li>• A new concept operating theatre suite and a hotel-centric approach to before and after care.</li> <li>• Surgery would take place in a mobile, self-contained industrial unit for ease of upgrade and transport.</li> <li>• Step-up and step-down facilities are suggested.</li> </ul>





Figure 3 and 4: Design game illustration

### 3.5 Ending discussion

In the closing remark, one of the important points made was the relative slowness of the building profession when compared to the medical and technological worlds in adapting to change. It was noted that healthcare buildings became obsolete just as they were built due to the rapid changes in equipment and medical technologies compared to the time taken to construct and occupy a new facility. Also, there is a lack of current, continuous development of design guidance to support the changing nature of healthcare facility design.



### 3.6 Results on methodology questionnaire

A total of 16 of 20 participants responded, with hosts excluded. The questionnaire included questions about:

- How the method was perceived, what went well, and what could be improved
- How collaboration worked
- Workshop output
- The potential of using this collaborative method again

A general response was positive, saying that the events were fun and enjoyable. Other views mentioned were:

- Very interesting conversation
- A wonderful spread of disciplines is represented.
- Good engagement and thought-provoking discussion

13 respondents (out of 16) agreed or strongly agreed that the workshop fostered interdisciplinary collaboration.

In relation to what could be improved, there was a general conclusion that the method met expectations and worked well. Some aspects regarding improvement were mentioned, including:

- Some notes on the room being too small and noises from the outside disturbing.
- Considerations on how this can be developed in relation to project delivery models: when UK client methodologies make it difficult to use this approach directly.
- More of a focus on needs rather than activity management.
- More detailed analysis of how day surgery designs, flows, and operations are done elsewhere, and lessons learned.
- More of the possible futures of surgical spaces.
- More in connection to the cost/lifetime analysis method.
- Workshop time management, which could be improved.

A suggestion of another workshop format, such as a 2-day workshop, would enable a better way of managing time, getting in-depth insights into each other's way of thinking, and a better setting for covering more aspects.

12 respondents were in agreement with "I learned something new." In response to the statement "The process should be used more often," 13 out of 16 answered that they were in agreement or strong agreement, and 14 answered agreement or strong agreement regarding whether they would use some of the applied methods in their studies or work.

## 4. Discussion

The research generated two sets of distinct results. The first provides a series of design options with key areas for consideration and discussion in rethinking the design and delivery of a particular healthcare service. The second is a critical review of the method by which the subject was investigated. This discussion focuses on the engagement technique of co-design.

Based on the methodology questionnaire, three key topics emerged for evaluation and discussion:

- Subjects and participants
- Choices and consequences of using the co-design methodology
- The type and character of outcomes

### 4.1 Subject and Participants

The workshop subject selection coincided with current UK government reviews of day surgery services, the request for improved activity turnaround, the reduction of patient waiting lists, and the need to improve staff satisfaction.

The selection of participants was driven by the responses to take part in the activity and the organiser's network of contacts. The network consisted of university educators, researchers, and professionals from professional industries including the NHS Trust, construction, architecture, and/or design practices. This alone defined the field of knowledge exchange. Patient insights were also limited to the dual roles of participants

since most had the experience of being a day surgery patient; however, the subjective opinions of the patient appeared to be clouded by their professional interests. To encourage diverse opinions, the smaller workshop groups consisted of different professionals, yet this was limited by the initial selection.

The conversation and discussions were mostly directed at spatial design due to the high number of built environment-related participants and the framing of the exercises. In hindsight, a balanced number of clinical practitioners, patient groups, and healthcare staff could have provided a broader knowledge and experience base. To encourage diversity in discussion, the workshop structure and questions remained open for interpretation and could have been relevant to a range of participants.

#### **4.2 Choices and consequences of using co-design methodology**

The project Bauhow 5 expresses that “this method allows the unfolding of a ‘wicked’ problem in a locally situated practice, adding knowledge to all participants in the process of codesigning possible answers or solutions to the problem” (Eriksson et al., 2020).

With this in mind, the workshop was organised to frame the subject in relation to physical space, using visual tools such as images and coloured shapes to visualise discussions and ideas. The purpose of the workshop and its tools was to facilitate new ways of thinking, cross-fertilising ideas, and bridging the possible knowledge asymmetry between people. The initial exercise focused on existing challenges to provoke debate. However, the main group session focused on identifying the future and ideal needs of a specific environment and service model by co-designing one or more shared answers or solutions.

Almost all participants considered that this was a methodology worth exploring more. This could be interpreted as an appreciation of the setup, but also that there was more to investigate than this day could encompass.

Although a well-studied methodology in other contexts and hence using established methods to facilitate shared understanding, interdisciplinary learning, and collaboration, co-design was a fairly new methodology for all participants.

The initial getting to know each other and preliminary discussion on the topic of interest were short, and longer sessions could have benefited. However, the constraints of a one-day workshop enforce short discussion and quick decision-making. The setup, with most of the time spent on group work and presentation, was intentional, with the focus on exchange between participants and not input from outside of the group, with the effect that some missed the learning from examples and common ground.

One of the critical factors was the time allowance for each session and the whole workshop. A two-day workshop was considered, yet this placed a strain on individuals due to their professional commitments. A series of workshops would allow time for reflection and the development of ideas that may have generated more in-depth thinking, and all participants, not just the vocal ones, would have had a chance to voice their opinions and thoughts.

#### **4.3 The type and character of outcomes**

The questionnaire revealed that most people left the workshop on a positive note, feeling that they did contribute to the discussion, learned something new, and had an interest in working with the method again. Still, there were some issues that were unsatisfactory. Time management was one such issue.

How well did the studied methodology work for generating new ideas? The outcome indicated that no new ideas or innovations emerged, but the ordering and organisation of thoughts improved, and clear, concise themes were identified. The awareness factor improved, and the activities clarified the issues of “what is usually said.” A vast majority agreed in the questionnaire that they learned something new during the event, although it was not mentioned in relation to what.

The issue of time vs. change of building use was raised in the ending discussion, pointing out how buildings are planned to house an organisation for many years, but the organisation being in constant change affected how the discussion about needs today and in the future is handled. Aspects of this were also mentioned in several discussions on flexibility, adaptability, and service change.

## 5. Conclusions

This paper sets out to present how the method of design dialogue could be applied in a different context, the type of knowledge this would generate, and the key topics—the subject, participants, choices, and consequences of using co-design methodology—that affected the outcomes.

The use of design dialogue as a method of letting a group of stakeholders in day surgery meet and pinpoint challenges with current facilities, as well as develop solutions, enabled the participants to step out of their everyday projects and look at their situation from new perspectives. Due to the method being new to most of the participants and offering a collaborative design approach different from what they may have been used to, it made people interested, along with an engaging and current topic.

The workshop setup and tools offered supported the sharing of perspectives, knowledge, and ideas within the small group as well as with the larger group in what could be described as cross-disciplinary learning. The visual tools enabled a joint discussion that could be shared with the whole group.

Being somewhat of a pilot project, there are, of course, refinements to be made in case this method is proposed in relation to an ongoing project. One aspect that needs to be studied further is what adjustments need to be made in relation to the UK project design phases and stakeholders, as pointed out in the questionnaire. Further aspects are to look into the duration of the event, the topics presented, and the consideration of representativity. Who attends the workshop plays a significant role in what perspectives get included in the discussion. Even if there were only one or a few representatives from clinical professions or artists, they still had to impact the discussion.

Although this workshop took place before COVID-19, day surgery has proven to be a vital service for many patients during the last two years. It has provided an efficient and safe care pathway by reducing the length of stay in hospital environments, providing a directional flow of patient throughput, and keeping routine operations to a minimum during a pandemic. Despite these worldly events, the workshop's outcome remains relevant.

## Acknowledgments

Partly funded by BauHow5 Alliance funded by Erasmus and programme of the European Union

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